

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN FOR NCDOT PROJECTS Version 2.08; Released April 2018) **WBS Element:** 37673.1.TA2 R-2721B TIP No.: County(ies): Wake Page of **General Project Information** WBS Element: 37673.1.TA2 TIP Number: R-2721B **Project Type: New Location** Date: 5/22/2018 **NCDOT Contact:** Ecological Engineering, LLP Stephen Morgan, P.E. Contractor / Designer: Address: NCDOT Hydraulics Unit Address: 1151 SE Cary Parkway 1020 Birch Ridge Dr. Suite 101 Raleigh, NC 27610 Cary, NC 27518 Phone: 919-707-6739 Phone: 919-557-0929 Email: smorgan@ncdot.gov Email: City/Town: Raleigh Wake County(ies): River Basin(s): CAMA County? Neuse No Wetlands within Project Limits? Yes **Project Description** Residential, Urban, Woods 4.9 Mi. Project Length (lin. miles or feet): Surrounding Land Use: **Proposed Project Existing Site** 21.7 252.3 Project Built-Upon Area (ac.) Typical Cross Section Description: Grassed median ditch with 8:1 sides slopes. 3 paved lanes with 12' paved shoulders New Location (total width of pavement is 124 feet). Outside grass roadway diches with 6:1 sides. Cut and fill slopes have a maximum 2:1 slope. Annual Avg Daily Traffic (veh/hr/day): Design/Future: 66.400 Year: 2040 Existing: 28,200 Year: 2018 General Project Narrative: The North Carolina Department of Transportation (NCDOT) has proposed to construct an extension of I-540 from NC 55 (Holly Springs) to US 401 (Fuquay-Varina). Below are (Description of Minimization of Water a list of minimization efforts associated with water quality impacts. Quality Impacts) 2:1 slopes are proposed within wetland areas where practical. • Toe protection is being installed in fill sections over wetland areas. • Energy dissipator pads and rip rap pads are being used near wetland areas to minimize the potential for erosion. • No staging of construction equipment or storage of construction supplies in jurisdictional wetlands or streams. Borrow and waste activities will occur outside of jurisdictional areas. Grass swales, median roadway ditches, and rip rap dissipater treatments have been used where feasible. Sediment and erosion control devices will follow the NCDOT protocol for Environmentally Sensitive Areas where required. EC devices will be installed as needed to promote stability and minimize sedimentation. · NCDOT is proposing to bridge multiple streams and wetlands to avoid and minimize impacts to jurisdictional features. **Waterbody Information** NCDWR Stream Index No.: 27-43-15-5 Surface Water Body (1): Camp Branch Primary Classification: Class C NCDWR Surface Water Classification for Water Body Supplemental Classification: Nutrient Sensitive Waters (NSW) Other Stream Classification: None Impairments: None Aquatic T&E Species? Comments: No SAJ NRTR Stream ID: Buffer Rules in Effect: Neuse Dissipator Pads Provided in Buffer? Project Includes Bridge Spanning Water Body? **Deck Drains Discharge Over Buffer?** N/A N/A No (If yes, provide justification in the General Project Narrative) (If yes, describe in the General Project Narrative; if no, justify in the N/A Deck Drains Discharge Over Water Body? General Project Narrative) (If yes, provide justification in the General Project Narrative)



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WBS Element: 37673.1.TA2	TIP No.:	R-2721B	County(ies):	Wake			Page	2	of 12	
			Additional Waterbo	dy Information						
Surface Water Body (2):		Middle	e Creek	NCDWR Stream In	dex No.:		27-43-15-(4)			
NCDWR Surface Water Classification for	or Water Body		Primary Classification:	Class (С					
NCDWR Surface Water Classification is	or water body		Supplemental Classification:	Nutrient Sensitive V	Vaters (NSW)					
Other Stream Classification:	No	ne								
Impairments:	No	ne								
Aquatic T&E Species?	No	Comments:								
NRTR Stream ID:	SPX					Buffer Rules in Effect:		1	Veuse	
Project Includes Bridge Spanning Water	r Body?	No	Deck Drains Discharge Over Bu		N/A	Dissipator Pads Provided			N/A	
Deck Drains Discharge Over Water Boo		N/A	(If yes, provide justification in	the General Project I	Narrative)	(If yes, describe in the Ge	•		ວ, justify in the	
(If yes, provide justification in the	General Project N	arrative)				Gene	eral Project Nar	rative)		
Surface Water Body (3):		Bells	Lake	NCDWR Stream In	dex No.:		27-43-15-6			
NCDWR Surface Water Classification for	or Water Body		Primary Classification:	Class (<u> </u>	
TODAY CUITAGO WATON CIACOMOLIGINA			Supplemental Classification:	Nutrient Sensitive V	Vaters (NSW)				<u> </u>	
Other Stream Classification:	No	ne							<u> </u>	
Impairments:	No	ne								
Aquatic T&E Species?	No	Comments:								
NRTR Stream ID:	SAS					Buffer Rules in Effect:		1	Neuse	
Project Includes Bridge Spanning Wate	r Body?	No	Deck Drains Discharge Over Bu		N/A	Dissipator Pads Provided			N/A	
Deck Drains Discharge Over Water Boo		N/A	(If yes, provide justification in	the General Project I	Narrative)	(If yes, describe in the Ge	•		ວ, justify in the	
(If yes, provide justification in the	General Project N	arrative)				Gen	eral Project Nar	rative)		
Surface Water Body (4):		Mills I	Branch	NCDWR Stream In	dex No.:		27-43-15-7			
NCDWR Surface Water Classification for	or Water Body		Primary Classification:	Class (4	
			Supplemental Classification:	Nutrient Sensitive V	Vaters (NSW)				4	
Other Stream Classification:	No								4	
Impairments:	No									
Aquatic T&E Species?	No	Comments:								
NRTR Stream ID:	SBM	1			1	Buffer Rules in Effect:		١	Veuse	
Project Includes Bridge Spanning Water		No	Deck Drains Discharge Over Bu		N/A	Dissipator Pads Provided			N/A	
Deck Drains Discharge Over Water Boo	•	N/A	(If yes, provide justification in	the General Project I	Narrative)	(If yes, describe in the Ge			ວ, justify in the	
(If yes, provide justification in the	General Project N	arrative)				Gene	eral Project Nar	rauve)		
				<u> </u>		T.				
Surface Water Body (5):			T.	NCDWR Stream In	dex No.:					
NCDWR Surface Water Classification for	or Water Body		Primary Classification:						4	
			Supplemental Classification:						4	
Other Stream Classification:									4	
Impairments:		_								
Aquatic T&E Species?		Comments:				I				
NRTR Stream ID:						Buffer Rules in Effect:		1	Veuse	
Project Includes Bridge Spanning Water			Deck Drains Discharge Over Bu			Dissipator Pads Provided			1 115 1 11	
Deck Drains Discharge Over Water Boo			(If yes, provide justification in	tne General Project I	Narrative)					
(If yes, provide justification in the	General Project N	arrative)				General Project Narrative)				



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55 **Additional Comments** 1.14%

1.8

2.3

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1.8

No

No



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							Swales								
Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Base Width (ft)	Front Slope (H:1)	Back Slope (H:1)	Drainage Area (ac)	Recommended Treatm't Length (ft)	Actual Length (ft)	Longitudinal Slope (%)	Q2 (cfs)	V2 (fps)	Q10 (cfs)	V10 (fps)	Rock Checks Used	BMP Associated w/ Buffer Rules?
23	274+50 -L- RT 277+00 -L- RT	(1)Camp Branch	0.0	6.0	2.0	0.6	60	250	0.34%	1.8	1.1	2.3	1.2	No	No
23	277+00 -L- RT 279+00 -L- RT	(1)Camp Branch	0.0	6.0	2.0	0.4	40	200	0.30%	1.2	1.0	1.5	1.0	No	No
23	277+00 -L- M 279+95 -L- M	(1)Camp Branch	0.0	8.0	6.0	0.7	65	295	0.30%	2.1	1.0	2.7	1.0	No	No
24	279+95 -L- M 282+00 -L- M	(1)Camp Branch	0.0	8.0	6.0	0.3	30	205	0.30%	0.9	0.8	1.2	0.9	No	No
24	284+50 -L- LT 289+50 -L- LT	(1)Camp Branch	0.0	6.0	6.0	1.0	100	500	1.75%	3.0	2.2	4.0	2.3	No	No
24	284+50 -L- RT 289+50 -L- RT	(1)Camp Branch	0.0	6.0	6.0	1.0	100	500	1.75%	3.0	2.2	4.0	2.3	No	No
24	284+50 -L- M 289+50 -L- M	(1)Camp Branch	0.0	8.0	8.0	1.1	110	500	1.75%	3.3	2.1	4.2	2.2	No	No
24	289+50 -L- LT 293+00 -L- LT	(1)Camp Branch	0.0	6.0	3.0	0.9	90	350	2.70%	2.7	2.6	3.5	2.8	No	No
24	289+50 -L- RT 293+00 -L- RT	(1)Camp Branch	0.0	6.0	3.0	0.6	60	350	2.70%	1.8	1.8	2.2	1.9	No	No
24	289+50 -L- M 293+00 -L- M	(1)Camp Branch	0.0	8.0	8.0	1.2	120	350	2.70%	3.6	2.5	4.8	2.7	No	No
26	305+50 -L- LT 307+50 -L- LT	(3)Bells Lake	0.0	20.0	3.0	0.3	30	200	1.10%	0.9	1.1	1.3	1.3	No	No
26	305+50 -L- LT 307+50 -L- LT	(3)Bells Lake	0.0	10.0	20.0	0.4	40	200	1.10%	1.2	1.1	1.5	1.2	No	No
26	305+50 -L- LT 308+50 -L- LT	(3)Bells Lake	0.0	6.0	6.0	0.7	70	300	0.30%	2.1	1.9	2.7	2.0	No	No
26	308+50 -L- LT 310+50 -L- LT	(3)Bells Lake	0.0	6.0	6.0	0.5	50	200	0.30%	1.5	1.8	1.9	1.9	No	No
26	307+50 -L- M 309+40 -L- M	(3)Bells Lake	0.0	8.0	8.0	0.5	45	190	1.39%	1.5	1.6	1.7	1.7	No	No
26	305+45 -L- RT 310+00 -L- RT	(3)Bells Lake	0.0	6.0	6.0	0.9	90	455	1.39%	2.7	1.8	3.4	1.9	No	No
27	310+50 -L- M 316+25 -L- M	(3)Bells Lake	0.0	8.0	8.0	1.2	120	625	1.39%	3.6	1.9	4.5	2.0	No	No
27	316+25 -L- M 318+00 -L- M	(3)Bells Lake	0.0	8.0	8.0	0.4	40	175	1.39%	1.2	1.5	1.4	1.5	No	No
27	318+00 -L- M 322+00 -L- M	(3)Bells Lake	0.0	8.0	8.0	0.8	80	400	1.39%	2.4	1.7	3.2	1.8	No	No



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							Swales								
Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Base Width (ft)	Front Slope (H:1)	Back Slope (H:1)	Drainage Area (ac)	Recommended Treatm't Length (ft)	Actual Length (ft)	Longitudinal Slope (%)	Q2 (cfs)	V2 (fps)	Q10 (cfs)	V10 (fps)	Rock Checks Used	BMP Associated w/ Buffer Rules?
27	322+00 -L- M 325+50 -L- M	(3)Bells Lake	0.0	8.0	8.0	0.7	70	350	1.39%	2.1	1.0	2.9	0.9	No	No
28	325+50 -L- M 329+50 -L- M	(3)Bells Lake	0.0	8.0	8.0	1.0	100	400	0.97%	3.0	1.6	3.8	1.7	No	No
28	329+50 -L- M 332+02 -L- M	(3)Bells Lake	0.0	8.0	8.0	0.5	45	252	0.30%	1.5	0.9	1.9	0.9	No	No
28	332+02 -L- M 333+65 -L- M	(3)Bells Lake	0.0	8.0	8.0	0.5	50	163	0.30%	1.5	0.9	1.9	0.9	No	No
28	333+65 -L- M 337+64 -L- m	(3)Bells Lake	0.0	8.0	6.0	0.5	50	399	0.53%	1.5	1.1	1.8	1.2	No	No
28	335+00 -L- LT 337+64 -L- LT	(3)Bells Lake	0.0	20.0	20.0	0.6	60	264	0.53%	1.8	0.9	2.2	1.0	No	No
28	334+50 -L- RT 337+67 -L- RT	(3)Bells Lake	0.0	12.0	3.0	0.6	60	317	0.53%	1.8	1.1	2.2	1.2	No	No
29	355+00 -L- M 359+00 -L- M	(2)Middle Creek	0.0	8.0	8.0	0.8	80	400	0.51%	2.4	1.2	2.9	1.3	No	No
29	355+00 -L- LT 359+00 -L- LT	(2)Middle Creek	0.0	6.0	3.0	1.9	190	400	0.51%	5.7	1.7	7.3	1.8	No	No
29	355+00 -L- RT 359+00 -L- RT	(2)Middle Creek	0.0	6.0	3.0	1.5	150	400	0.51%	4.5	1.6	5.8	1.7	No	No
29	359+00 -L- M 361+00 -L- M	(2)Middle Creek	0.0	8.0	8.0	0.5	50	200	0.51%	1.5	0.9	1.9	0.9	No	No
29	359+00 -L- RT 361+00 -L- RT	(2)Middle Creek	0.0	6.0	3.0	0.3	30	200	0.51%	0.9	1.0	1.2	1.1	No	No
29	361+00 -L- M 363+50 -L- M	(2)Middle Creek	0.0	8.0	8.0	0.6	60	250	0.51%	1.5	0.9	1.9	1.0	No	No
29	363+50 -L- M 364+50 -L- M	(2)Middle Creek	0.0	8.0	8.0	0.2	20	100	0.51%	0.6	0.8	0.8	0.9	No	No
29	364+50 -L- M 367+00 -L- M	(2)Middle Creek	0.0	8.0	8.0	0.5	50	250	0.39%	1.5	1.0	2.0	1.0	No	No
30	367+00 -L- M 368+09 -L- M	(2)Middle Creek	0.0	8.0	8.0	0.2	20	109	0.30%	0.6	0.7	0.8	0.7	No	No
30	368+09 -L- M 369+00 -L- M	(2)Middle Creek	0.0	8.0	8.0	0.2	20	91	0.30%	0.6	0.7	0.8	0.7	No	No
29, 30	367+37 -L- LT 369+00 -L- LT	(2)Middle Creek	0.0	6.0	2.0	0.3	30	163	0.30%	0.9	1.0	1.2	1.1	No	No
30	369+00 -L- LT 372+70 -L- LT	(2)Middle Creek	0.0	6.0	2.0	0.7	70	370	0.32%	2.1	1.1	2.7	1.2	No	No



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							Swales								
Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Base Width (ft)	Front Slope (H:1)	Back Slope (H:1)	Drainage Area (ac)	Recommended Treatm't Length (ft)	Actual Length (ft)	Longitudinal Slope (%)	Q2 (cfs)	V2 (fps)	Q10 (cfs)	V10 (fps)	Rock Checks Used	BMP Associated w/ Buffer Rules?
30	369+00 -L- M 373+75 -L- M	(2)Middle Creek	0.0	8.0	8.0	0.6	60	475	0.32%	1.8	1.0	2.3	1.1	No	No
30	370+00 -L- RT 373+75 -L- RT	(2)Middle Creek	0.0	18.0	18.0	0.4	40	375	0.68%	1.2	0.9	1.4	1.0	No	No
30	370+00 -L- RT 371+50 -L- RT	(2)Middle Creek	0.0	6.0	6.0	0.2	20	150	0.68%	0.6	1.0	0.8	1.1	No	No
30	371+50 -L- RT 374+30 -L- RT	(2)Middle Creek	0.0	6.0	6.0	0.3	30	280	1.20%	0.9	1.4	1.2	1.5	No	No
30	373+75 -L- LT 377+50 -L- LT	(2)Middle Creek	0.0	18.0	2.0	0.8	80	375	1.26%	2.4	1.6	3.2	1.7	No	No
30	373+75 -L- RT 377+50 -L- RT	(2)Middle Creek	0.0	4.0	18.0	0.5	50	375	1.26%	1.5	1.4	2.0	1.5	No	No
30	374+30 -L- RT 377+00 -L- RT	(2)Middle Creek	0.0	18.0	2.0	0.2	20	270	1.26%	0.6	1.2	0.8	1.3	No	No
30	377+50 -L- LT 381+00 -L- LT	(2)Middle Creek	0.0	6.0	2.0	0.8	80	350	1.26%	2.4	2.0	2.9	2.1	No	No
30	376+42 -L- M 377+50 -L- M	(2)Middle Creek	0.0	8.0	8.0	0.2	20	108	0.30%	0.6	0.7	0.8	0.8	No	No
30	377+50 -L- M 379+00 -L- M	(2)Middle Creek	0.0	8.0	8.0	0.6	60	150	0.30%	1.8	0.9	2.3	1.0	No	No
30	375+50 -L-RT 377+00 -L- RT	(2)Middle Creek	0.0	6.0	2.2	0.4	40	150	0.30%	1.3	1.0	1.5	1.1	No	No
30	377+00 -L- RT 379+00 -L- RT	(2)Middle Creek	0.0	6.0	2.2	0.4	40	200	0.30%	1.3	1.0	1.5	1.1	No	No
28, 57	36+00 -Y8- 41+50 -Y8-	(3)Bells Lake	0.0	6.0	2.0	1.2	120	550	0.30%	3.6	1.3	4.6	1.4	No	No
31	379+00 -L- M 383+50 -L- M	(2)Middle Creek	0.0	8.0	8.0	0.6	60	450	1.26%	1.8	1.6	2.9	1.8	No	No
31	379+00 -L- RT 381+20 -L- RT	(2)Middle Creek	0.0	6.0	4.0	0.4	40	220	1.26%	1.1	1.5	1.4	1.6	No	No
31	381+20 -L- RT 381+50 -L- RT	(2)Middle Creek	0.0	6.0	4.0	0.4	40	30	1.26%	1.2	1.6	1.6	1.7	No	No
31	381+50 -L- LT 384+50 -L- LT	(2)Middle Creek	0.0	6.0	3.0	0.5	48	300	0.30%	1.1	0.9	1.4	1.0	No	
31	389+50 -L- M 395+50 -L- M	(2)Middle Creek	0.0	8.0	5.3	1.3	130	600	0.50%	3.6	1.4	4.6	1.5		
31	389+50 -L- RT 391+00 -L- RT	(2)Middle Creek	0.0	6.0	4.0	0.4	41	150	0.50%	1.1	1.0	1.5	1.1		
							additional Common								



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Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Base Width (ft)	Front Slope (H:1)	Back Slope (H:1)	Drainage Area (ac)	Recommended Treatm't Length (ft)	Actual Length (ft)	Longitudinal Slope (%)	Q2 (cfs)	V2 (fps)	Q10 (cfs)	V10 (fps)	Rock Checks Used	BMP Associated w/ Buffer Rules?
31	391+00 -L- RT 398+00 -L- RT	(2)Middle Creek	0.0	6.0	4.0	2.4	235	700	0.50%	5.4	1.6	7.0	1.7		
31	391+00 -L- RT 394+50 -L- RT	(2)Middle Creek	0.0	3.0	3.0	2.0	200	350	1.76%	4.7	2.8	6.0	3.0		
31	392+50 -L- LT 394+00 -L- LT	(2)Middle Creek	0.0	6.0	3.0	0.2	15	150	0.50%	0.3	0.8	0.4	0.9		
31	394+00 -L- LT 395+50 -L-LT	(2)Middle Creek	0.0	6.0	4.0	0.2	20	150	0.50%	0.5	0.9	0.6	0.9		
32	395+50 -L- LT 401+50 -L- LT	(2)Middle Creek	0.0	6.0	4.0	1.1	106	600	0.47%	2.4	1.3	2.9	1.4		
32	395+50 -L- M 397+50 -L- M	(2)Middle Creek	0.0	8.0	5.3	0.4	44	200	0.47%	1.0	1.0	1.3	1.0		
32	397+50 -L- M 399+00 -L- M	(2)Middle Creek	0.0	8.0	5.3	0.4	36	150	0.26%	1.1	0.4	1.4	0.5		
32	399+00 -L- M 400+00 -L-M	(2)Middle Creek	0.0	20.0	15.0	0.2	16	100	0.10%	0.5	0.2	0.6	0.2		
32	400+00 -L-M 401+00 -L- M	(2)Middle Creek	0.0	20.0	4.3	0.2	18	100	0.11%	0.5	0.3	0.7	0.5		
32	394+50 -L- RT 398+00 -L- RT	(2)Middle Creek	0.0	3.0	3.0	1.4	135	350	0.30%	3.5	1.3	4.5	1.4		
32	398+00 -L- RT 400+75 -L- RT	(2)Middle Creek	0.0	3.0	3.0	1.0	100	275	1.80%	2.5	2.4	3.2	2.6		
32	401+00 -L- M 403+50 -L- M	(2)Middle Creek	0.0	20.0	5.0	0.3	30	250	0.38%	1.1	0.8	1.4	0.8		
32	402+00 -L- RT 403+50 -L- RT	(2)Middle Creek	0.0	20.0	3.0	0.7	70	150	0.38%	2.4	1.0	3.0	1.0		
32	403+50 -L- RT 406+00 -L- RT	(2)Middle Creek (2)Middle	0.0	6.0	4.0	0.9	86	250	0.51%	2.0	1.3	2.5	1.4		
33	406+00 -L- RT 408+00 -L- RT	Creek	0.0	6.0	4.0	0.5	54	200	0.51%	1.2	1.1	1.6	1.2		
33	403+50 -L- M 408+00 -L- M	(2)Middle Creek (2)Middle	0.0	8.0	5.3	1.0	98	450	0.51%	2.9	1.3	3.7	1.4		
33	408+00 -L- M 412+50 -L- M	Creek	0.0	8.0	5.7	1.0	98	450	0.51%	2.9	1.3	3.8	1.4		
33	412+50 -L- M 416+00 -L- M	(2)Middle Creek	0.0	8.0	7.2	0.8	77	350	0.51%	2.3	1.2	2.9	1.3		
33	416+00 -L- M 418+10 -L- M	(2)Middle Creek	0.0	8.0	7.7	0.8	78	210	0.30%	2.3	1.0	3.0	1.0		



Highway Stormwater Program STORMWATER MANAGEMENT PLAN

474+00 -L- LT

Branch

FOR NCDOT PROJECTS (Version 2.08; Released April 2018) **WBS Element:** 37673.1.TA2 **TIP No.:** R-2721B County(ies): Wake Page 8 of 12 **Swales Station & Coordinates** Surface Base Front Back Drainage Recommended Actual Longitudinal Rock **BMP** Q2 **V2 Sheet** (Road and Non Road Width Slope Treatm't Length Length Q10 V10 Checks | Associated w/ Water Slope Area Slope (H:1) (H:1) (ft) (%) (cfs) Used **Buffer Rules?** No. Projects) Body (ft) (ac) (ft) (fps) (cfs) (fps) 418+10 -L- M 2)Middle 155 3.6 0.0 7.7 8.0 0.9 88 0.50% 1.1 4.7 1.2 419+65 -L- M Creek 419+65 -L- M 2)Middle 33 7.0 8.0 93 1.10% 1.7 3.6 1.8 423+70 -L- M Creek (4)Mills 423+70 -L- M 34 0.0 6.6 8.0 88 430 1.03% 2.6 1.6 3.4 1.7 0.9 428+00 -L- M Branch (4)Mills 428+00 -L- M 35 0.0 7.6 8.0 0.4 42 600 0.48% 1.2 1.0 1.6 1.1 434+00 -L- M Branch (4)Mills 437+00 -L- M 35 0.0 6.6 122 350 3.6 4.7 2.1 8.0 1.2 1.43% 2.0 440+50 -L- M Branch 440+50 -L- M (4)Mills 0.0 8.0 2.6 8.0 0.7 70 325 1.43% 1.7 1.8 443+75 -L- M Branch 443+75 -L- M (4)Mills 36 0.0 8.0 8.0 0.5 50 247 1.43% 1.5 1.6 1.8 1.6 446+22 -L- M Branch 446+22 -L- M 36 0.0 8.0 8.0 1.5 150 703 1.43% 4.5 2.1 5.8 2.2 453+25 -L- M Branch 453+25 -L- M 36 0.0 8.0 8.0 1.3 130 575 1.43% 3.9 2.0 5.1 2.1 459+00 -L- M Branch 457+04 -L- LT 37 4.0 1.8 180 696 2.38% 2.6 6.8 2.8 4.0 5.4 464+00 -L- LT Branch 459+00 -L- M (4)Mills 37 8.0 1.4 140 1.43% 4.2 2.0 5.4 2.2 465+00 -L- M Branch 464+00 -L- LT (4)Mills 37 0.0 4.0 4.0 0.9 90 152 2.38% 2.7 2.6 3.4 2.7 465+52 -L- LT Branch (4)Mills 466+50 -L- LT 37 6.0 3.1 1.1 350 1.43% 3.3 2.2 4.4 2.3 0.0 110 470+00 -L- LT Branch 465+00 -L- M (4)Mills 37 2.8 0.0 8.0 8.0 1.1 110 500 1.43% 1.8 3.5 1.9 470+00 -L- M Branch 464+73 -L- RT (4)Mills 0.0 4.0 0.7 70 1.43% 1.8 1.8 2.4 2.0 470+00 -L- RT Branch 470+00 -L- RT (4)Mills 37 130 1.43% 3.0 2.1 2.2 0.0 6.0 4.0 1.3 303 3.8 Branch 473+03 -L- RT 470+00 -L- M (4)Mills 37 0.0 9.8 9.8 0.7 70 237 1.43% 1.8 1.6 2.4 1.7 472+37 -L- M Branch (4)Mills 470+00 -L- LT 37 2.3 0.0 6.0 4.0 0.9 90 240 1.43% 2.0 2.9 2.1 472+40 -L- LT Branch 472+40 -L- LT (4)Mills 0.0 70 1.43% 1.8 1.8 2.3 2.0







Highway Stormwater Program STORMWATER MANAGEMENT PLAN



(Version 2.08; Released April 2018)

FOR NCDOT PROJECTS **WBS Element:** 37673.1.TA2 **TIP No.:** R-2721B 12 County(ies): Wake Page 9 of **Swales** Drainage **Station & Coordinates** Front **Back** Recommended Actual Longitudinal Rock **BMP** Surface Base Sheet (Road and Non Road Water Width Slope Slope Area Treatm't Length Length Slope Q2 **V2** Q10 V10 Checks Associated w/ (H:1) Used **Buffer Rules?** No. Projects) (ft) (H:1) (ft) (ft) (%) (cfs) (fps) (cfs) (fps) Body (ac) 474+00 -L- LT 2.3 0.0 25.0 0.9 90 135 1.43% 1.5 2.9 3.0 1.6 475+35 -L- LT Branch 472+37 -L- M (4)Mills 37 0.7 0.0 25.0 8.8 0.2 20 213 1.43% 1.1 0.7 1.1 474+50 -L- M Branch (4)Mills 474+50 -L- M 37 0.0 20 1.43% 0.6 0.6 25.0 4.9 0.2 100 1.1 1.1 475+50 -L- M Branch (4)Mills 14+30 -Y13LPC- LT 37 0.0 25.0 3.0 0.7 70 210 0.30% 1.8 8.0 2.3 0.9 475+50 -L- RT Branch (4)Mills 475+50 -L- M 37 0.0 25.0 4.6 0.3 30 300 1.43% 1.0 1.2 1.3 1.3 478+50 -L- M Branch 478+50 -L- M (4)Mills 37 0.8 0.0 25.0 7.8 0.2 20 100 1.43% 0.7 1.1 1.1 479+50 -L- M Branch 478+10 -L- RT (4)Mills 37 0.0 0.4 40 190 1.43% 1.3 1.7 6.0 4.0 1.0 1.6 480+00 -L- RT Branch 479+50 -L- M 37 0.0 12.5 12.5 0.5 50 200 1.12% 1.4 1.3 1.7 1.3 481+50 -L- M Branch 481+50 -L- M 0.0 37 8.0 8.0 1.3 130 550 0.30% 4.0 1.1 5.1 1.2 483+69 -L- M Branch 480+00 -L- RT 4)Mills 37 50 0.5 0.50% 1.1 1.6 1.2 482+50 -L- RT Branch 482+50 -L- RT (4)Mills 37 0.0 6.0 4.0 0.5 50 119 0.30% 1.5 1.0 2.0 1.0 483+69 -L- RT Branch 482+50 -L- LT (4)Mills 37 0.0 6.0 4.0 1.5 150 450 0.30% 4.4 1.3 5.6 1.4 483+69 -L- LT Branch (4)Mills 487+00-L- M 37 0.0 8.0 8.0 1.5 150 600 1.38% 4.4 2.0 5.6 2.2 493+00 -L- M Branch 493+00 -L- M (4)Mills 38 0.0 8.0 8.0 1.1 110 523 2.23% 3.3 2.3 3.6 2.3 498+23 -L- M Branch 493+00 -L- RT (4)Mills 38 0.0 4.1 4.1 0.5 50 500 1.62% 1.6 2.0 2.1 2.1 498+00 -L- RT Branch 498+23 -L- M (4)Mills 50 38 0.0 8.0 8.0 0.5 177 0.95% 1.2 1.3 1.5 1.3 500+00 -L- M Branch 498+00 -L- RT (4)Mills 38 0.0 4.0 20 0.95% 0.7 4.0 0.2 200 1.3 0.9 1.4 500+00 -L- RT Branch 26+00 -Y13RPB- RT (4)Mills 37 0.0 6.0 4.0 0.5 50 250 0.96% 0.9 1.3 1.2 1.4 28+50 -Y13RPB- RT Branch 28+50 -Y13RPB- RT 4)Mills 37 0.0 6.0 4.0 1.7 170 1.80% 4.2 2.5 5.4 2.6

Additional Comments



32+00 -Y13RPB- RT

Branch



		STORMWATER MANAGEMENT PLAN				WINT OF TRANSPORT
(Version 2.08; Released April 2018)		FOR NCDOT PROJECTS				
WBS Element: 37673.1.TA2	TIP No.: R-2721B	County(ies): Wake	Page	10	of	12

	Swales														12
Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Base Width (ft)	Front Slope (H:1)	Back Slope (H:1)	Drainage Area (ac)	Recommended Treatm't Length (ft)	Actual Length (ft)	Longitudinal Slope (%)	Q2 (cfs)	V2 (fps)	Q10 (cfs)	V10 (fps)	Rock Checks Used	BMP Associated w/ Buffer Rules?
37	32+00 -Y13RPB- RT 35+90 -Y13RPB- RT	(4)Mills Branch	0.0	6.0	4.0	1.7	170	390	2.00%	4.3	2.6	5.5	2.8		
37	21+58 -Y13RPC- LT 23+50 -Y13RPC- LT	(4)Mills Branch	0.0	6.0	4.0	1.5	150	300	0.76%	3.7	1.7	4.7	1.8		
37	23+50 -Y13RPC- LT 26+60 -Y13RPC- LT	(4)Mills Branch	0.0	6.0	4.0	0.6	60	310	0.76%	1.5	1.4	2.0	1.5		
37	29+50 -Y13RPC- LT 30+70 -Y13RPC- LT	(4)Mills Branch	0.0	6.0	6.0	0.2	20	120	2.00%	0.7	1.6	0.8	1.6		
37	12+10 -Y13LPC- LT 17+50 -Y13LPC- LT	(4)Mills Branch	0.0	3.0	3.0	1.2	120	540	2.00%	2.7	2.6	3.4	2.7		
37	17+50 -Y13LPC- LT 20+90 -Y13LPC- LT	(4)Mills Branch	0.0	3.0	3.0	1.2	120	340	2.00%	2.7	2.6	3.4	2.7		
37	21+70 -Y13LPC- RT 23+20 -Y13LPC- RT	(4)Mills Branch	0.0	6.0	6.0	0.2	20	150	2.00%	0.7	1.6	0.8	1.6		
37	34+00 -Y13RPD- LT 36+50 -Y13RPD- LT	(4)Mills Branch	0.0	6.0	6.0	0.4	40	250	2.96%	1.2	2.1	1.6	2.2		
37	36+50 -Y13RPD- LT 38+00 -Y13RPD- LT	(4)Mills Branch	0.0	6.0	6.0	0.2	20	150	2.70%	0.7	1.8	0.9	1.9		
37	36+50 -Y13RPD- RT 40+62 -Y13RPD- RT	(4)Mills Branch	0.0	6.0	4.3	1.3	130	412	1.91%	4.1	2.5	5.3	2.7		
37	16+34 -Y13RPA- LT 18+48 -Y13RPA- LT	(4)Mills Branch	0.0	4.0	4.0	1.8	180	214	1.58%	4.5	2.5	5.7	2.7		
37	19+50 -Y13RPA- LT 22+50 -Y13RPA- LT	(4)Mills Branch	0.0	6.0	4.0	0.4	40	300	1.58%	1.1	1.7	1.4	1.8		
37	21+00 -Y13RPA- RT 26+00 -Y13RPA- RT	(4)Mills Branch	0.0	6.0	4.0	1.2	120	500	1.64%	3.5	2.3	4.4	2.4		
37	22+50 -Y13RPA- LT 26+00 -Y13RPA- LT	(4)Mills Branch (4)Mills	0.0	6.0	4.0	0.6	60	350	3.87%	1.5	2.5	2.0	2.7		
37	26+00 -Y13RPA- RT 28+50 -Y13RPA- RT	Branch	0.0	6.0	6.0	0.4	40	250	4.98%	0.9	2.4	1.1	2.5		
37	28+50 -Y13RPA- RT 29+70 -Y13RPA- RT	(4)Mills Branch	0.0	6.0	4.3	0.1	10	120	4.98%	0.4	2.0	0.5	2.1		
37	479+00 -L- LT 480+00 -L- LT	(4)Mills Branch	0.0	11.8	3.0	0.8	80	100	2.00%	1.2	1.7	1.5	1.8		
37	475+37 -L- LT 479+00 -L- LT	(4)Mills Branch	0.0	25.0	3.0	0.8	80	363	1.43%	2.6	1.6	3.4	1.7		
62	29+50 -Y13- LT 31+50 -Y13- LT	(4)Mills Branch	0.0	6.0	3.0	0.4	40	200	5.20%	1.1	2.7	1.4	2.9		





(Version 2.	STORMWATER MANAGEMENT PLAN (Version 2.08; Released April 2018) FOR NCDOT PROJECTS														
	WBS Element:	: 37673.1.TA2	TIP No.:	: R-2721B		County(ies):	Wake					Page	11	of	12
							Swales								
Sheet No.	Station & Coordinates (Road and Non Road	Surface Water Body	Base Width	Front Slope	Back Slope	Drainage Area	Recommended Treatm't Length	Actual Length	Longitudinal Slope	Q2	V2	Q10	V10	Rock Checks Used	BMP Associated w/ Buffer Rules?
	Projects) 29+98 -Y13- RT	(4)Mills	(ft)	(H:1)	(H:1)	(ac)	(ft)	(ft)	(%)	(cfs)	(fps)	(cfs)	(fps)	Usea	Buller Rules?
62	30+50 -Y13- RT	Branch	0.0	6.0	4.0	0.5	50	52	3.66%	1.7	2.6	2.2	2.7		
62	32+00 -Y13- LT 34+00 -Y13- LT	(4)Mills Branch	0.0	6.0	6.0	0.3	30	200	5.24%	0.9	2.4	1.2	2.6		
62	32+35 -Y13- LT	(4)Mills	0.0	6.0	6.0	0.6	60	141	5.24%	1.7	2.8	2.1	3.0		
02	33+76 -Y13- LT	Branch	0.0	0.0	0.0	0.0	00	141	3.2470	1.7	2.0	2.1	3.0		
62	36+00 -Y13- RT	(4)Mills	0.0	6.0	4.0	0.7	70	270	3.42%	2.4	2.7	3.1	2.9		
	11+00 -Y13F- RT	Branch	0.0	0.0		0			01.1275			0			
63	39+45 -Y13- RT	(4)Mills	0.0	6.0	3.0	0.6	60	155	0.75%	1.6	1.4	2.0	1.5		
	41+00 -Y13- RT 41+00 -Y13- RT	Branch (4)Mills													
63	42+17 -Y13- RT	Branch	0.0	6.0	3.0	1.1	110	287	0.30%	2.7	1.2	3.5	1.2		
	43+88 -Y13- RT	(4)Mills													
63	49+00 -Y13- RT	Branch	0.0	6.0	4.0	1.2	120	522	1.70%	3.6	2.3	4.6	2.5		
27	58+00 -Y13- LT	(4)Mills	0.0	6.0	4.0	0.7	70	226	0.90%	2.5	1.7	2.2	1.8		
37	60+26 -Y13- LT	Branch	0.0	6.0	4.0	0.7	70	226	0.90%	2.5	1.7	3.3	1.8		
64	65+38 -Y13- RT	(4)Mills	0.0	6.0	6.0	0.5	50	376	0.30%	1.7	1.0	2.2	1.0		
01	69+14 -Y13- RT	Branch	0.0	0.0	0.0	0.0	00		0.0070	1.7	1.0	2.2	1.0		
64	67+00 -Y13- LT	(4)Mills	0.0	6.0	4.0	0.8	80	200	0.30%	2.0	1.0	2.5	1.1		
	69+00 -Y13- LT	Branch													
64	69+65 -Y13- LT 72+05 -Y13- LT	(4)Mills Branch	0.0	6.0	4.0	1.8	180	250	0.73%	5.3	1.9	6.8	2.0		
	72+05 - Y13- LT	(4)Mills													
64	75+27 -Y13- LT	Branch	0.0	6.0	4.0	2.4	240	322	2.56%	7.2	3.2	9.3	3.4		
0.4	69+71 -Y13- RT	(4)Mills	0.0	0.0	0.0	0.7	70	070	4.500/	4.0	4.0	0.5	0.0		
64	72+50 -Y13- RT	Branch	0.0	6.0	6.0	0.7	70	279	1.59%	1.9	1.9	2.5	2.0		
65	21+50 -Y13A- RT	(4)Mills	0.0	4.0	3.0	0.4	40	186	2.42%	1.1	2.1	1.4	2.3		
- 00	23+36 -Y13A- RT	Branch	0.0	4.0	0.0	0.4	-10	100	2.1270		2.1	1	2.0		
65	21+50 -Y13A- LT 23+36 -Y13A- LT	(4)Mills Branch	0.0	4.0	3.0	0.2	20	186	2.42%	0.4	1.7	0.5	1.8		
34	24+50 -Y12A- RT 26+00 -Y12A- RT	(4)Mills Branch	0.0	4.0	3.0	0.4	40	150	2.00%	1.0	1.9	1.3	2.1		
35	17+25 -Y12- LT 18+30 -Y12- LT	(4)Mills Branch	0.0	6.0	2.0	0.4	40	105	0.30%	1.1	0.9	1.4	1.0		
		-													



Highway Stormwater Program STORMWATER MANAGEMENT PLAN



(Version 2.08; Released April 2018)

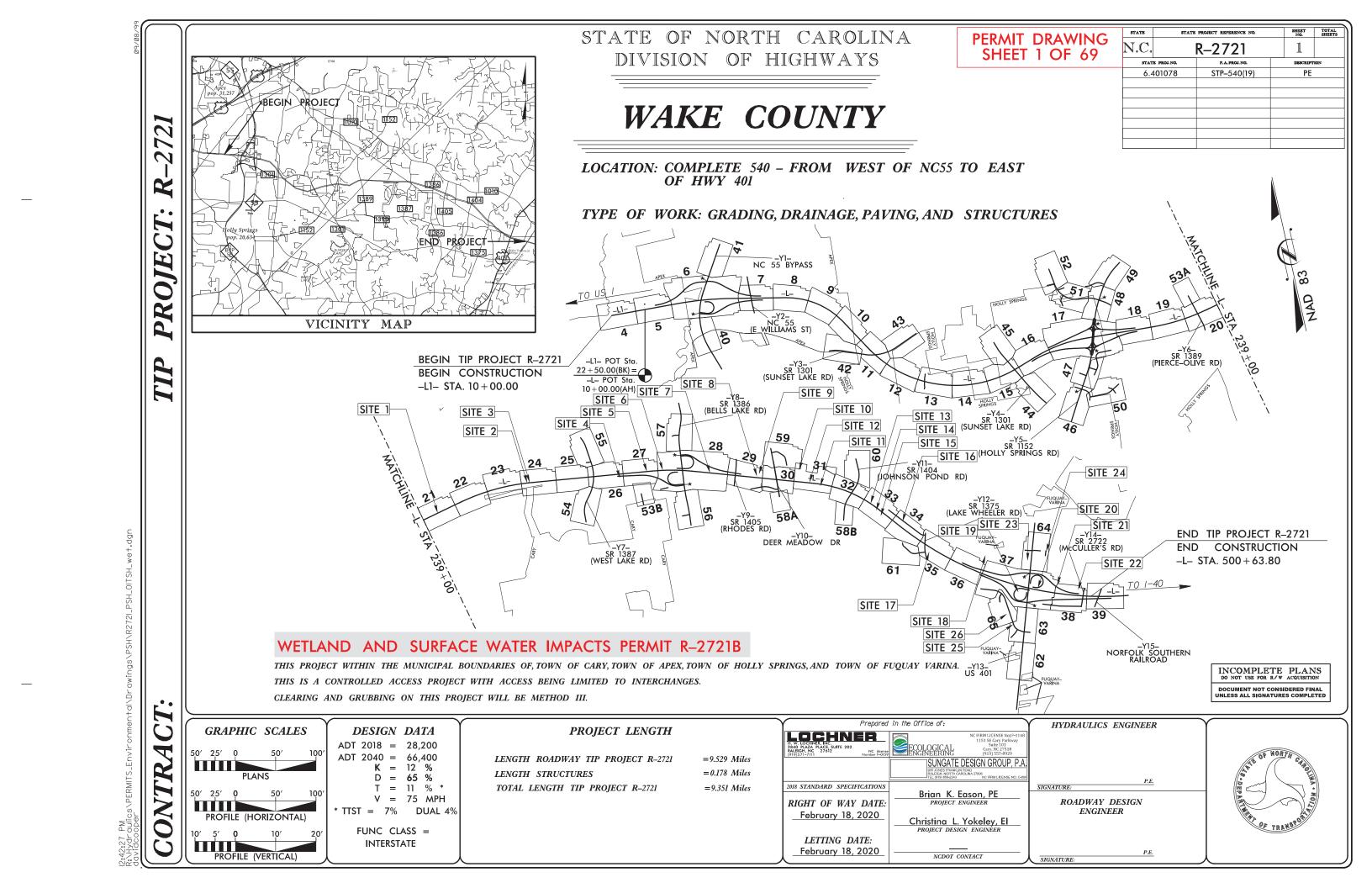
FOR NCDOT PROJECTS

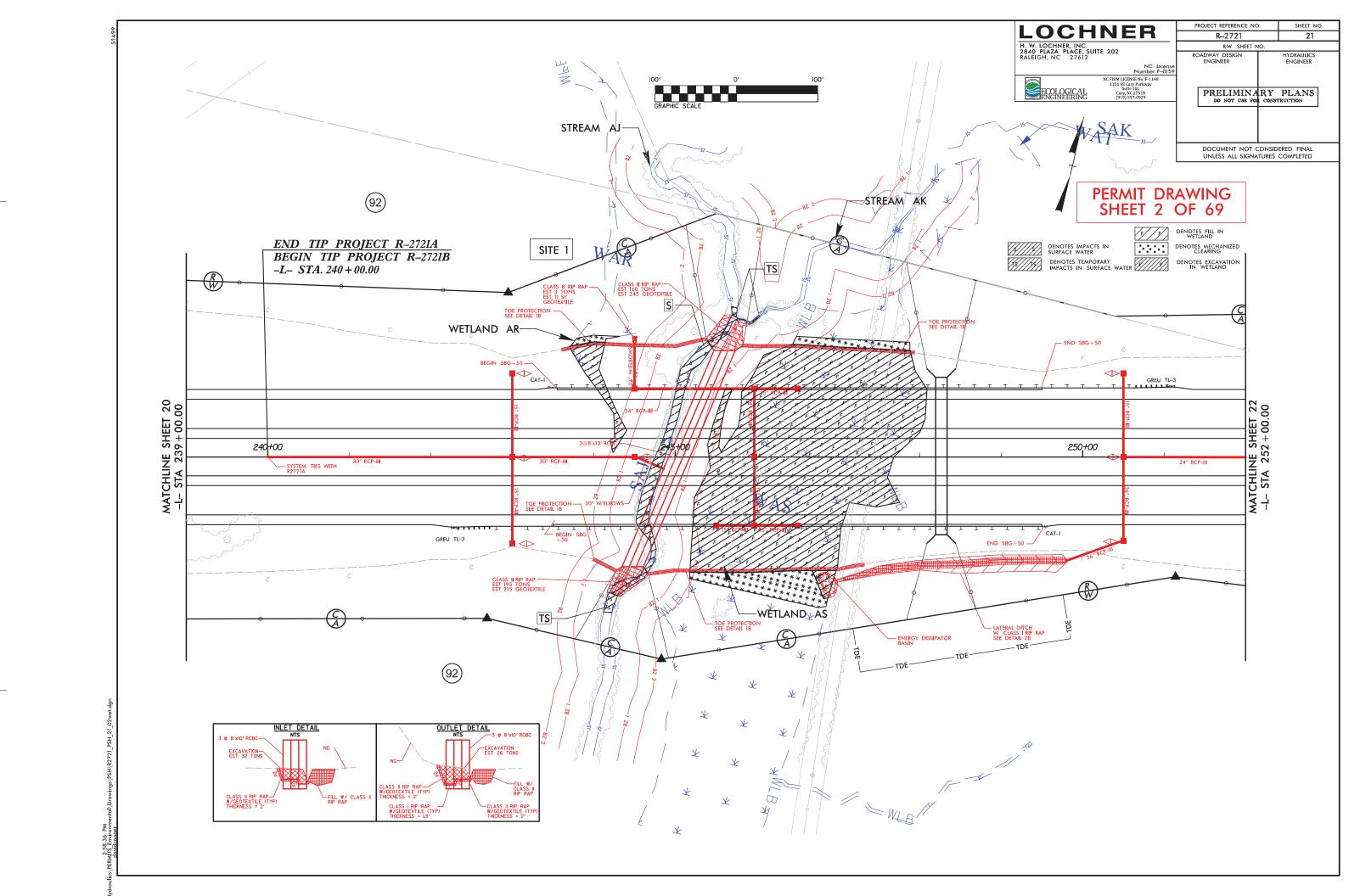
2721B

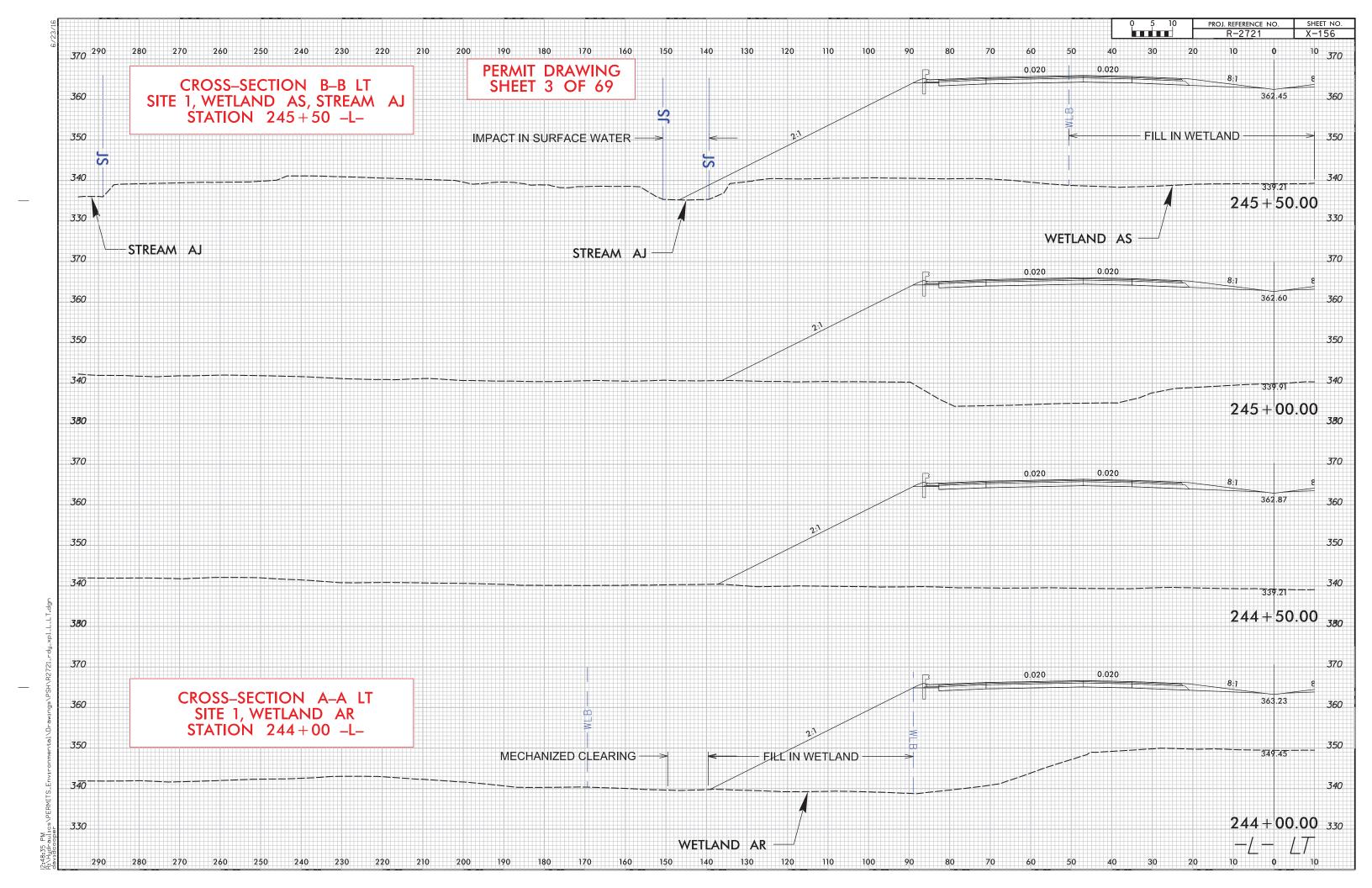
County(ies): Wake

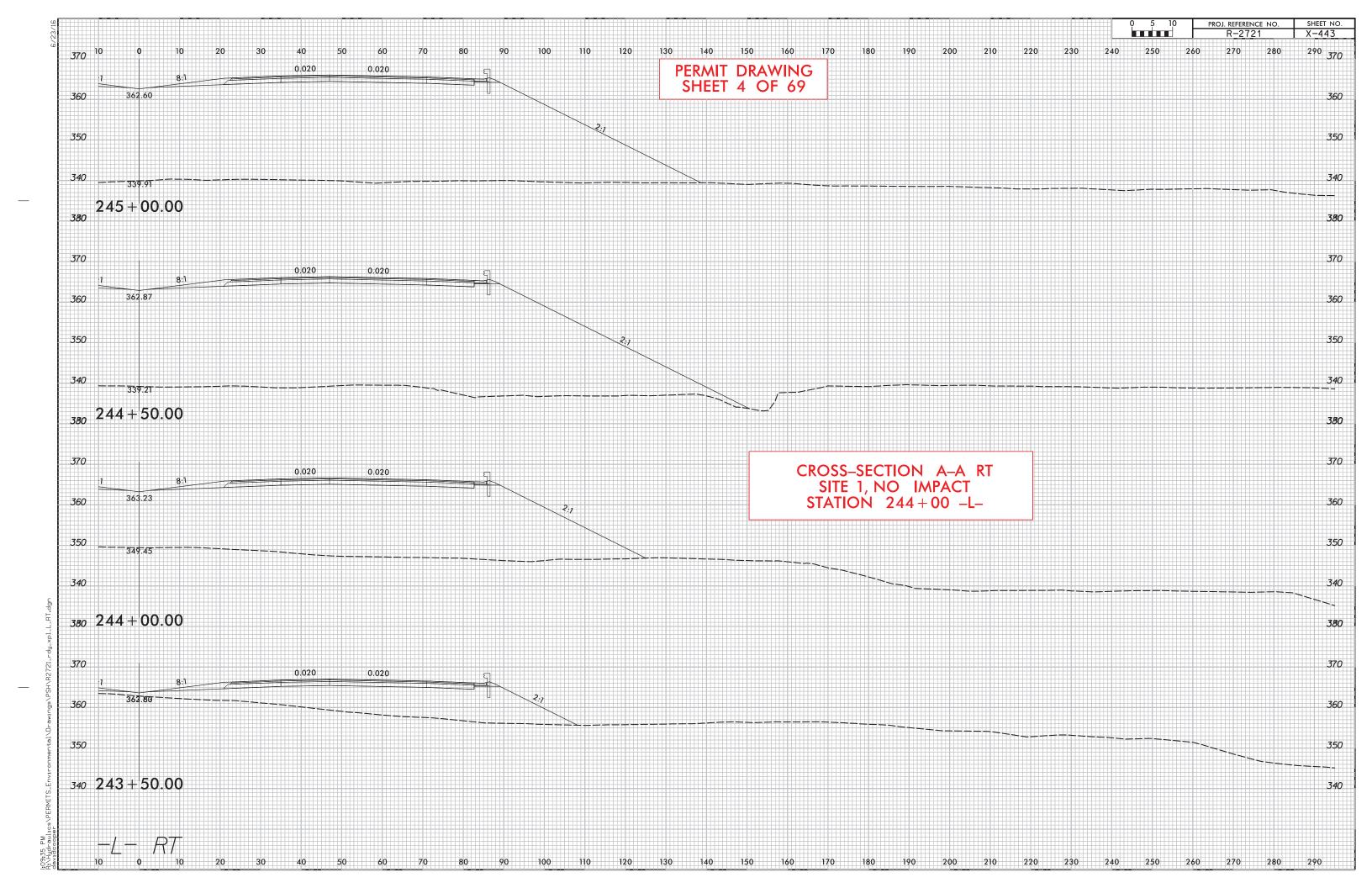
	WBS Element:		TIP No.:	R-2721B	County(ies):	Wake			Page 12	of 12
			Prefori	ned Scour Holes ar	nd Energy Diss	ipators				
Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Energy Dissipator Type	Riprap Type	Drainage Area (ac)	Conveyance Structure	Pipe/Structure Dimensions (in)	Q10 (cfs)	V10 (fps)	BMP Associated w/ Buffer Rules?
21	246+76 -L- RT	(1)Camp Branch	Riprap Energy Dissipator Basin	Class 'B'	14.8	Pipe	36	44.2	1.6	N/A
30	382+24 -L- RT	_	Riprap Energy Dissipator Basin	Class I	29.1	Pipe	42	55.0	1.3	N/A
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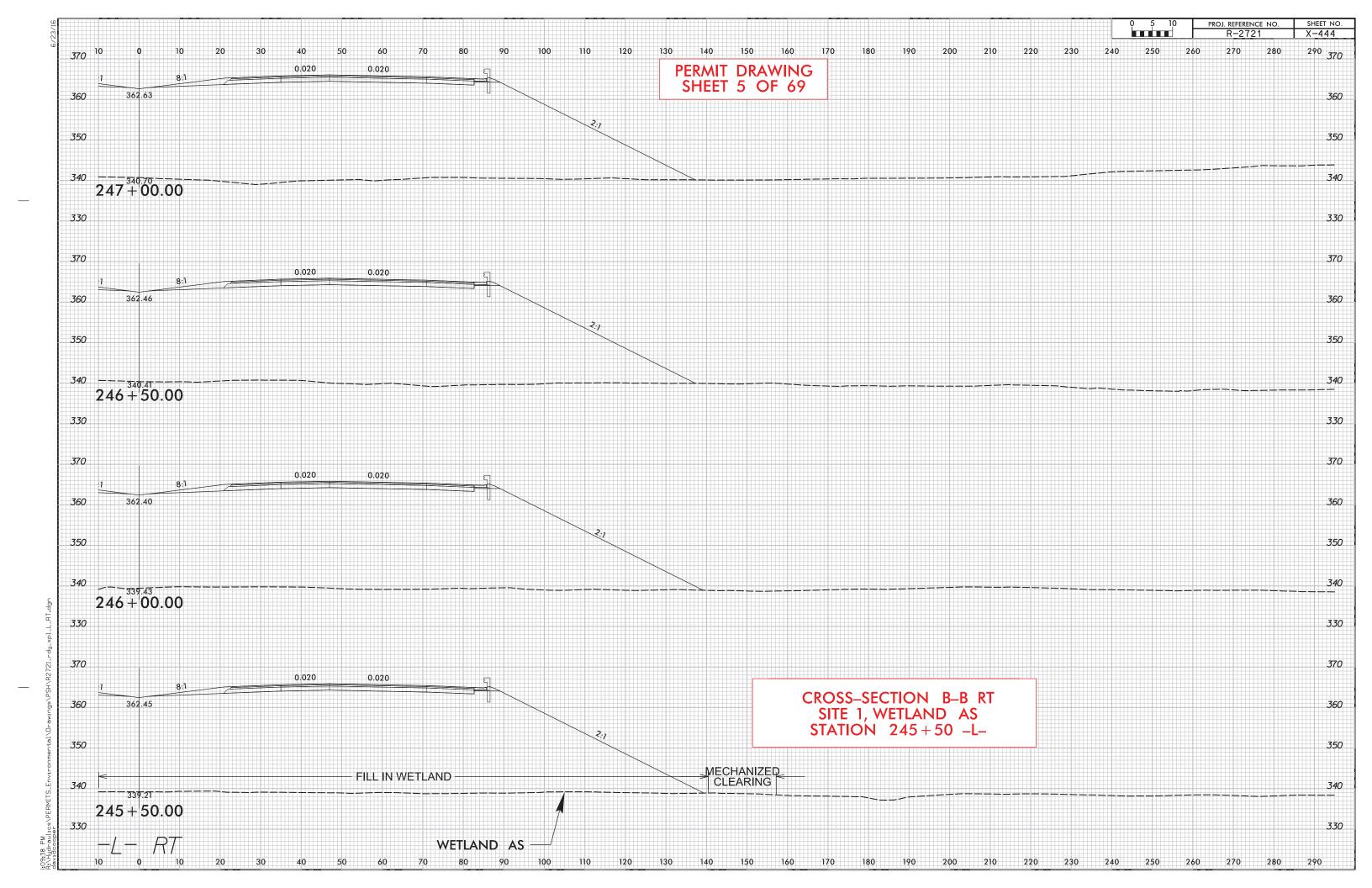
* Refer to the NCDOT Best Management Practices Toolbox (2014), NCDOT Standards, the Federal Highway Administration (FHWA) Hydraulic Engineering Circular No. 14 (HEC-14), Third Edition, Hydraulic Design of Energy Dissipators for Culverts and Channels (July 2006), as applicable, for design guidance and criteria.

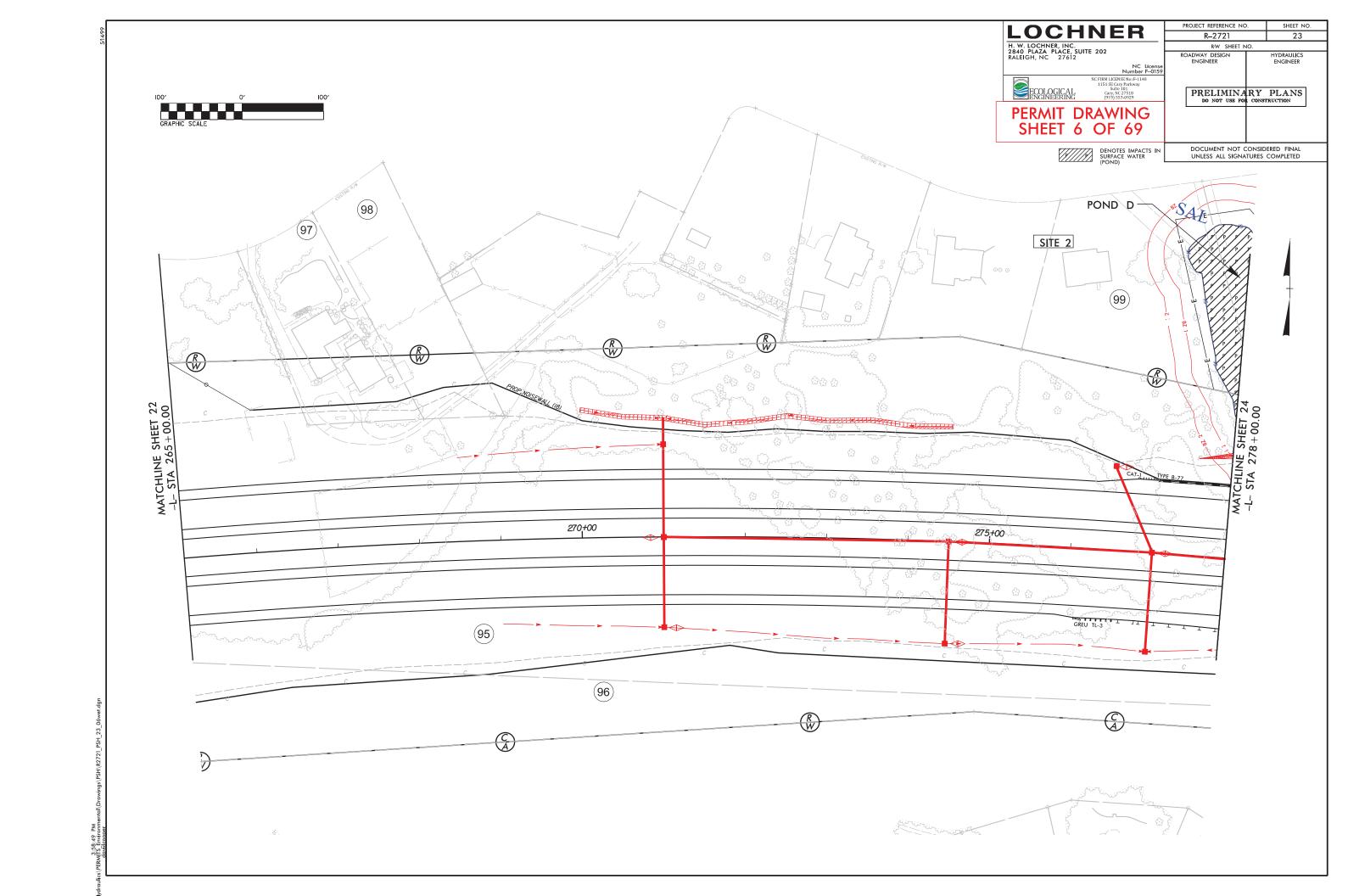


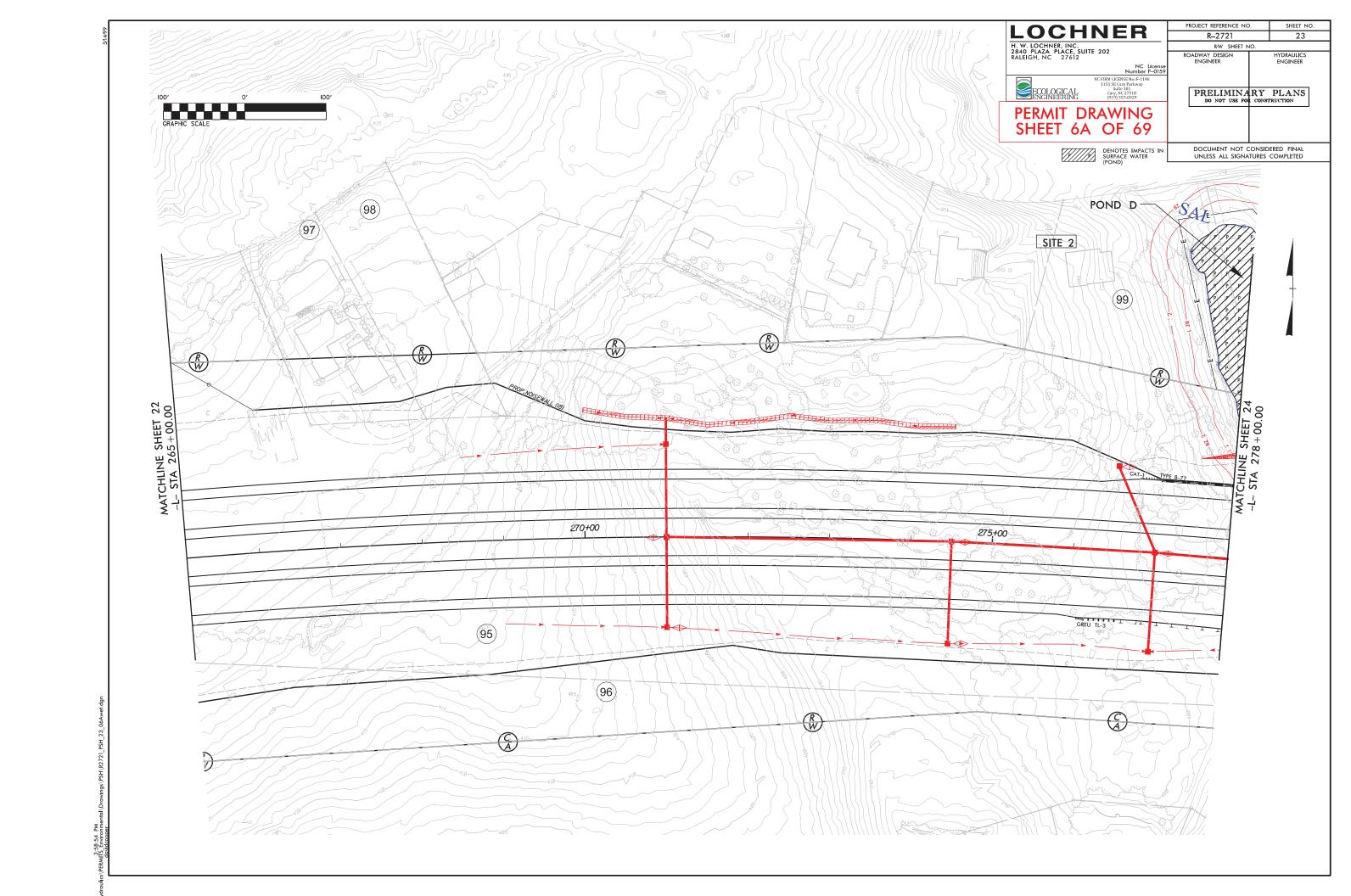


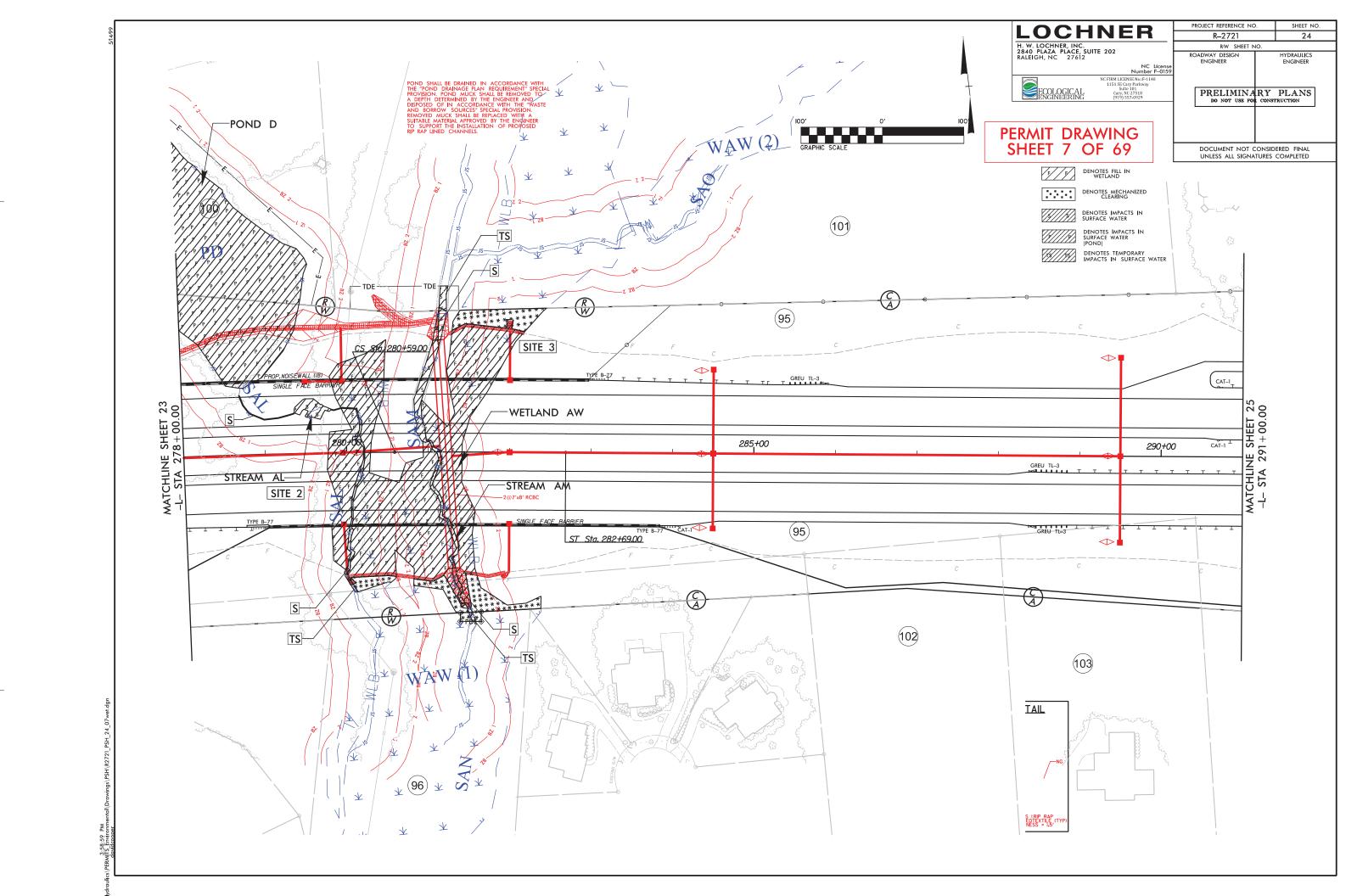


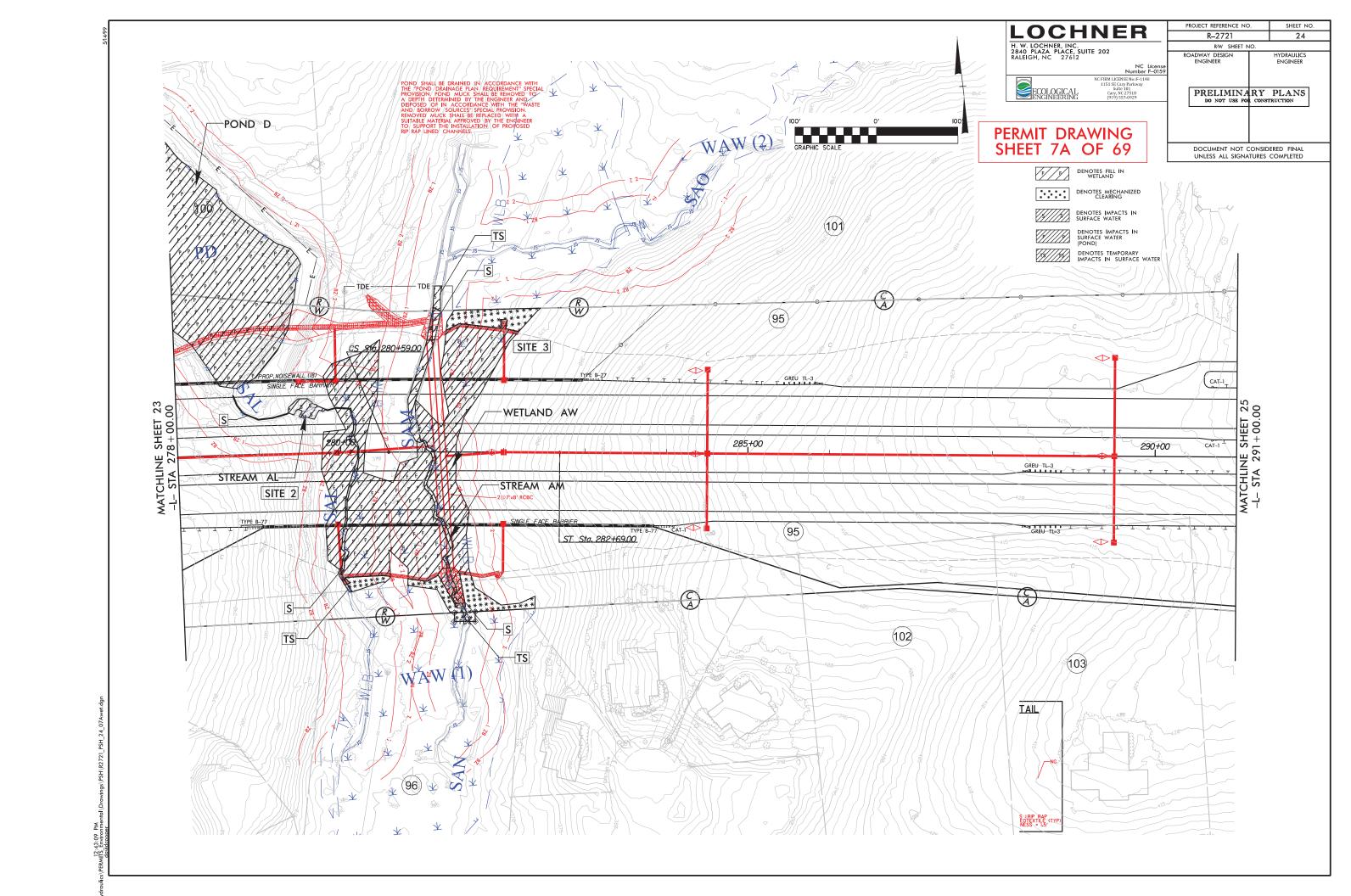


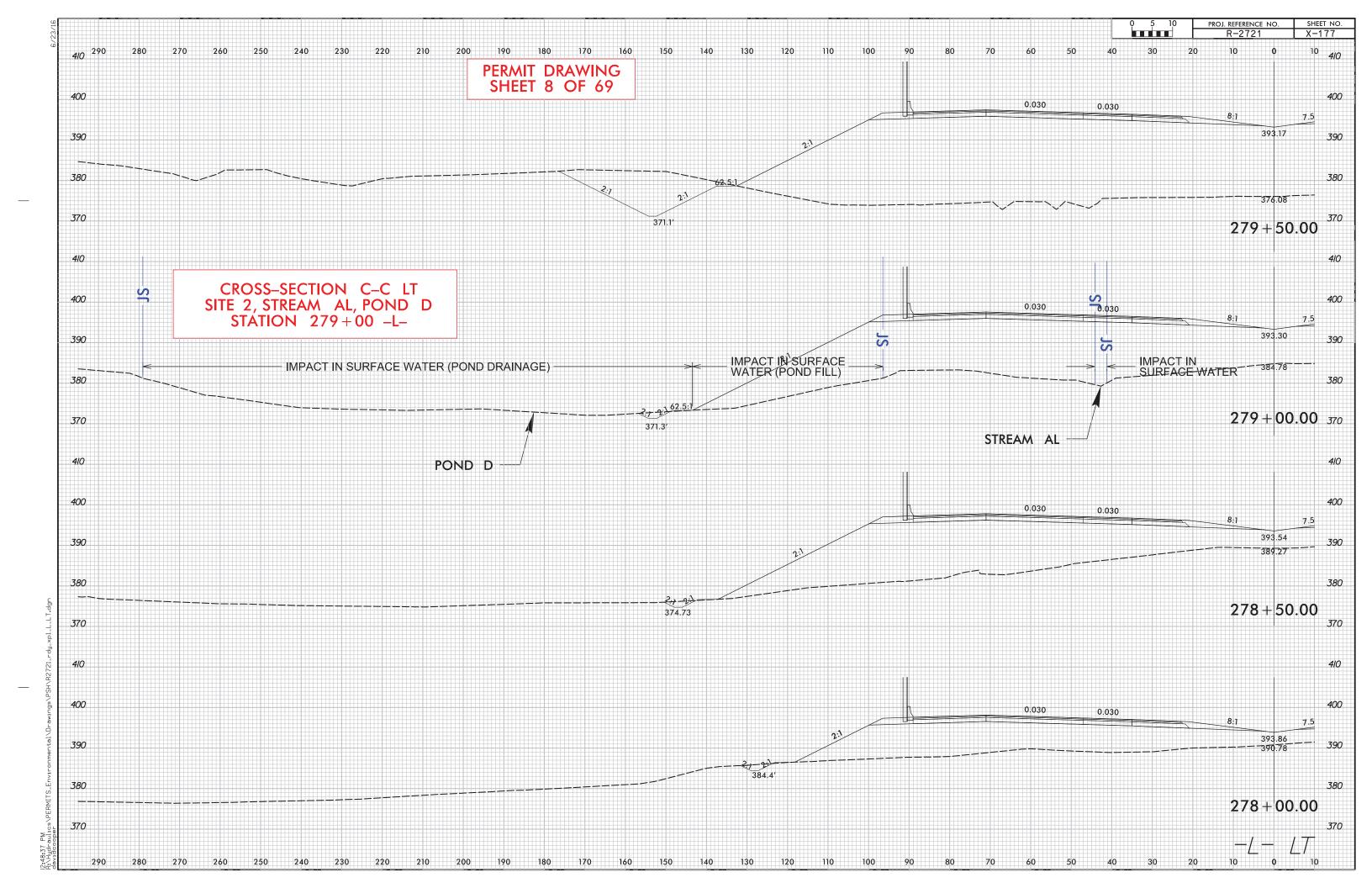


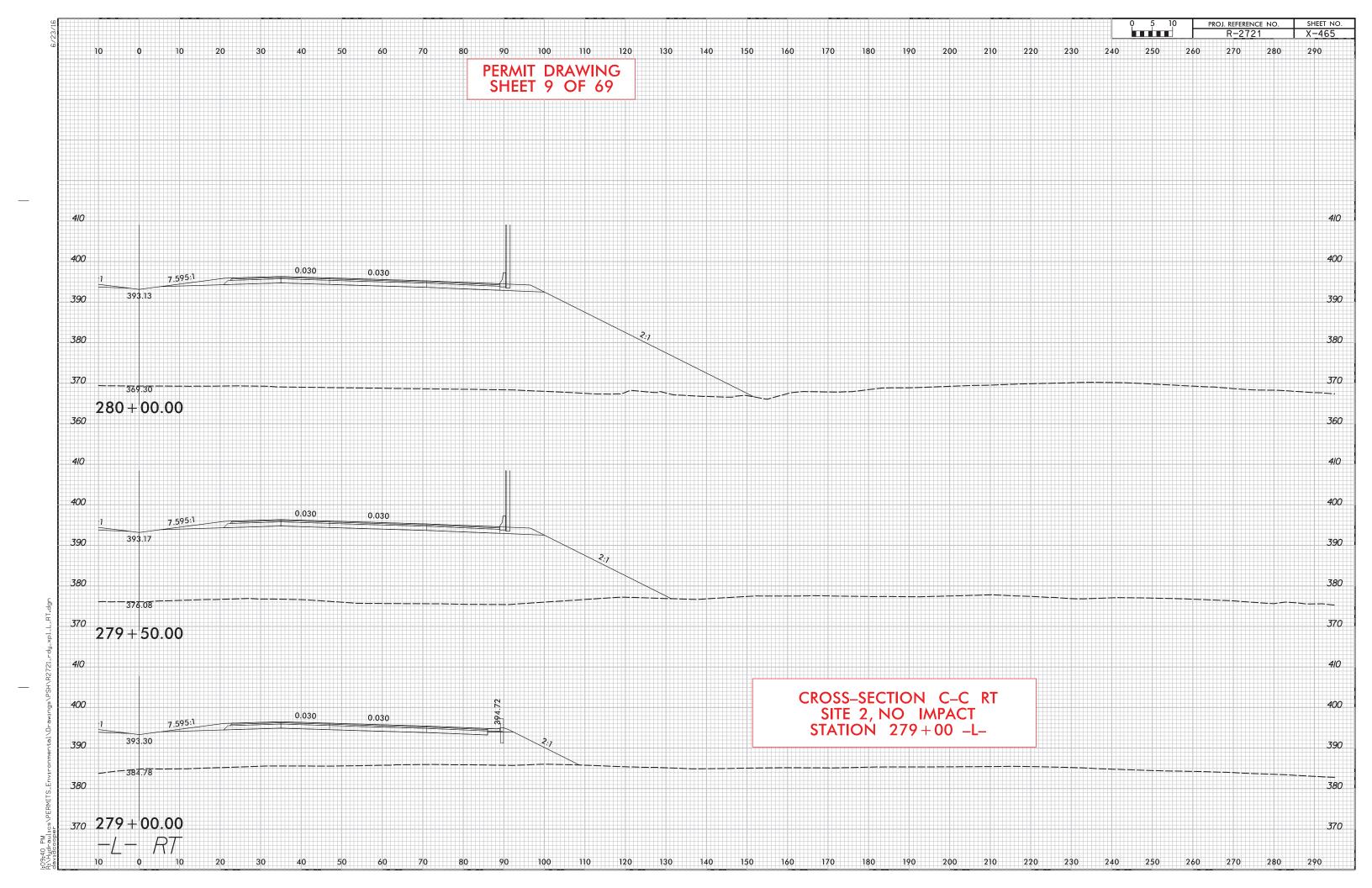


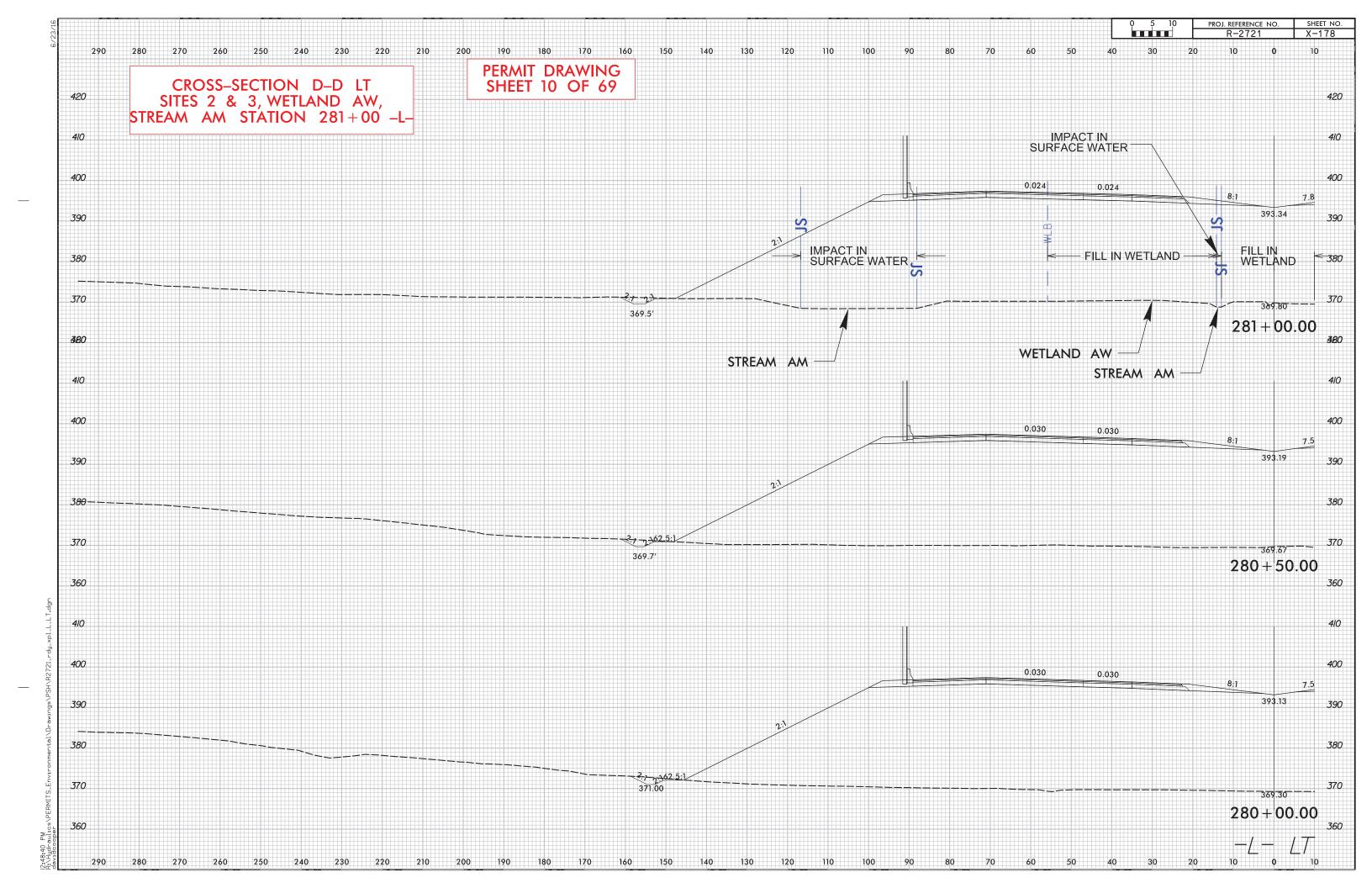


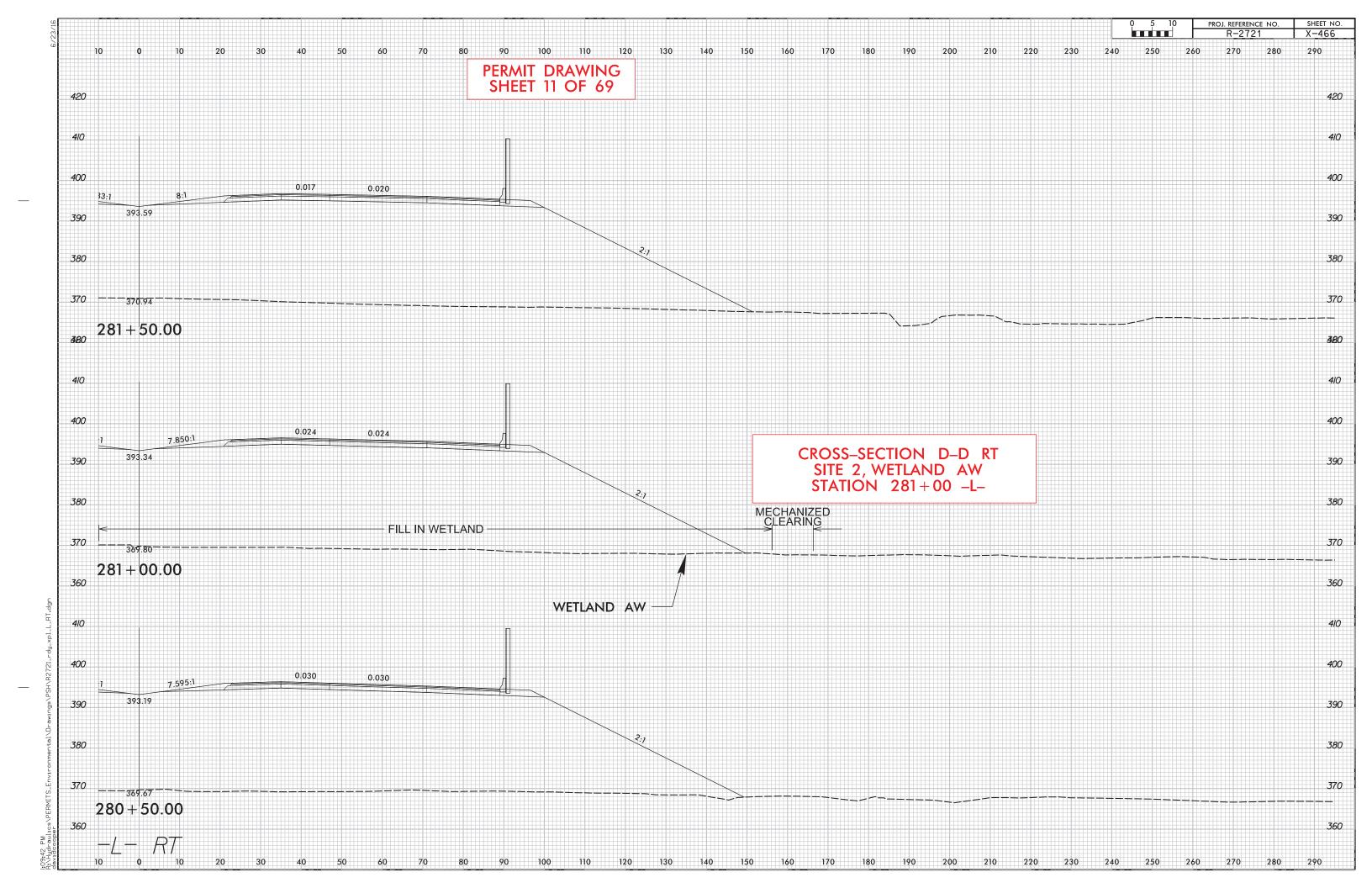


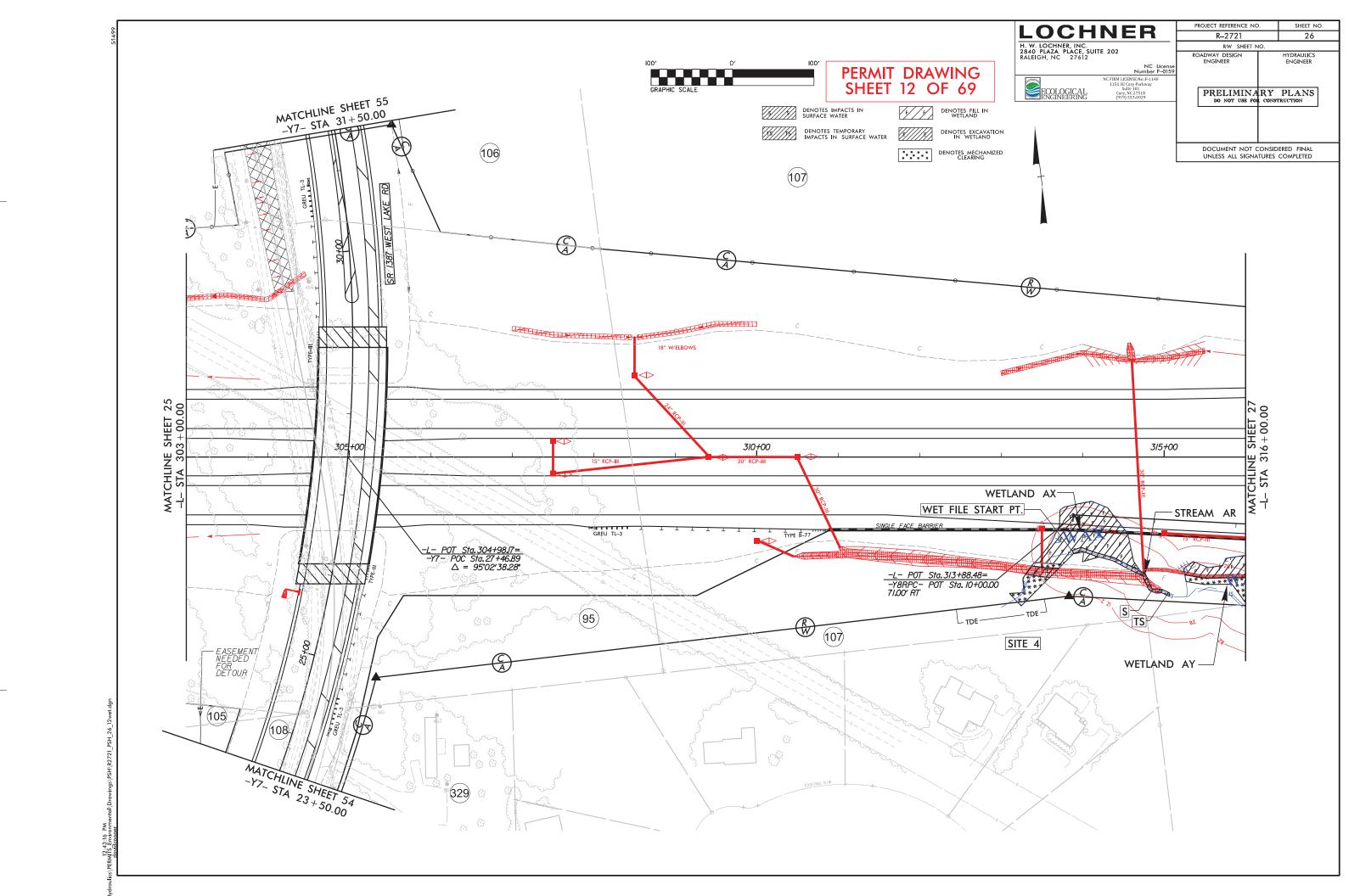


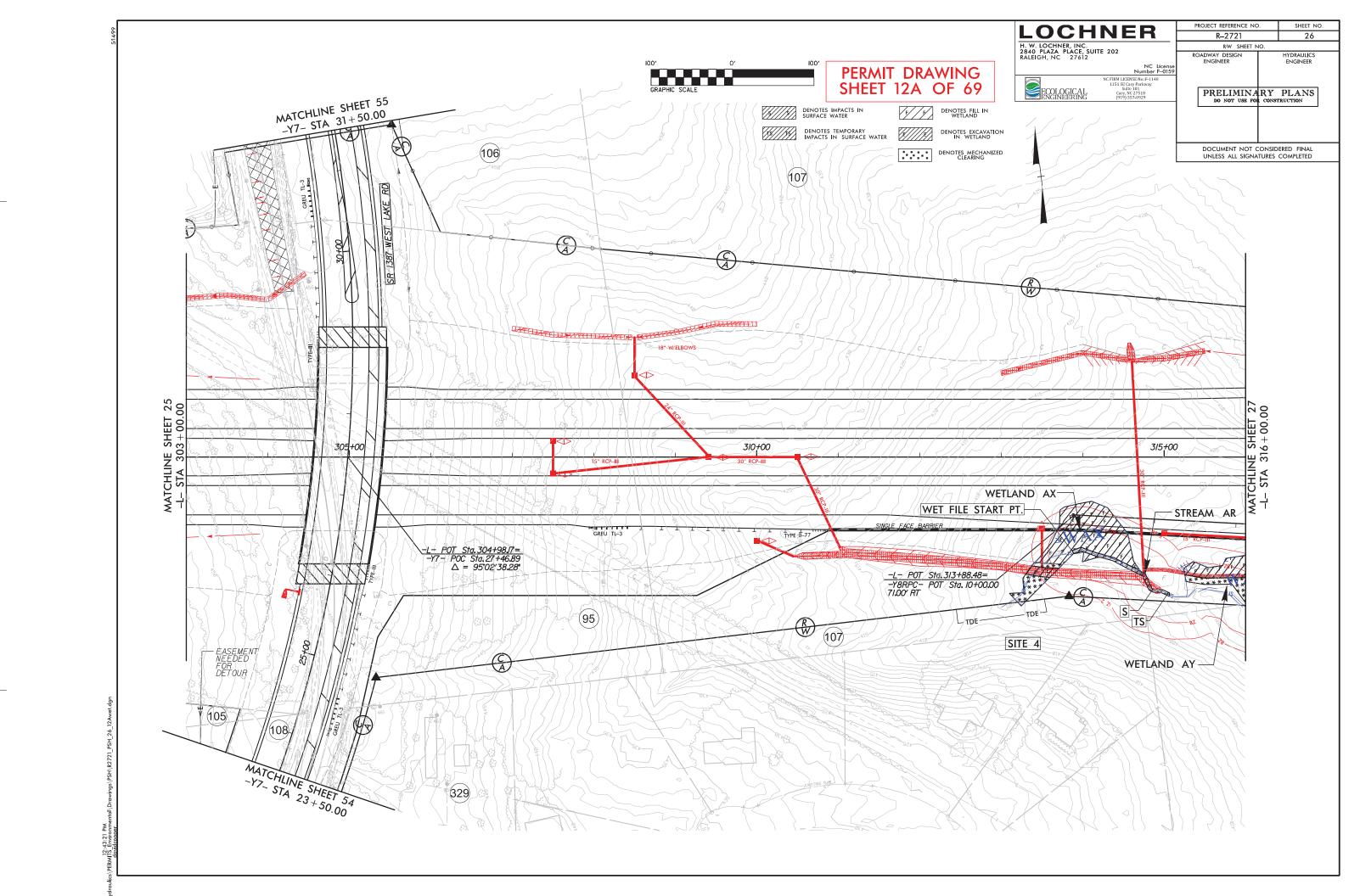


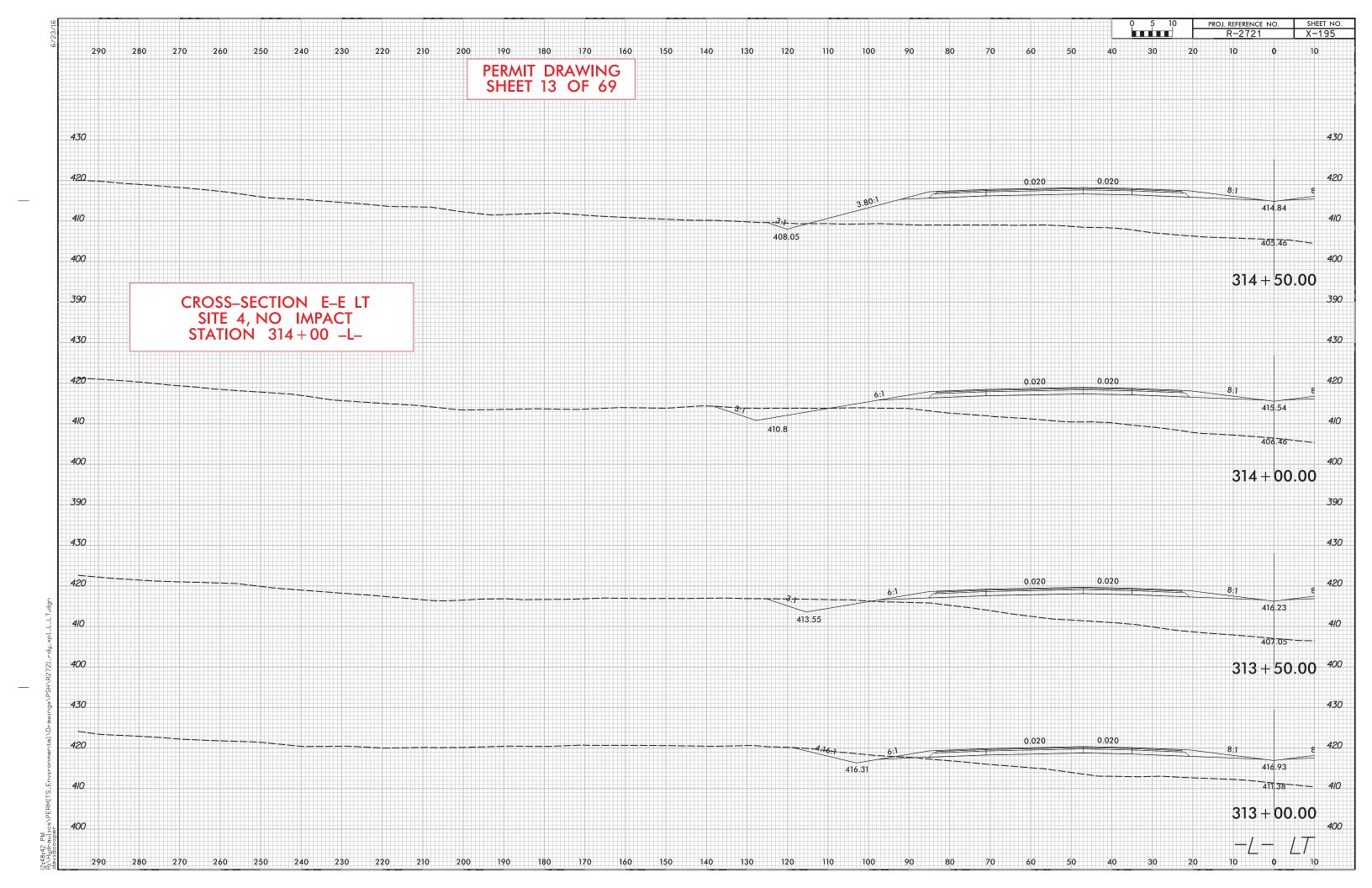


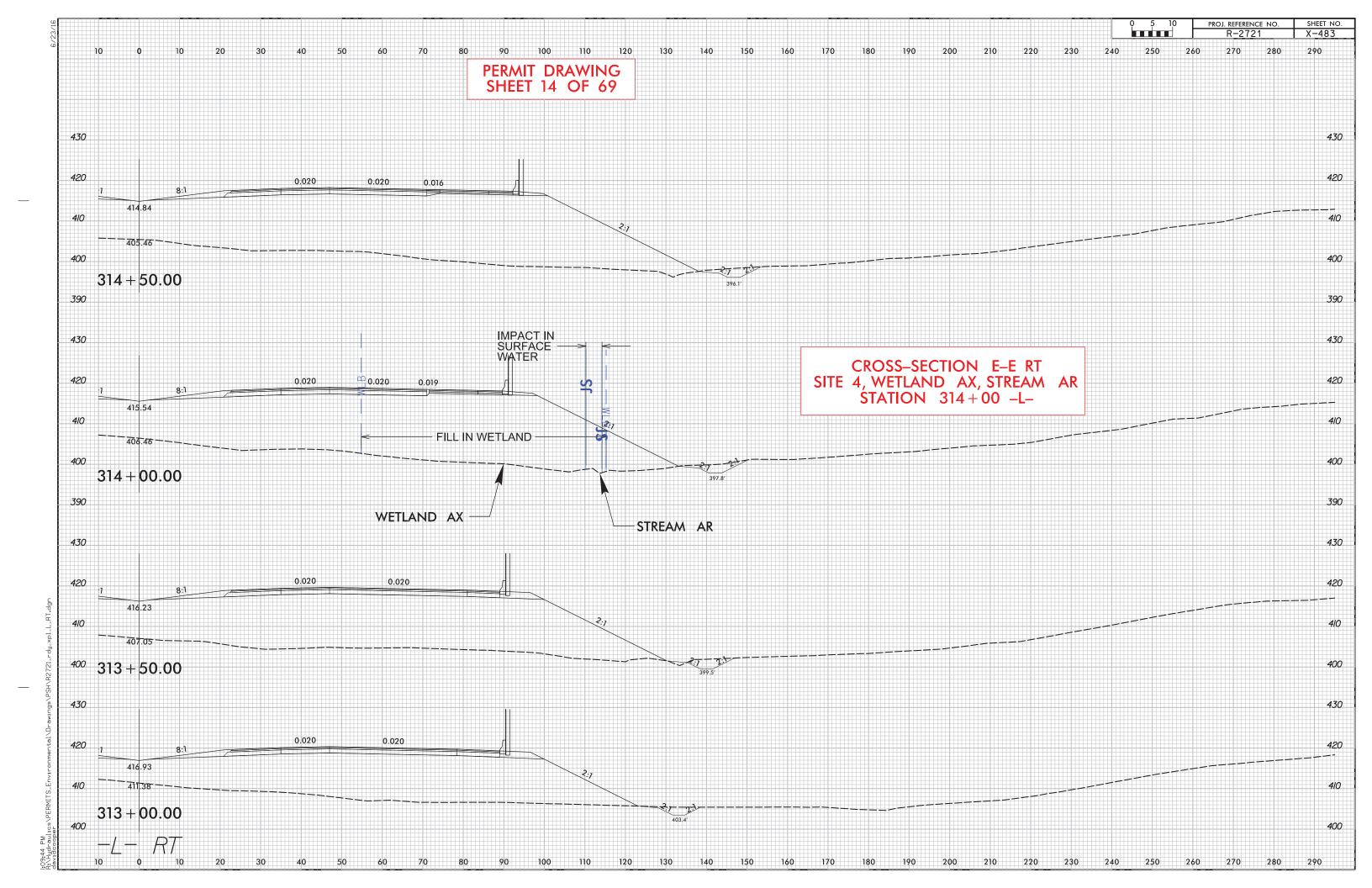


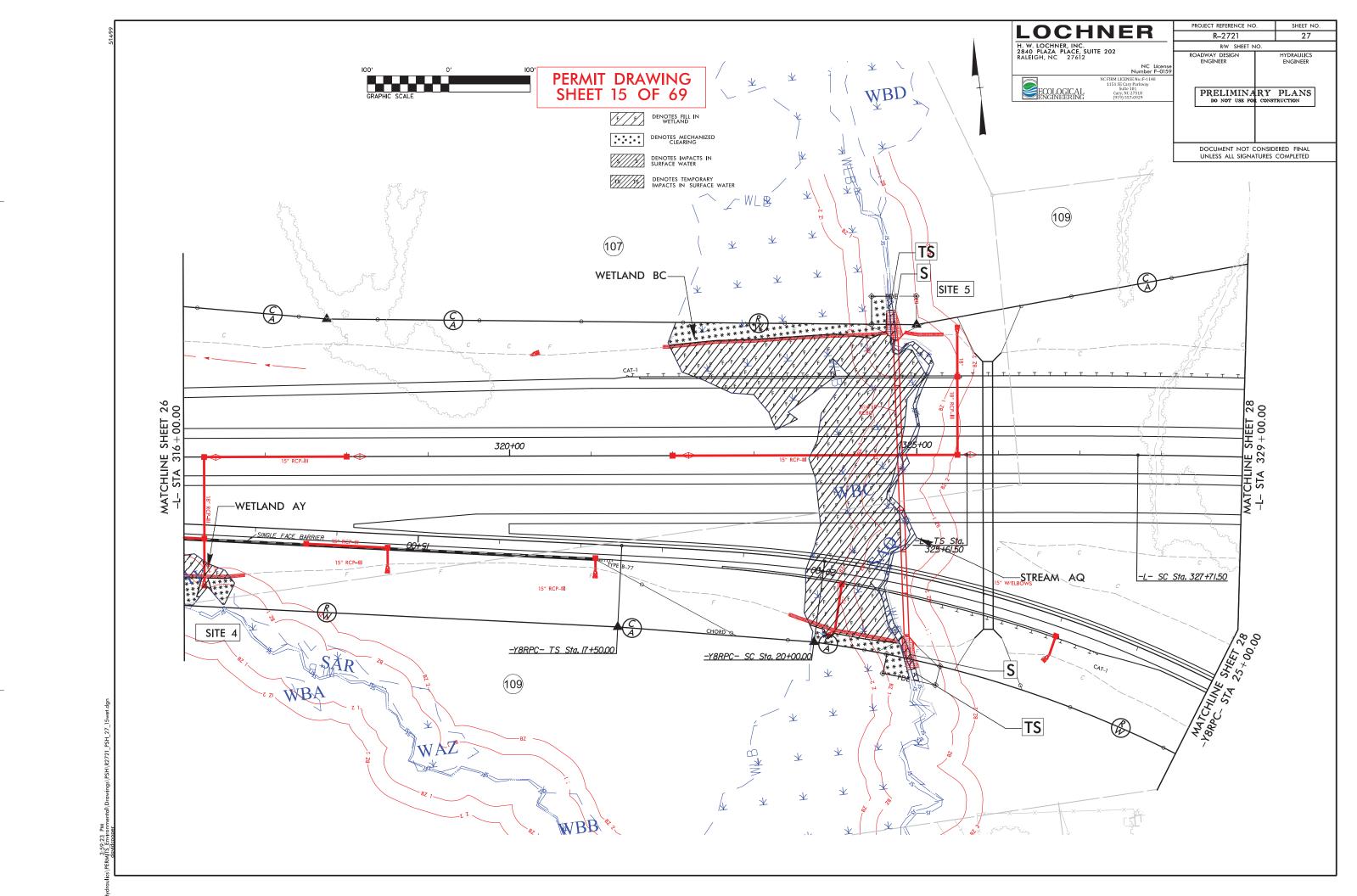


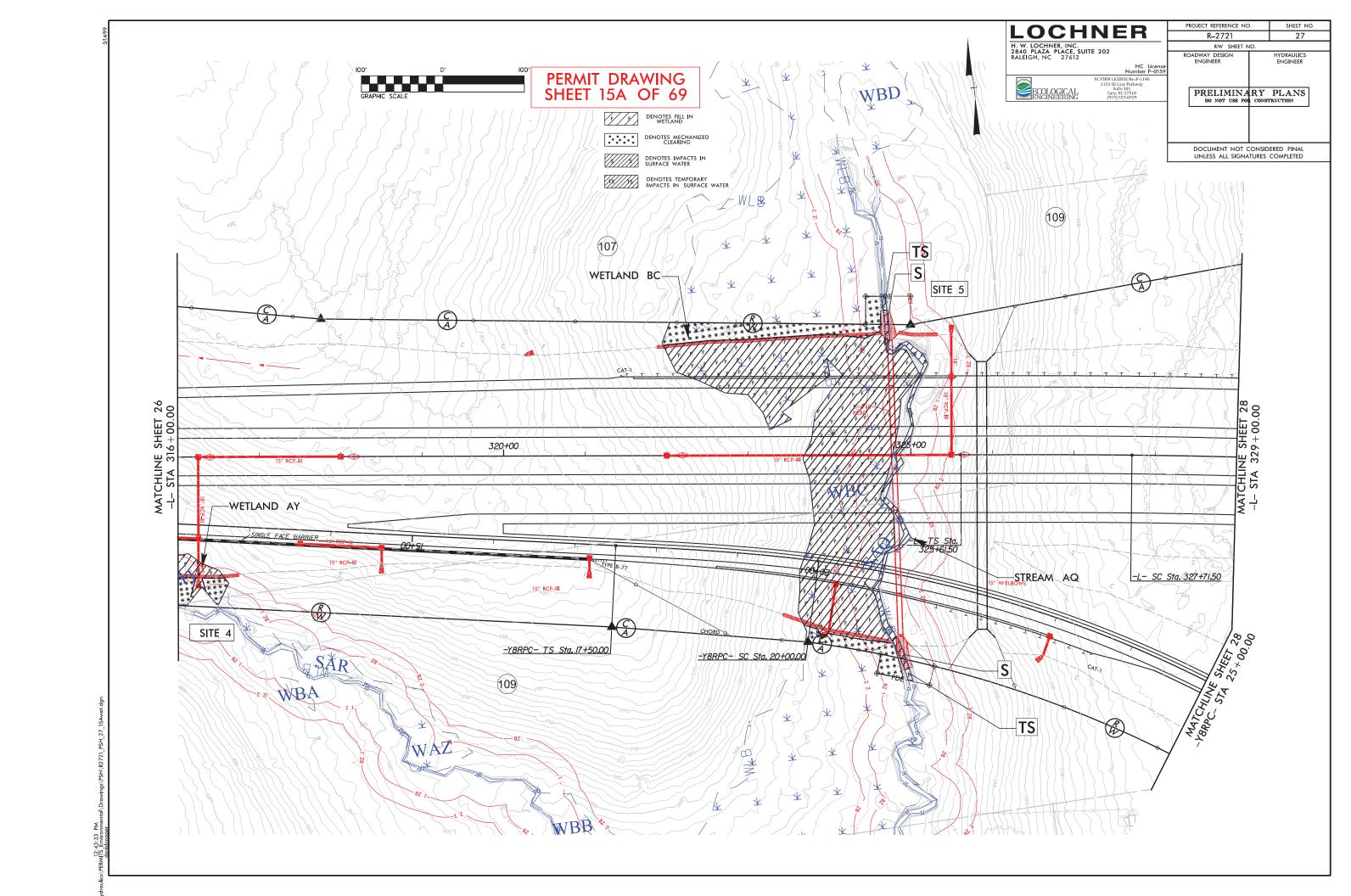


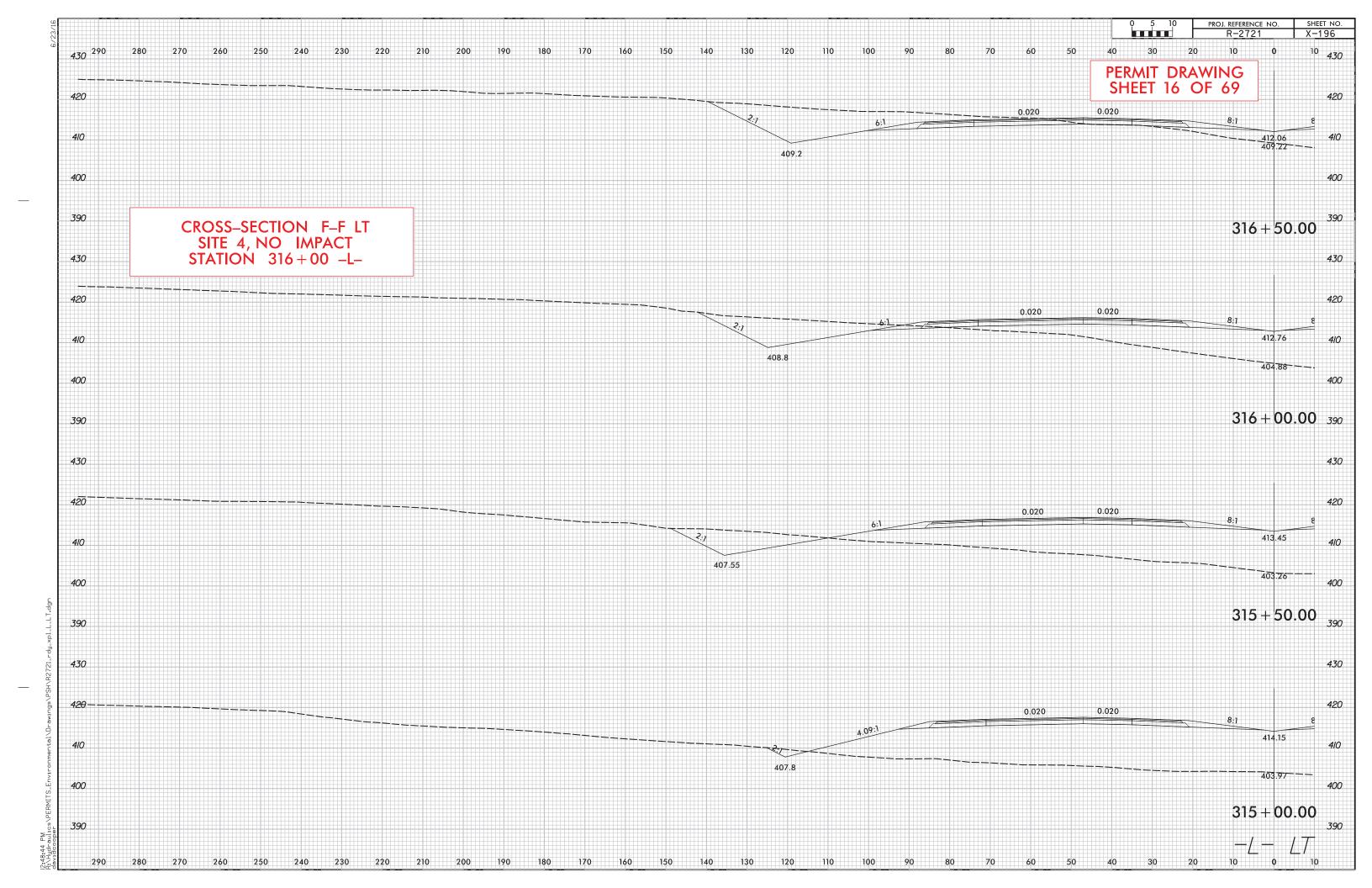


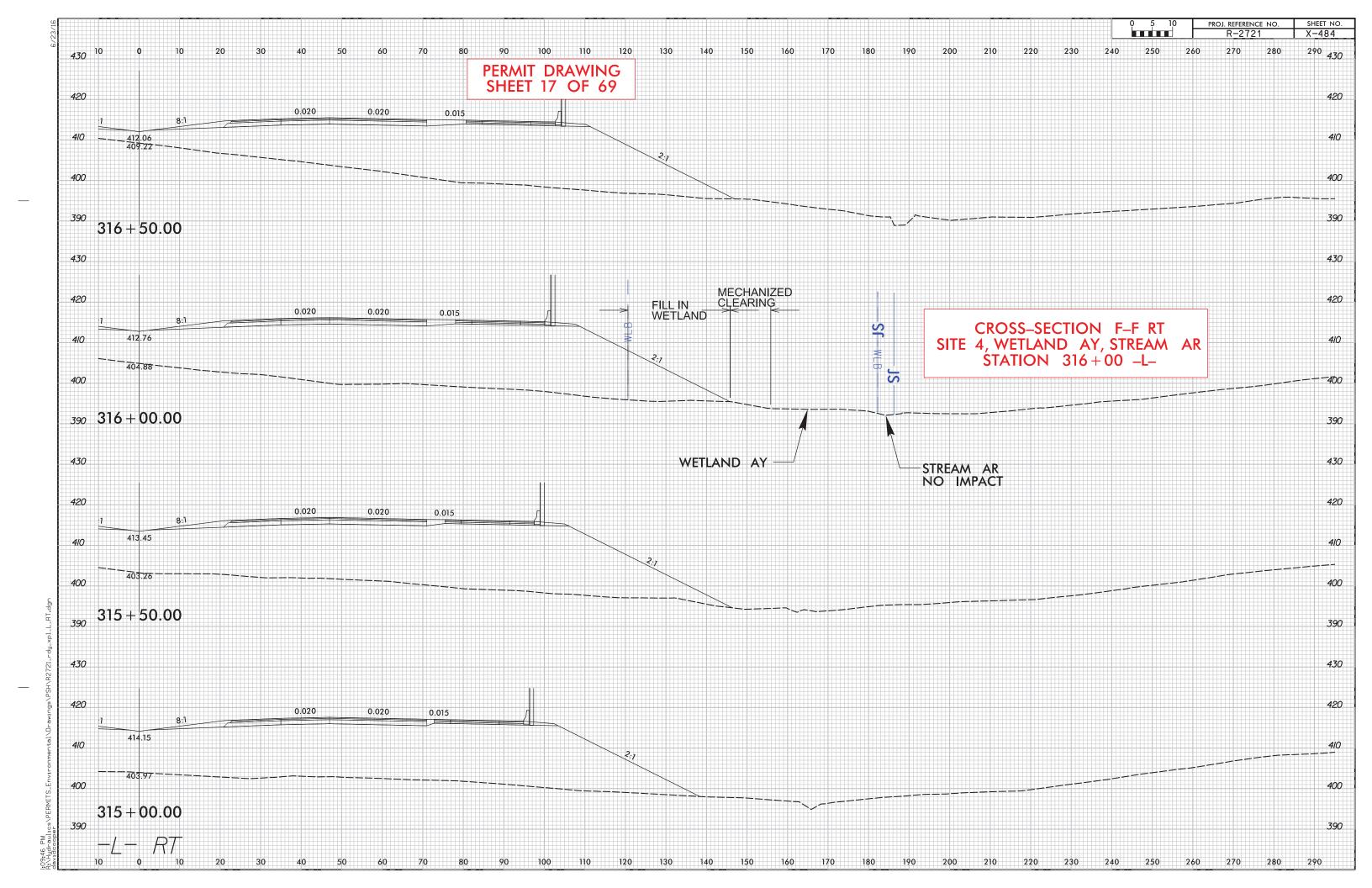


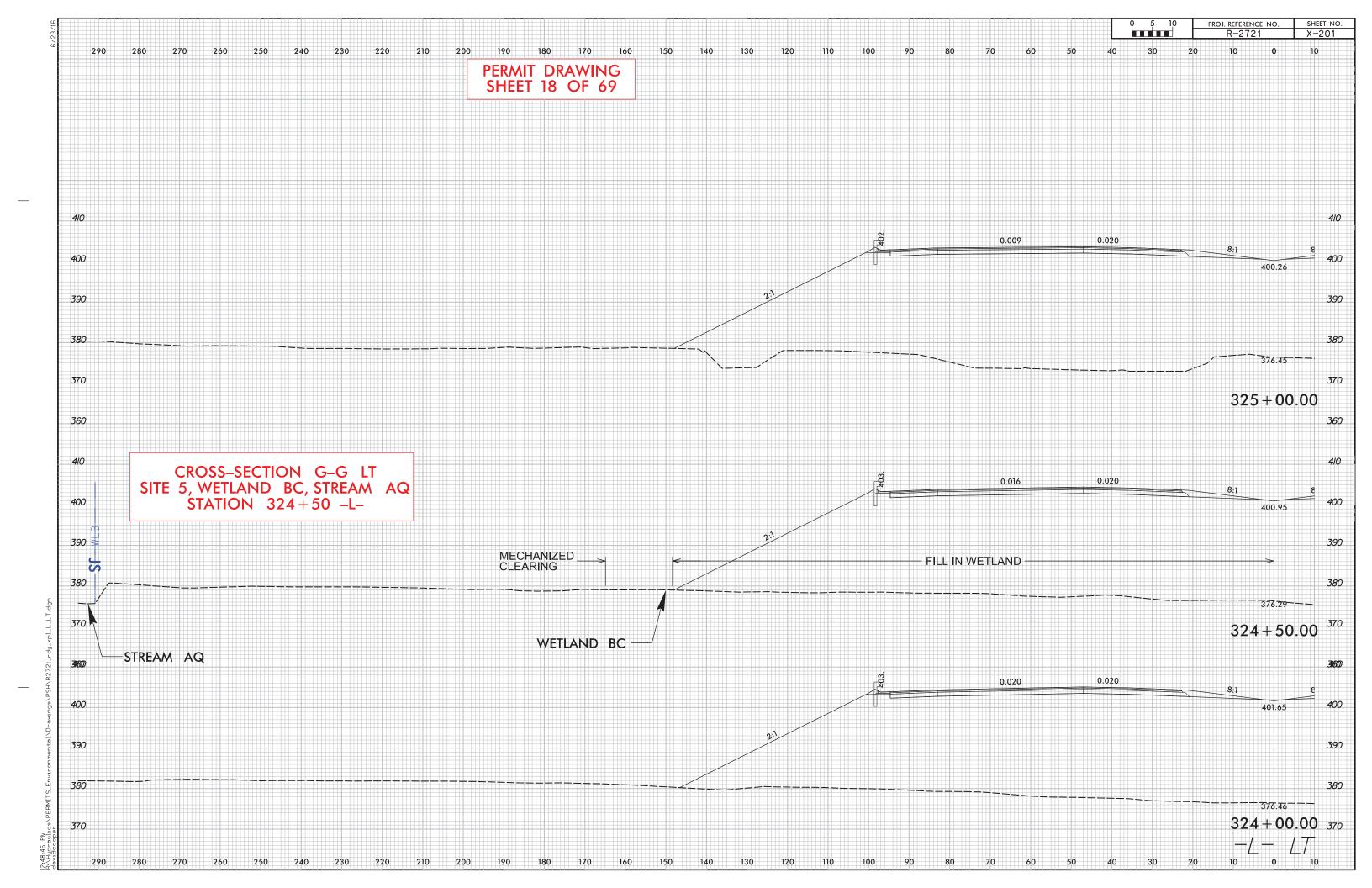


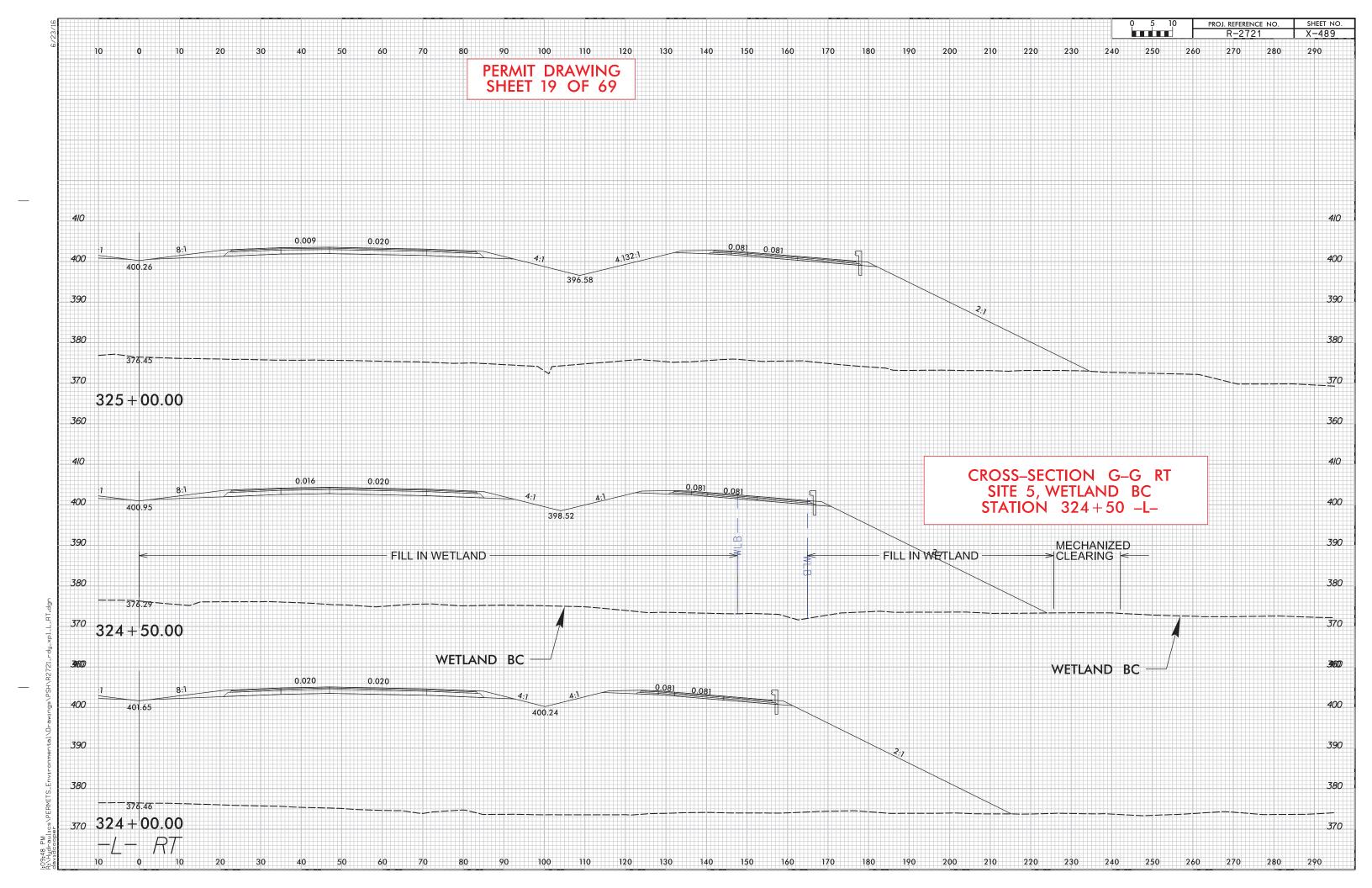


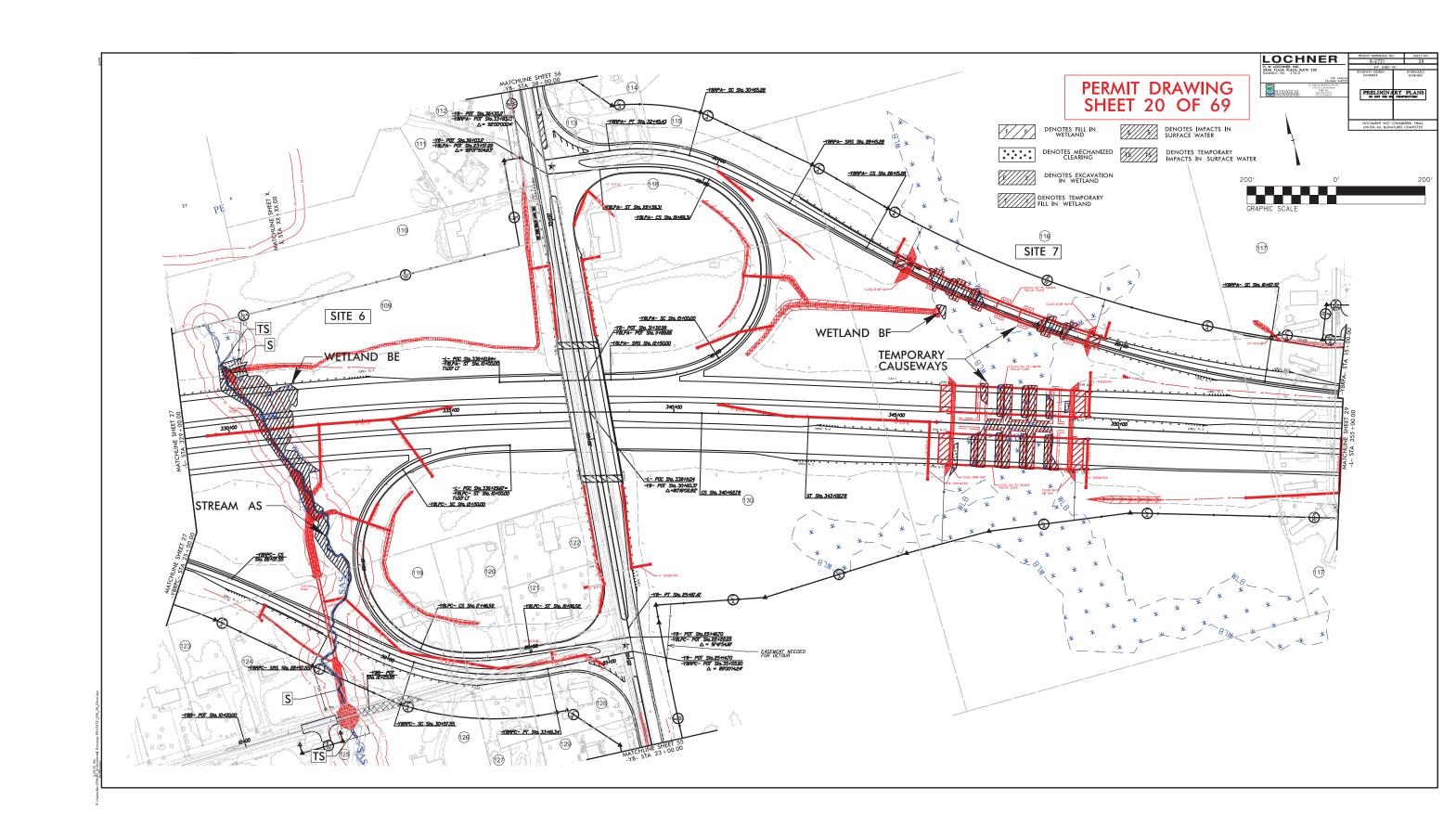


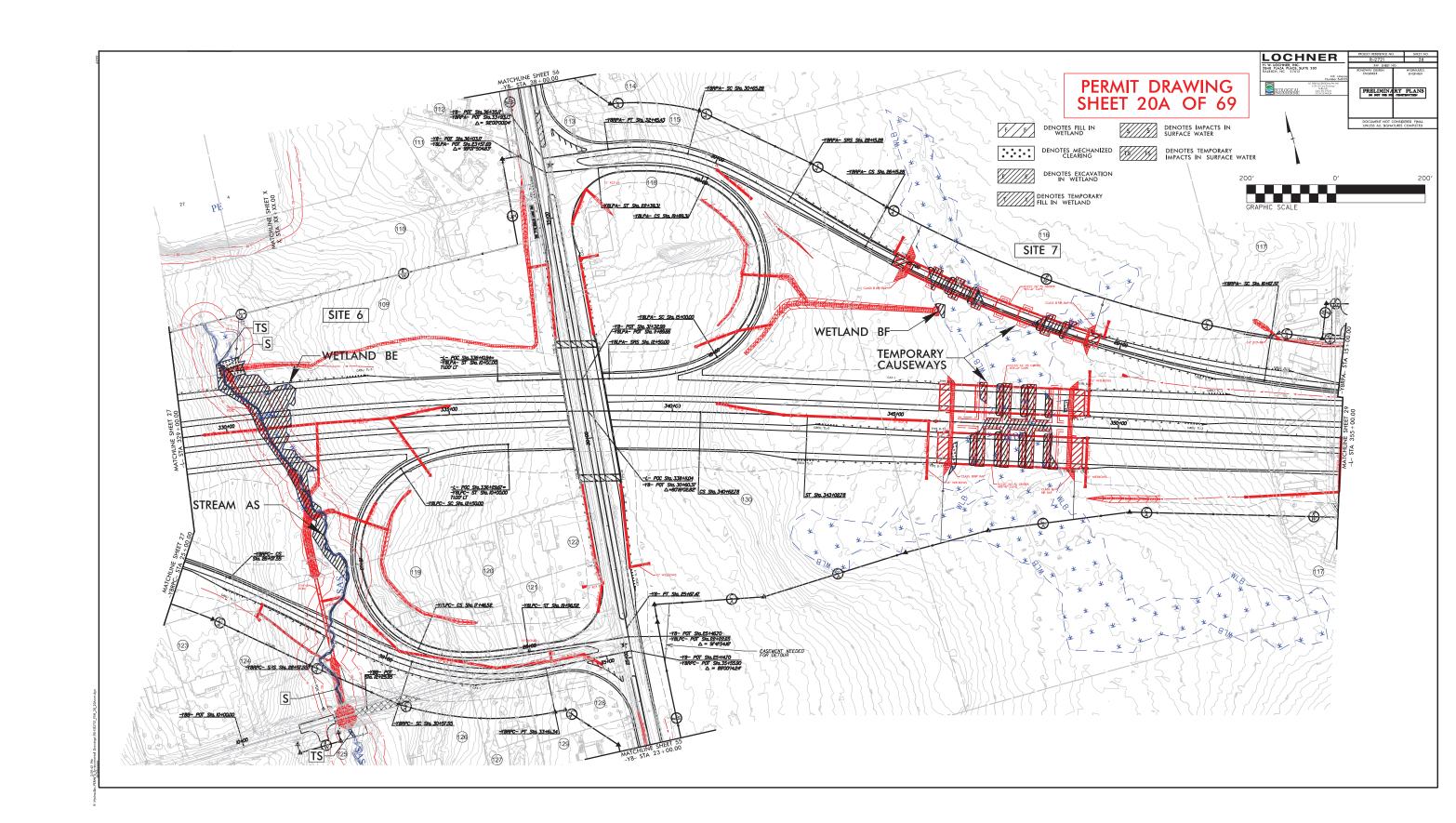


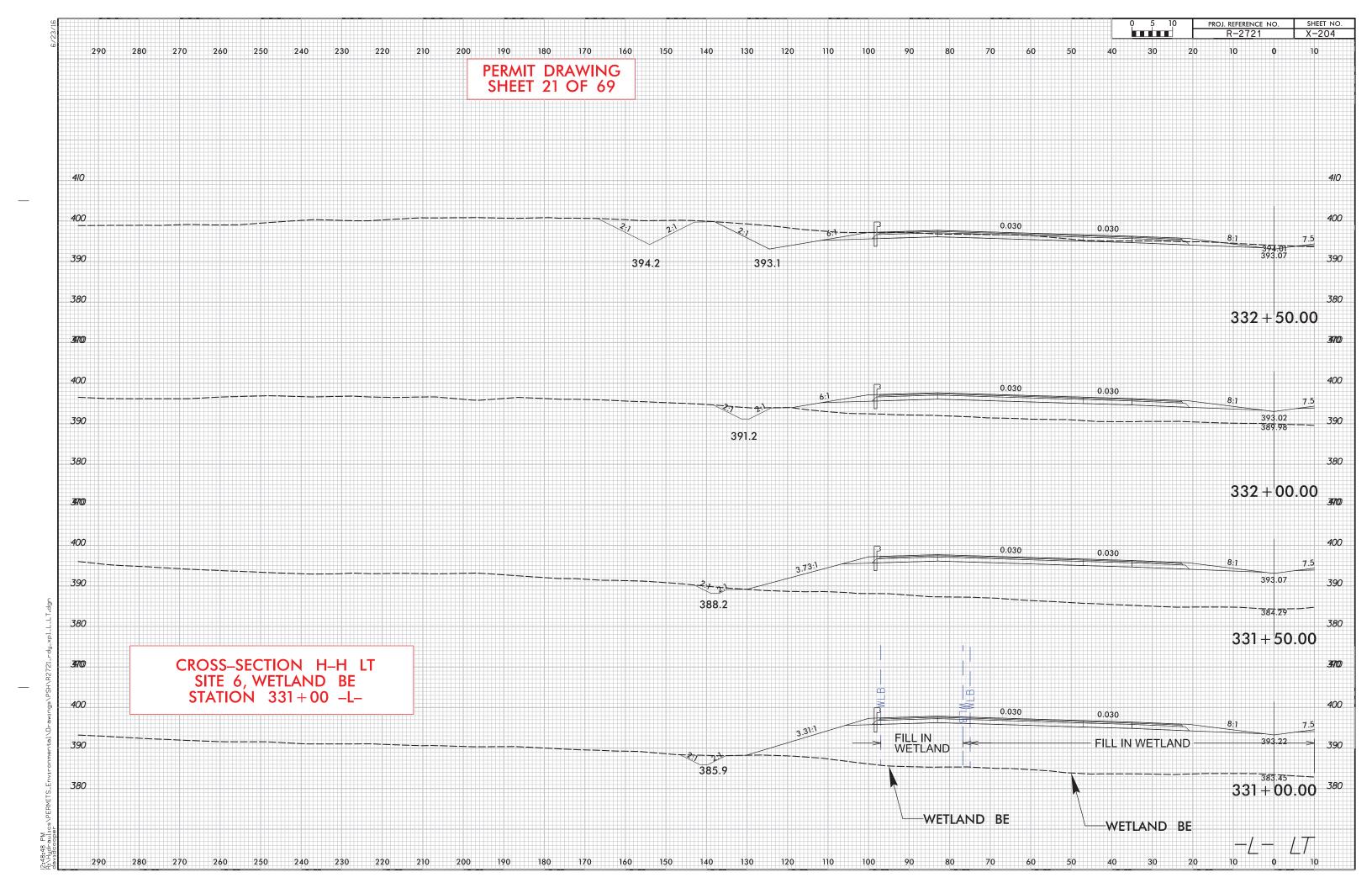


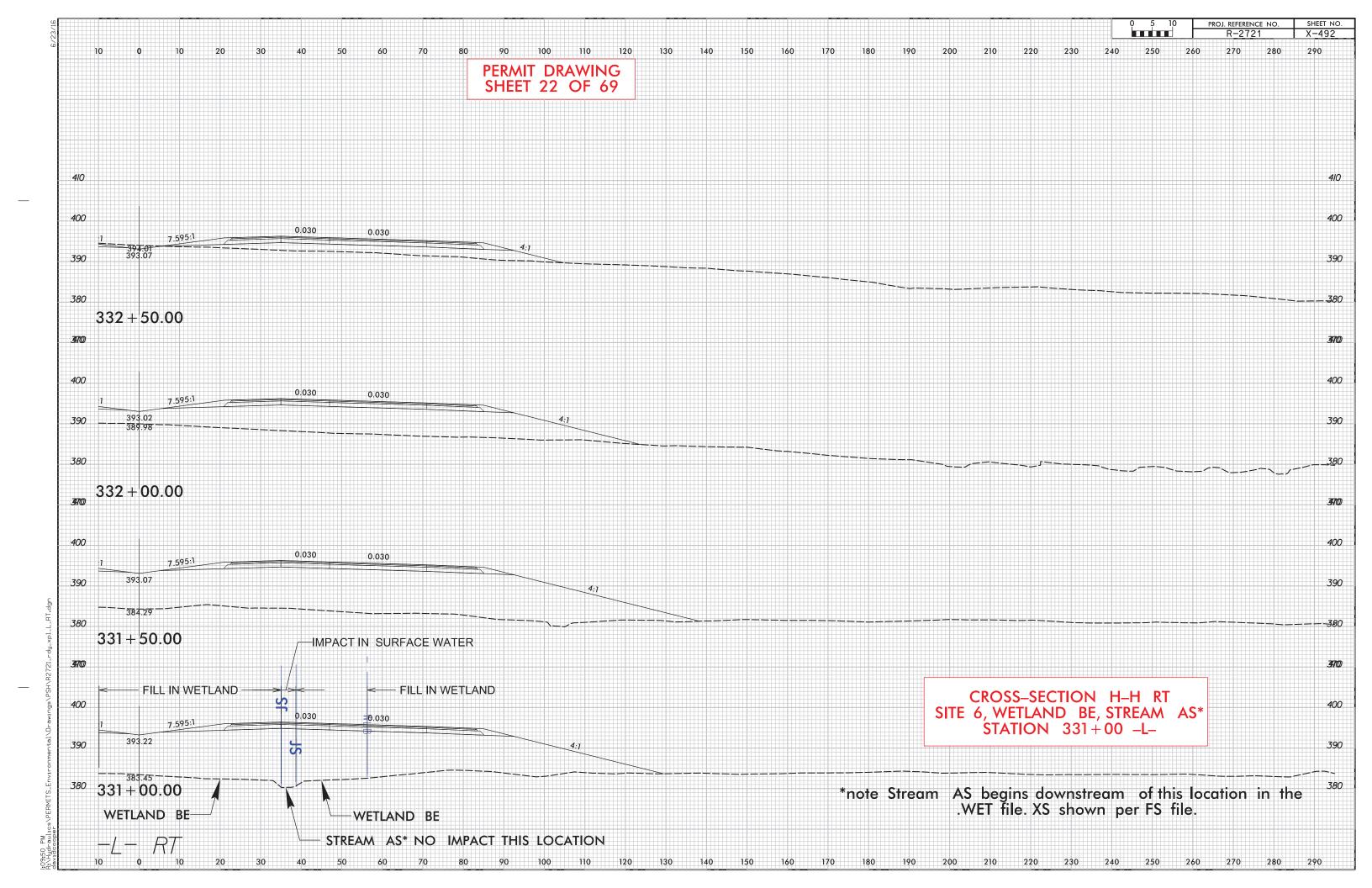


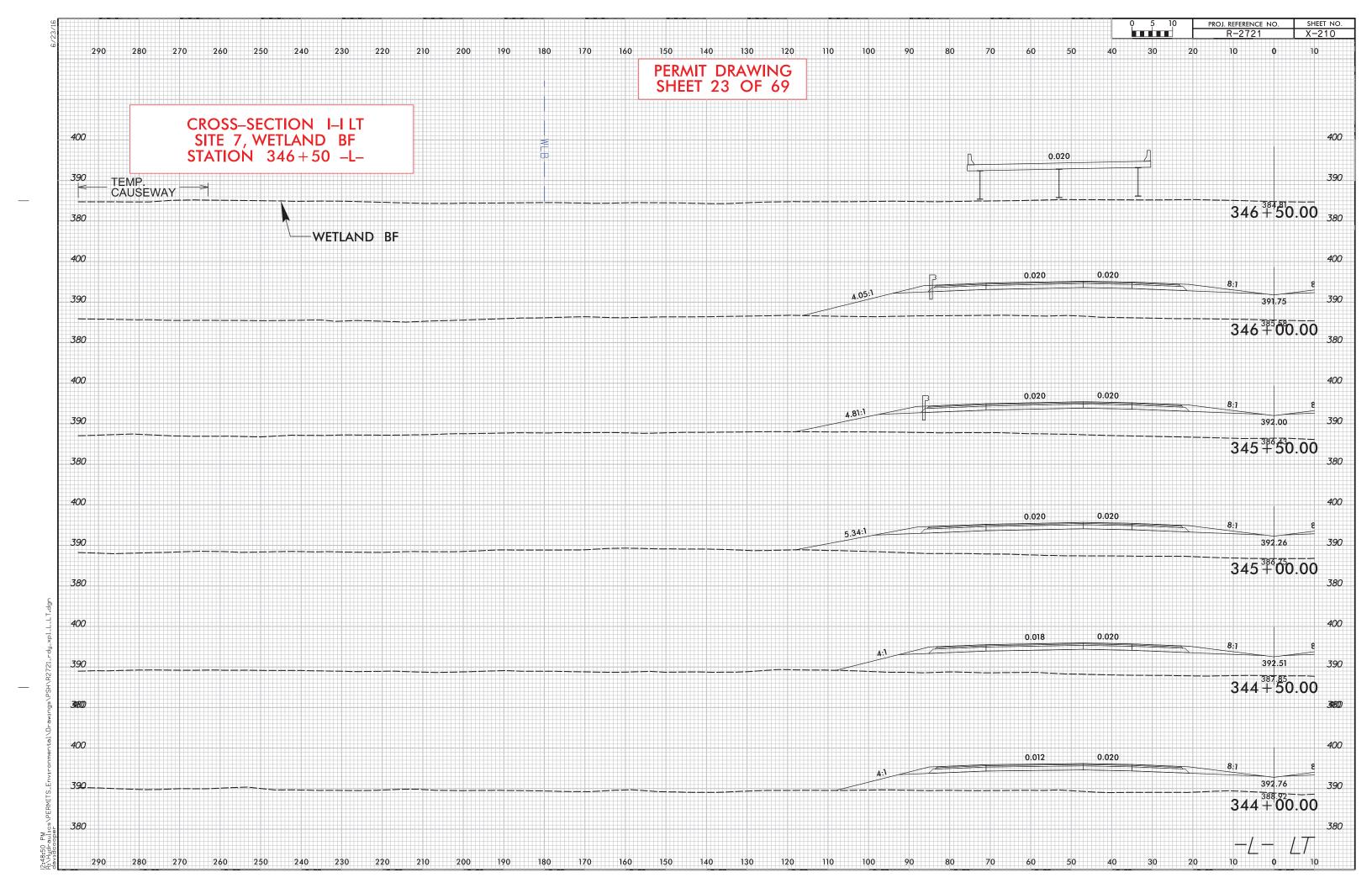


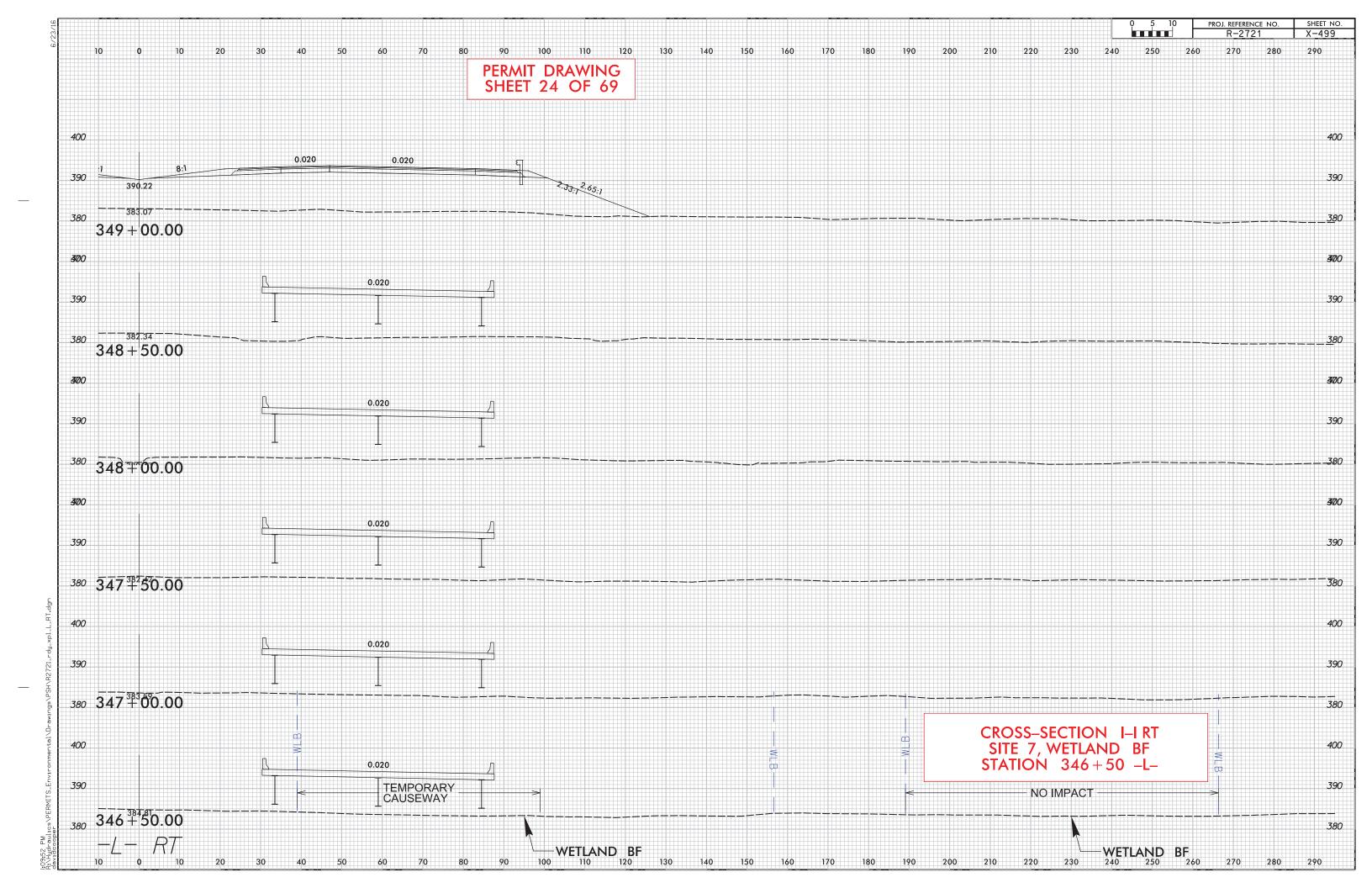


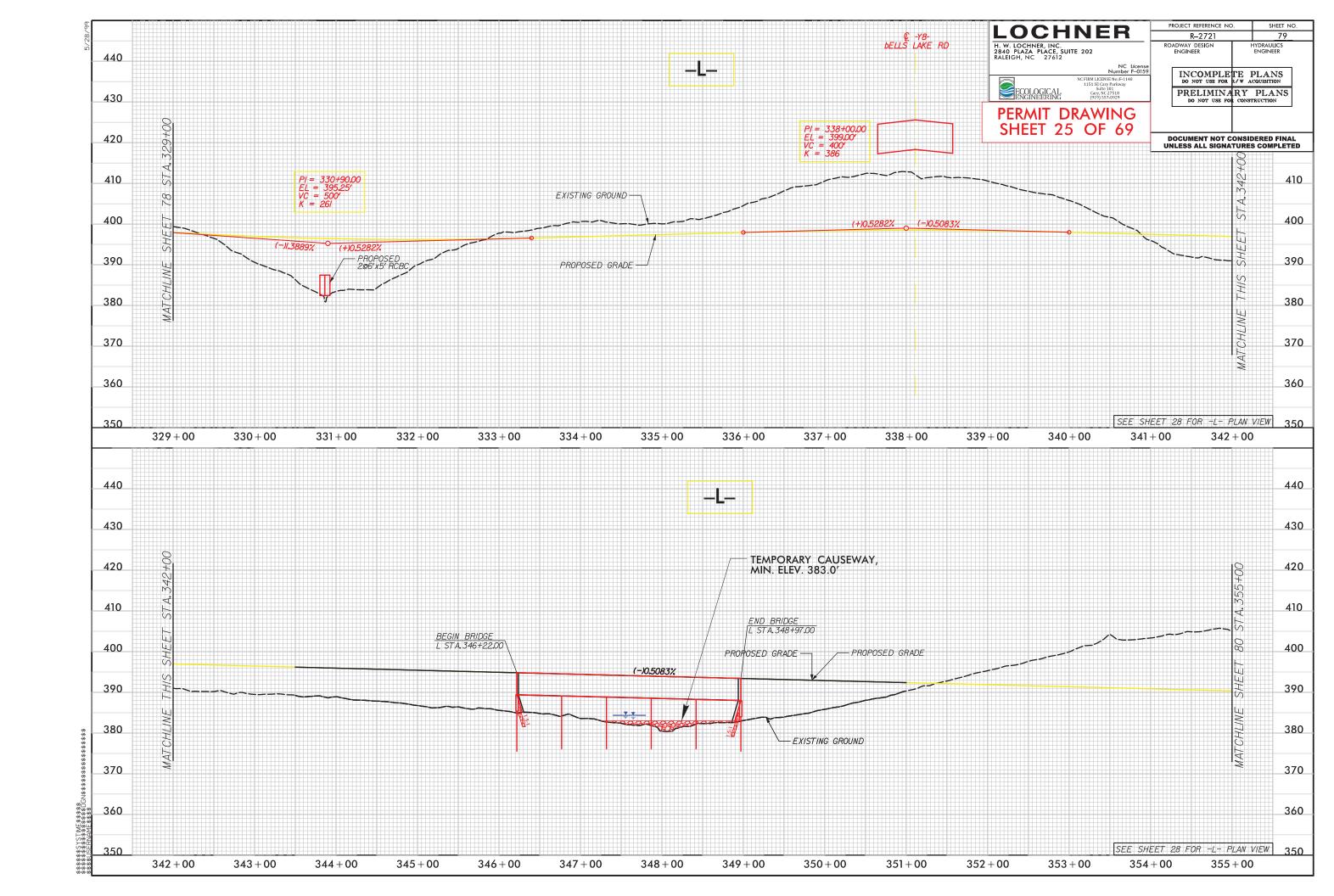


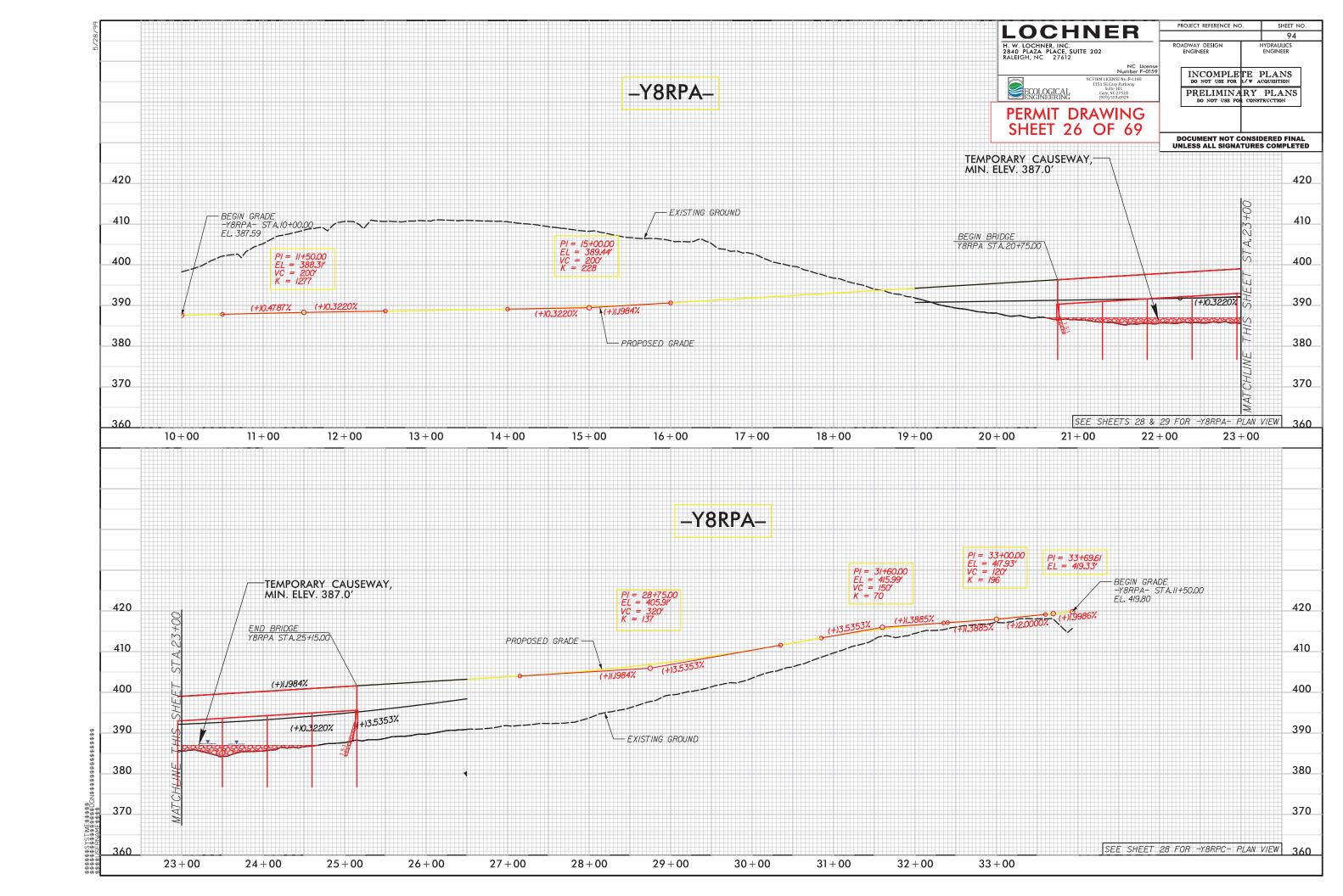


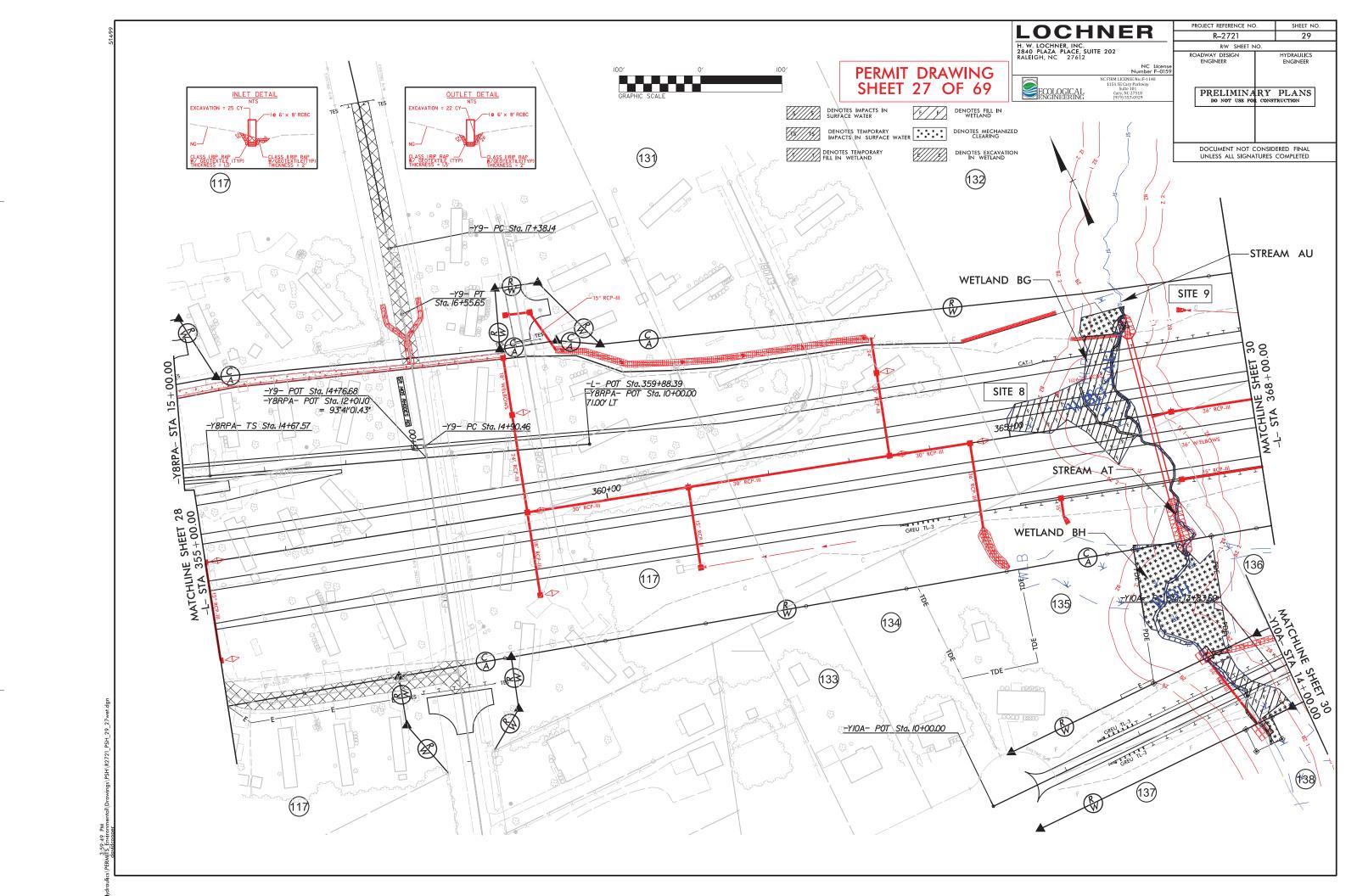


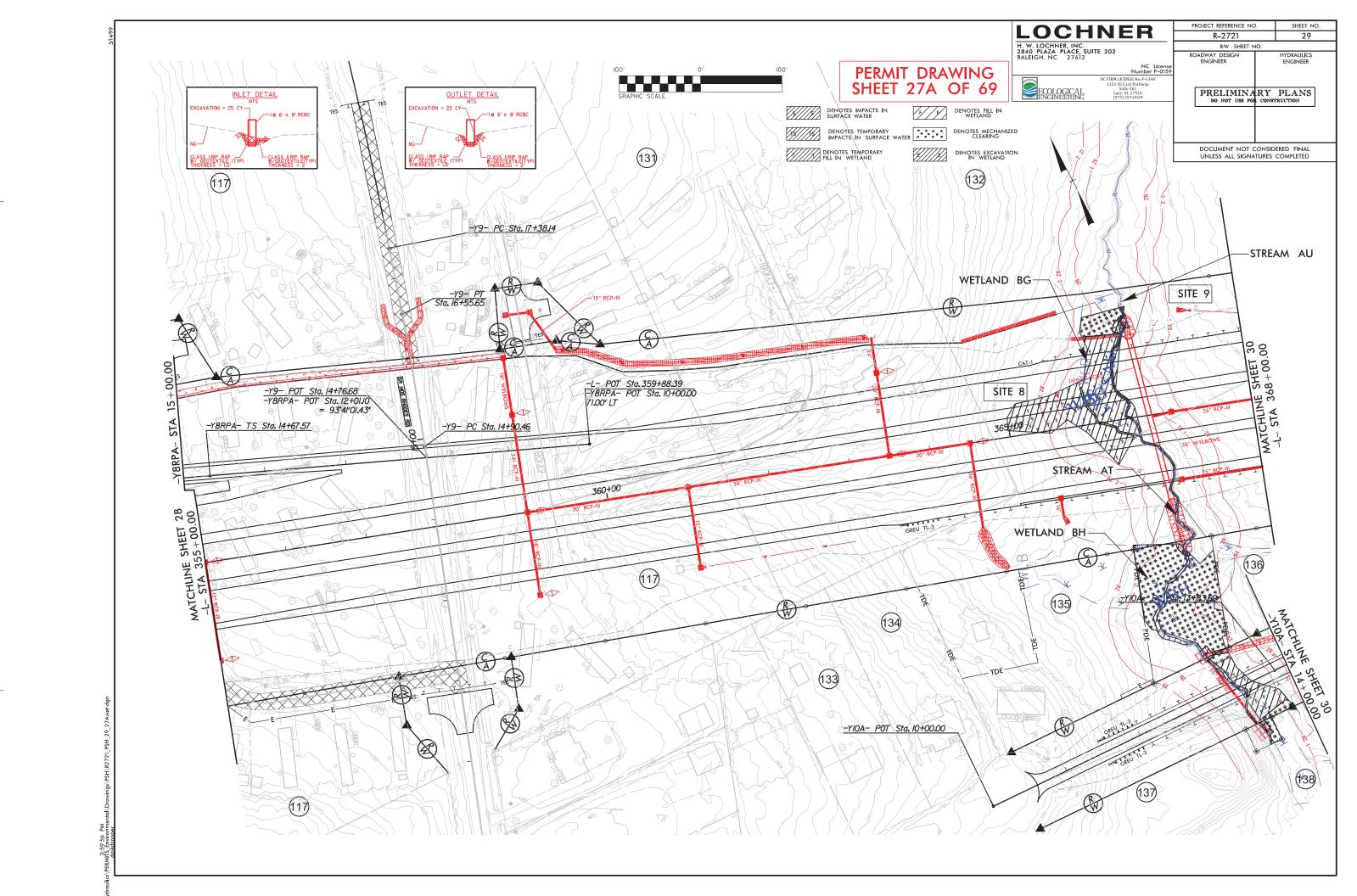


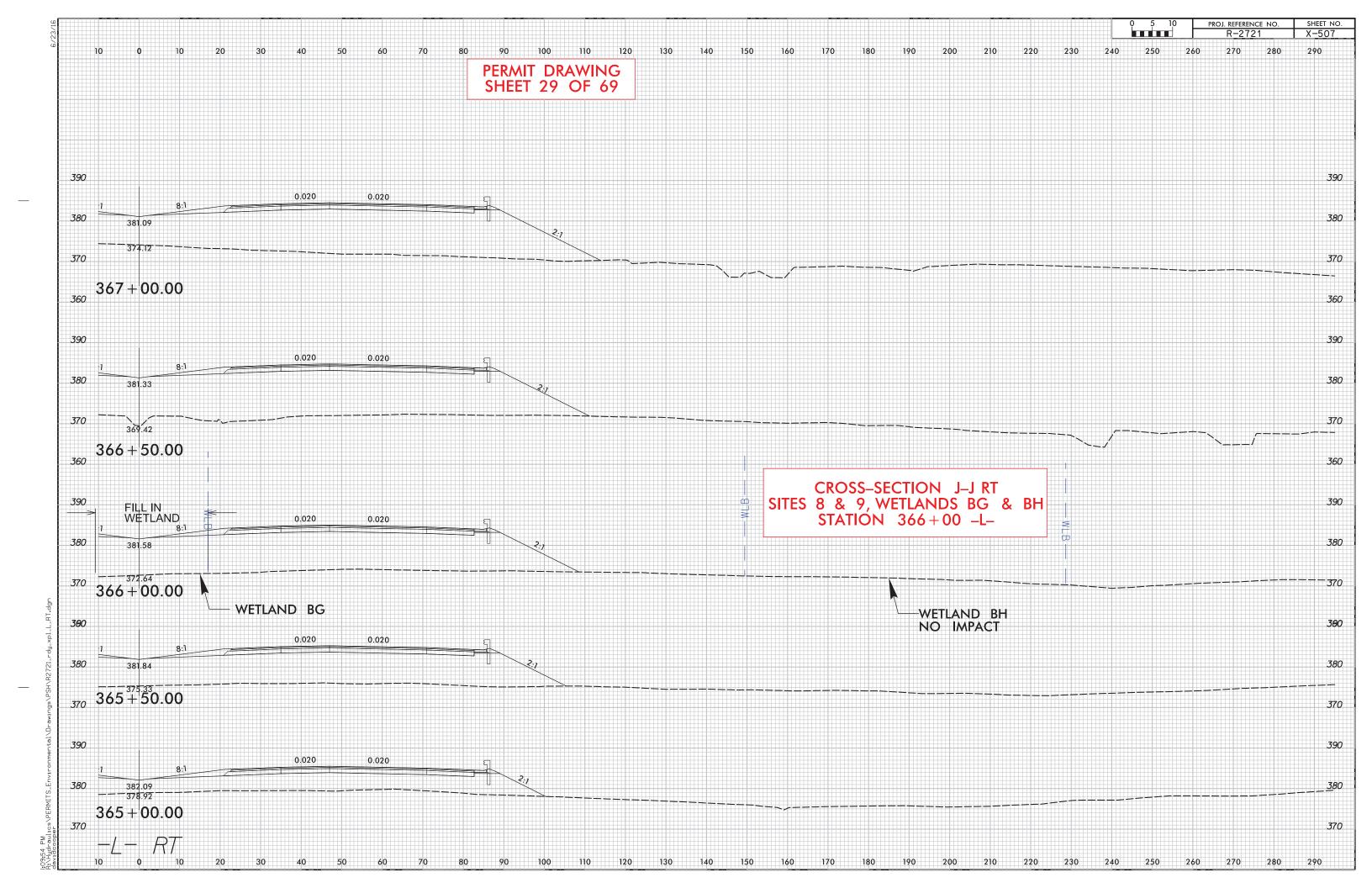


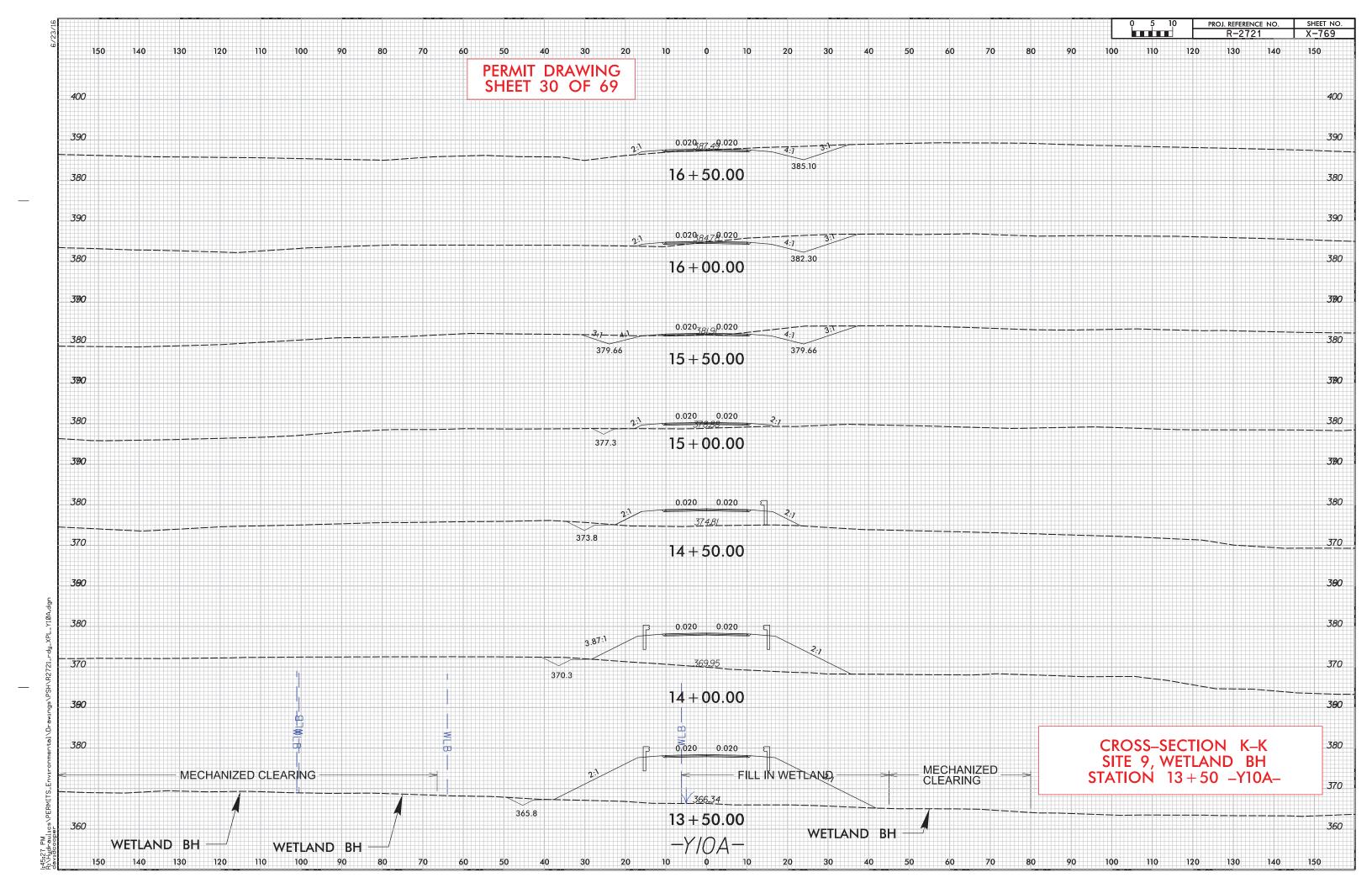


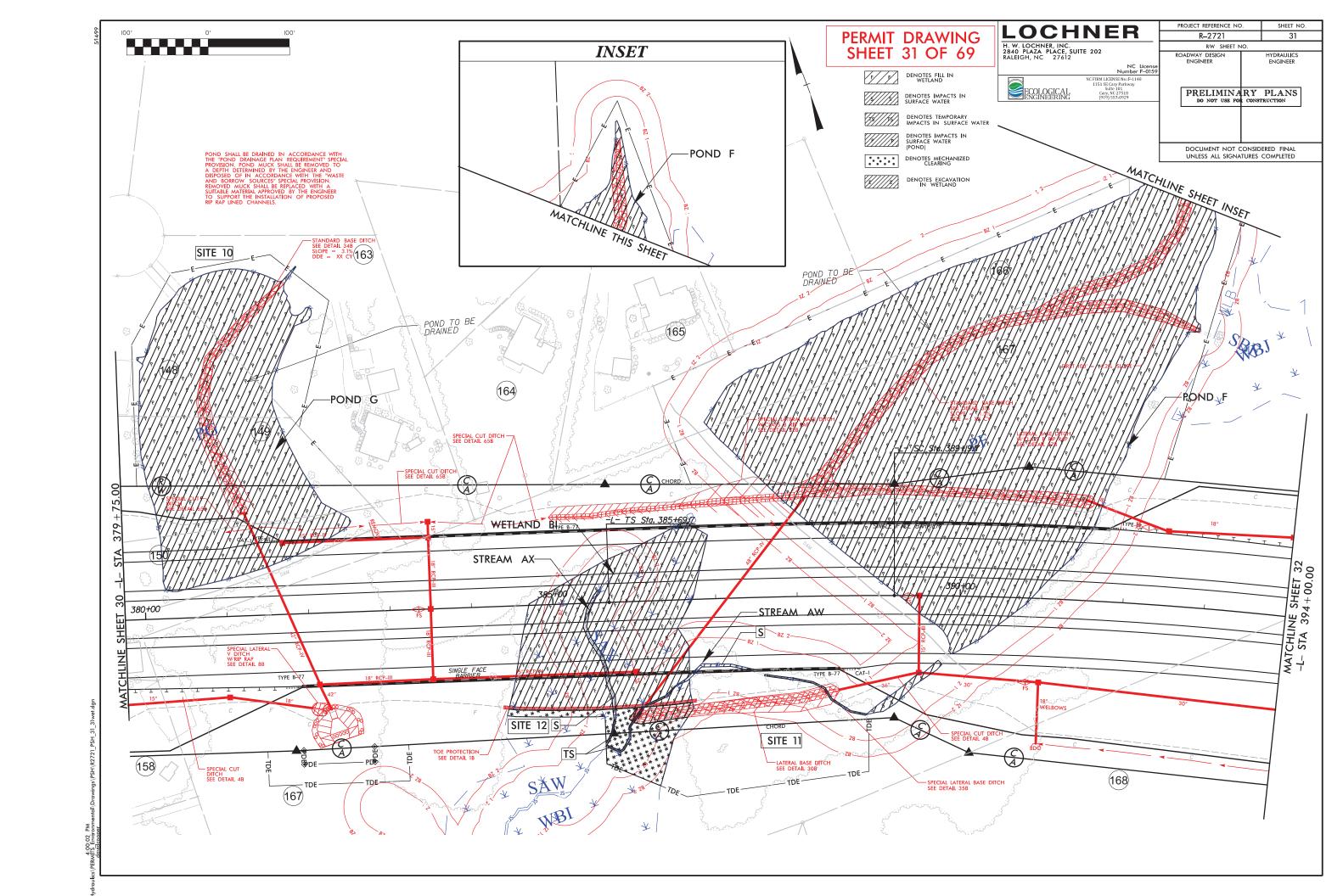


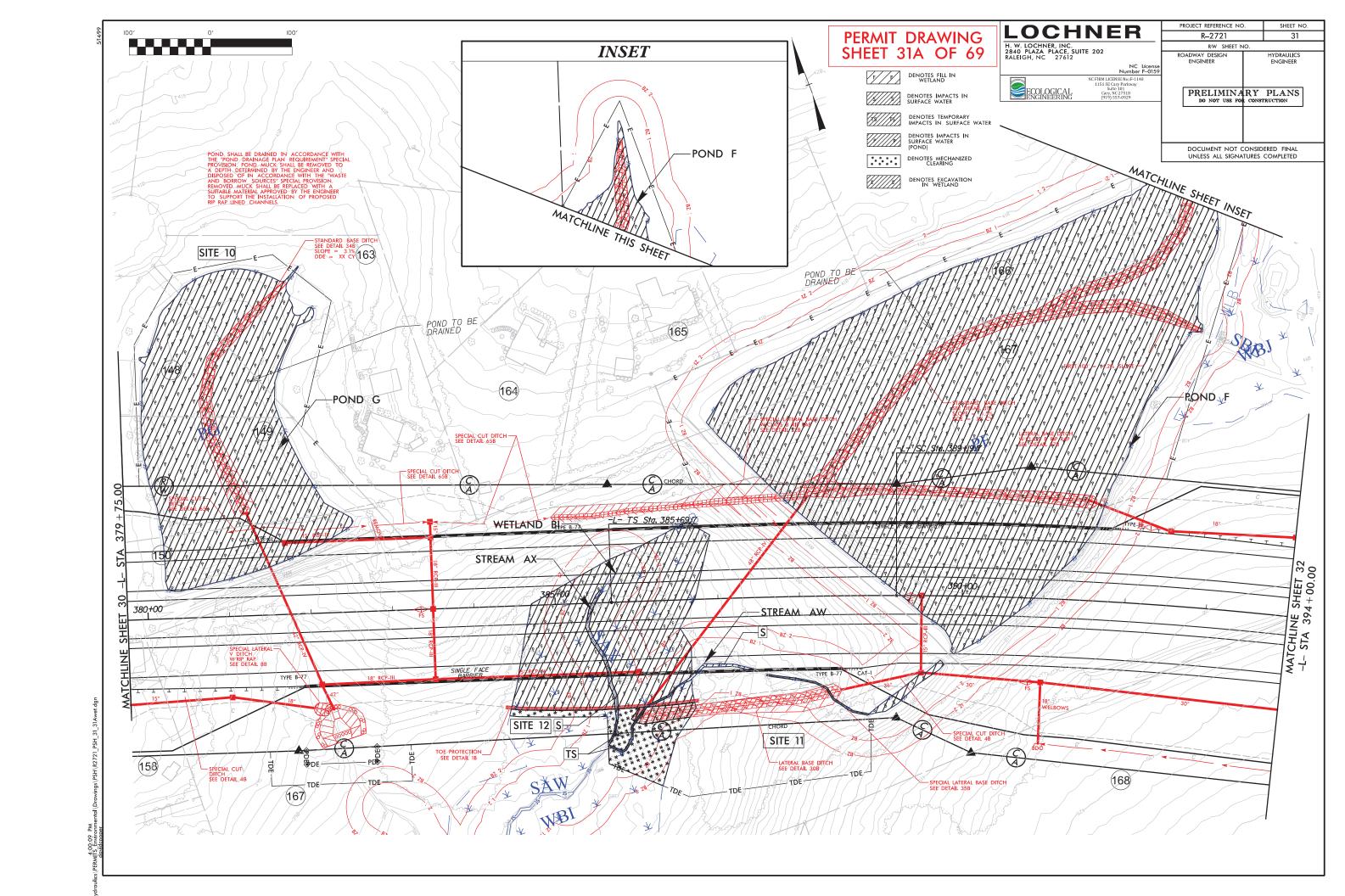


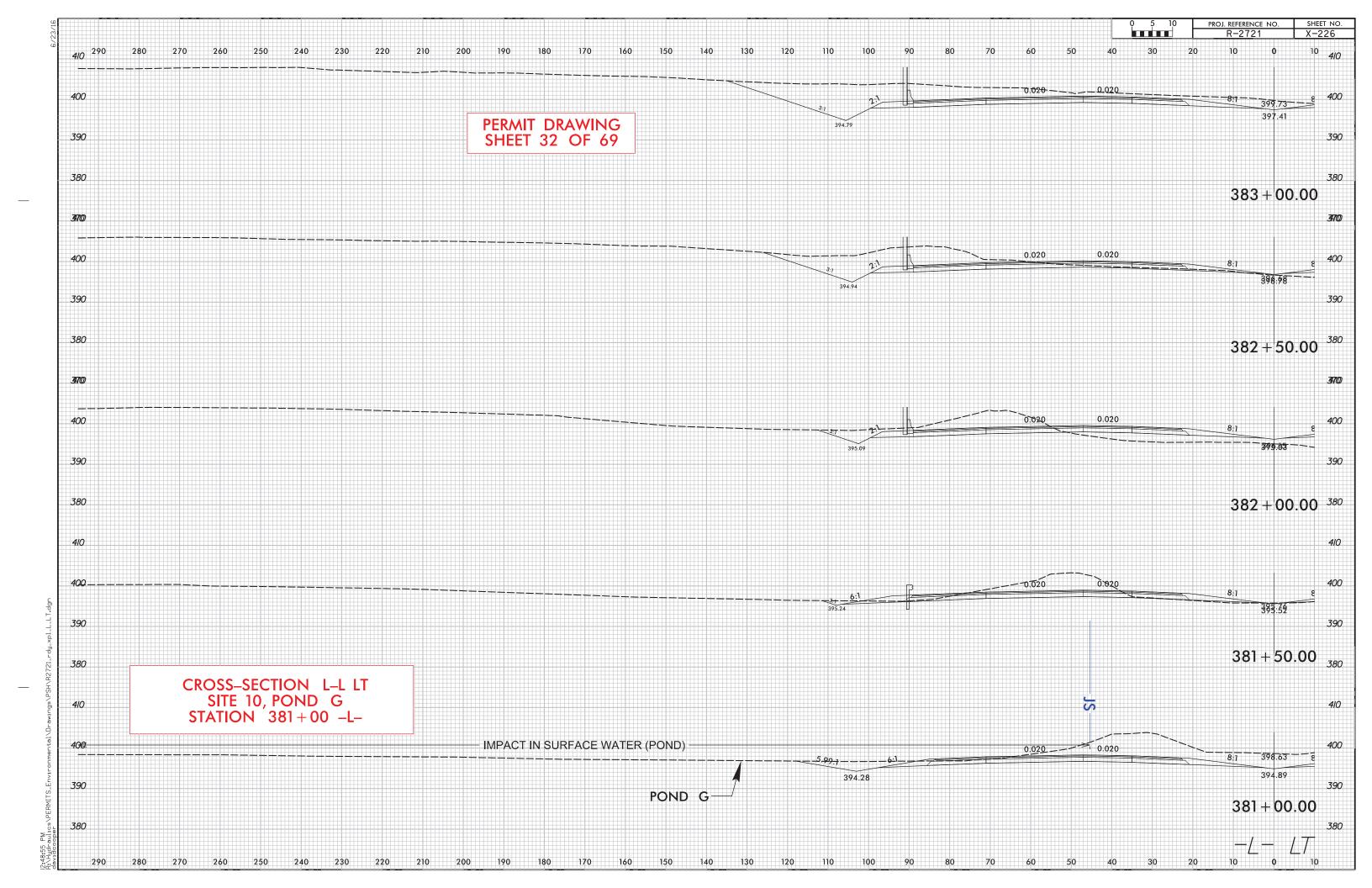


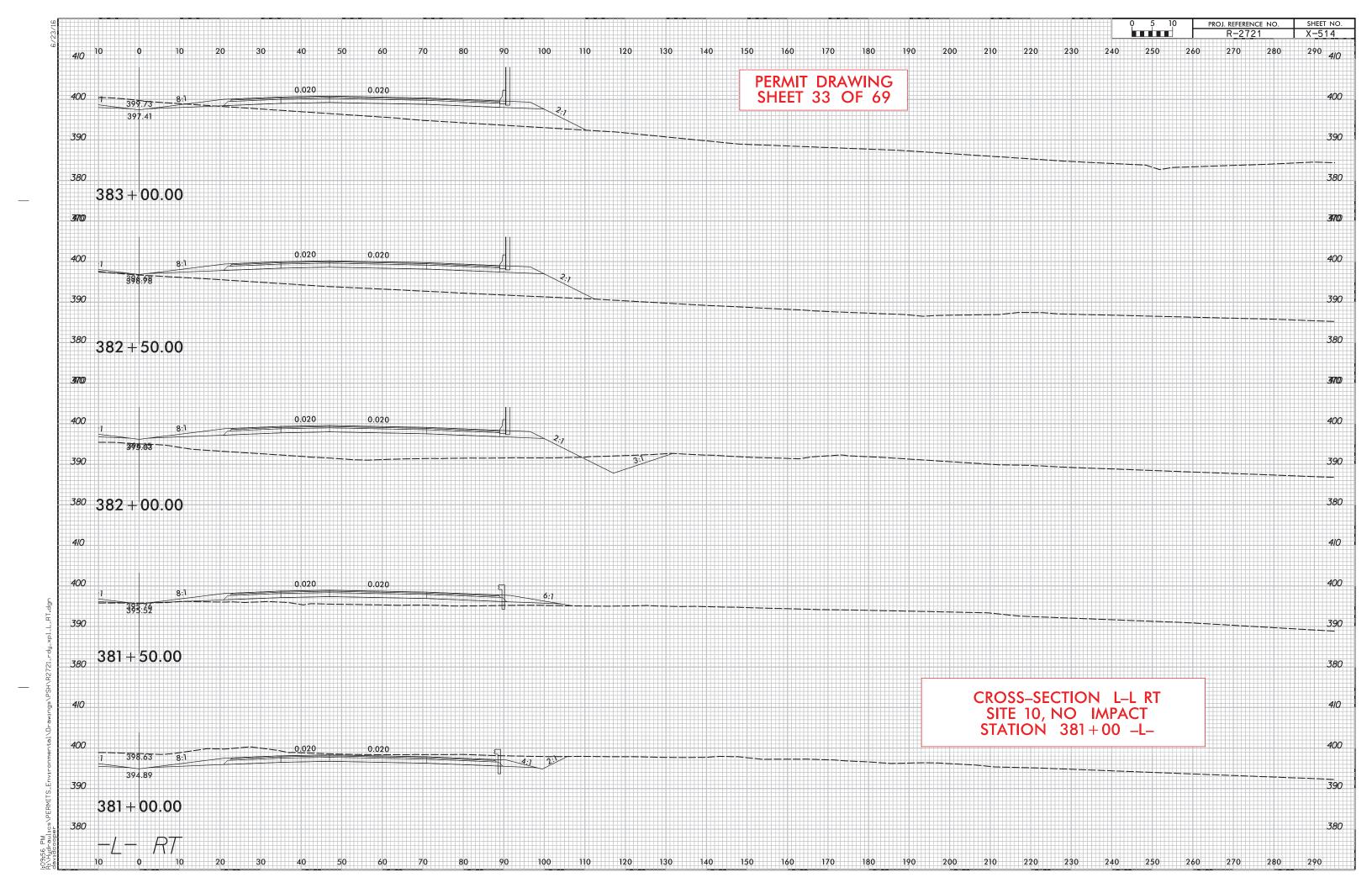


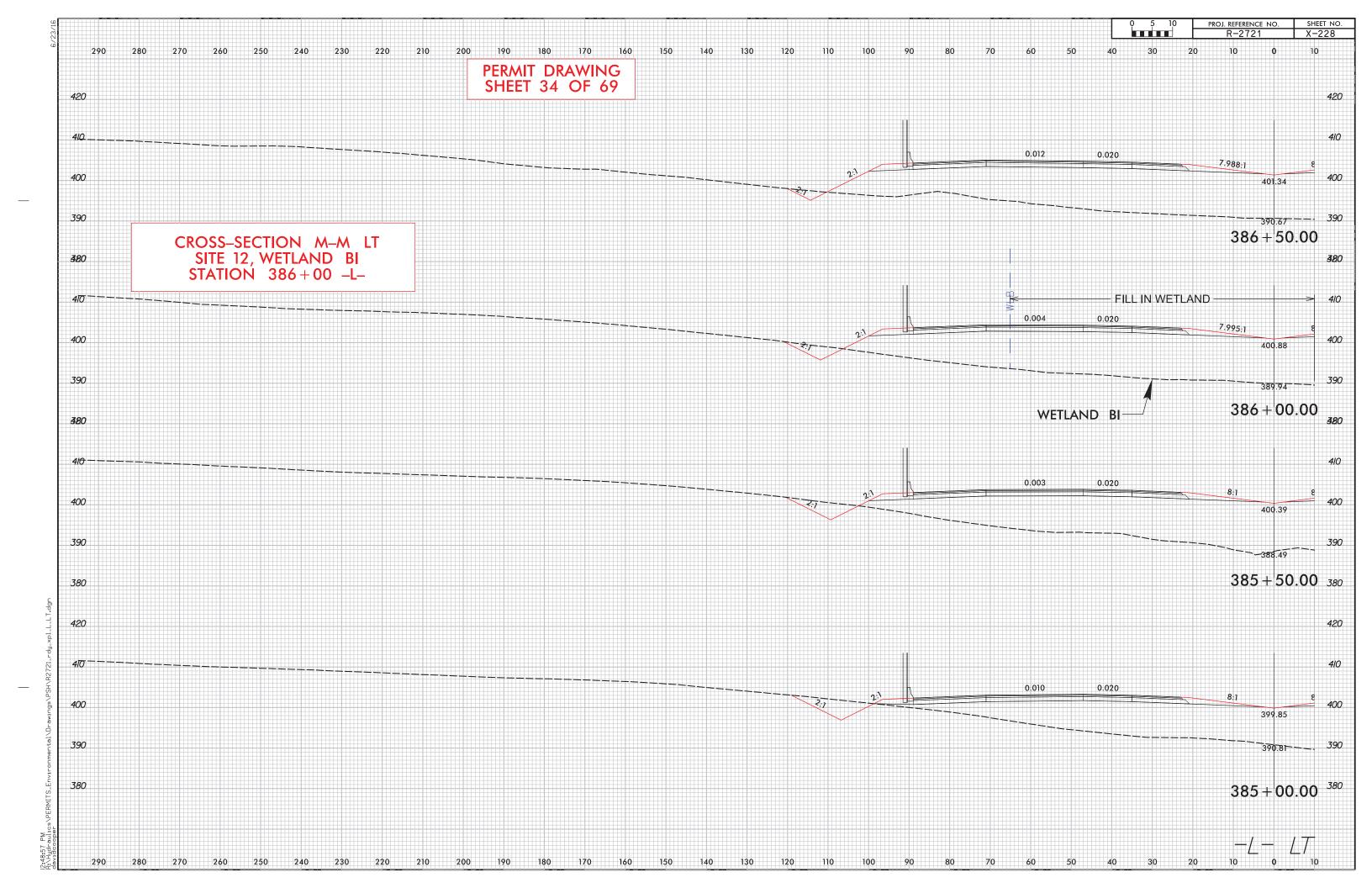


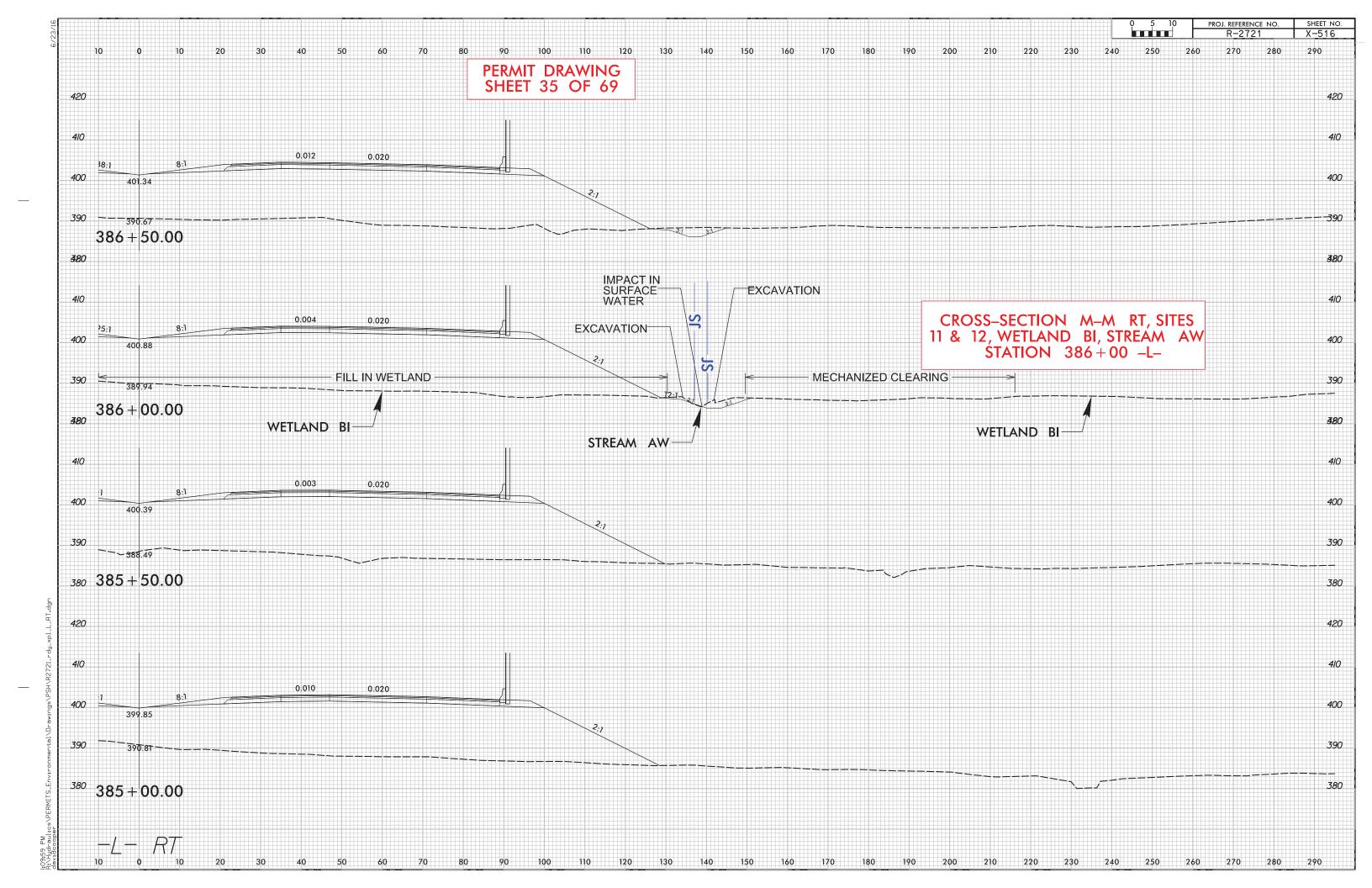


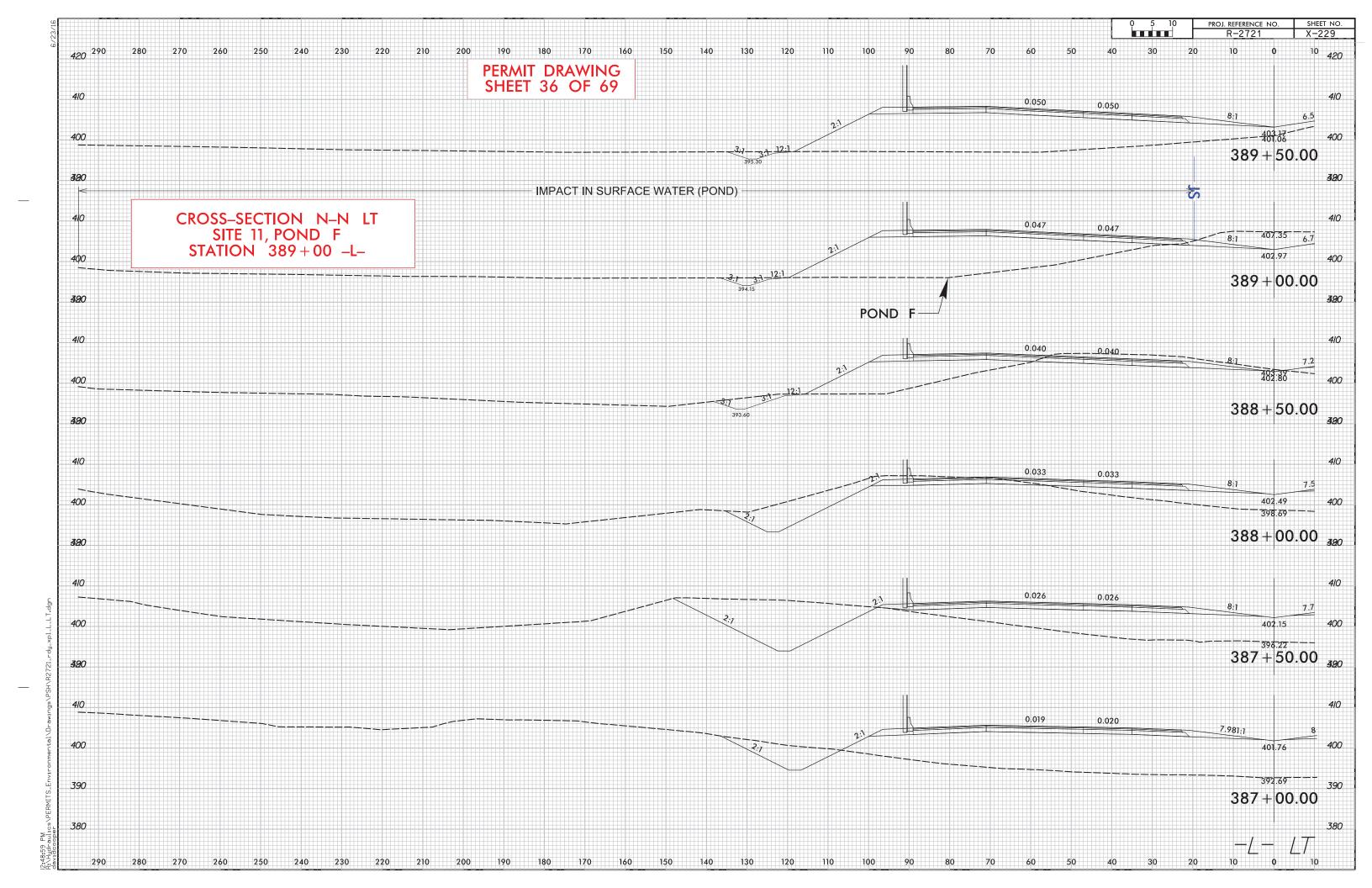


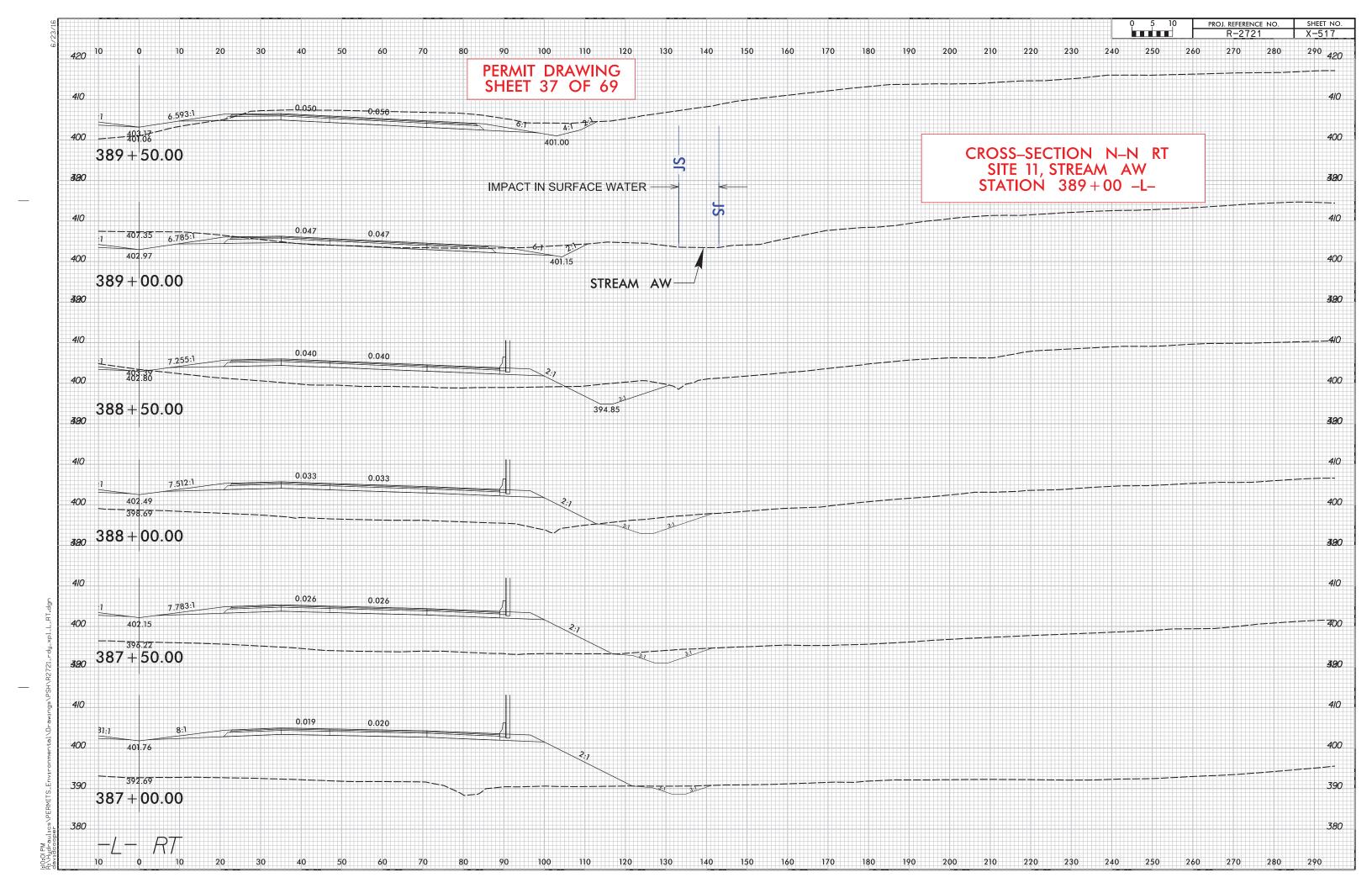


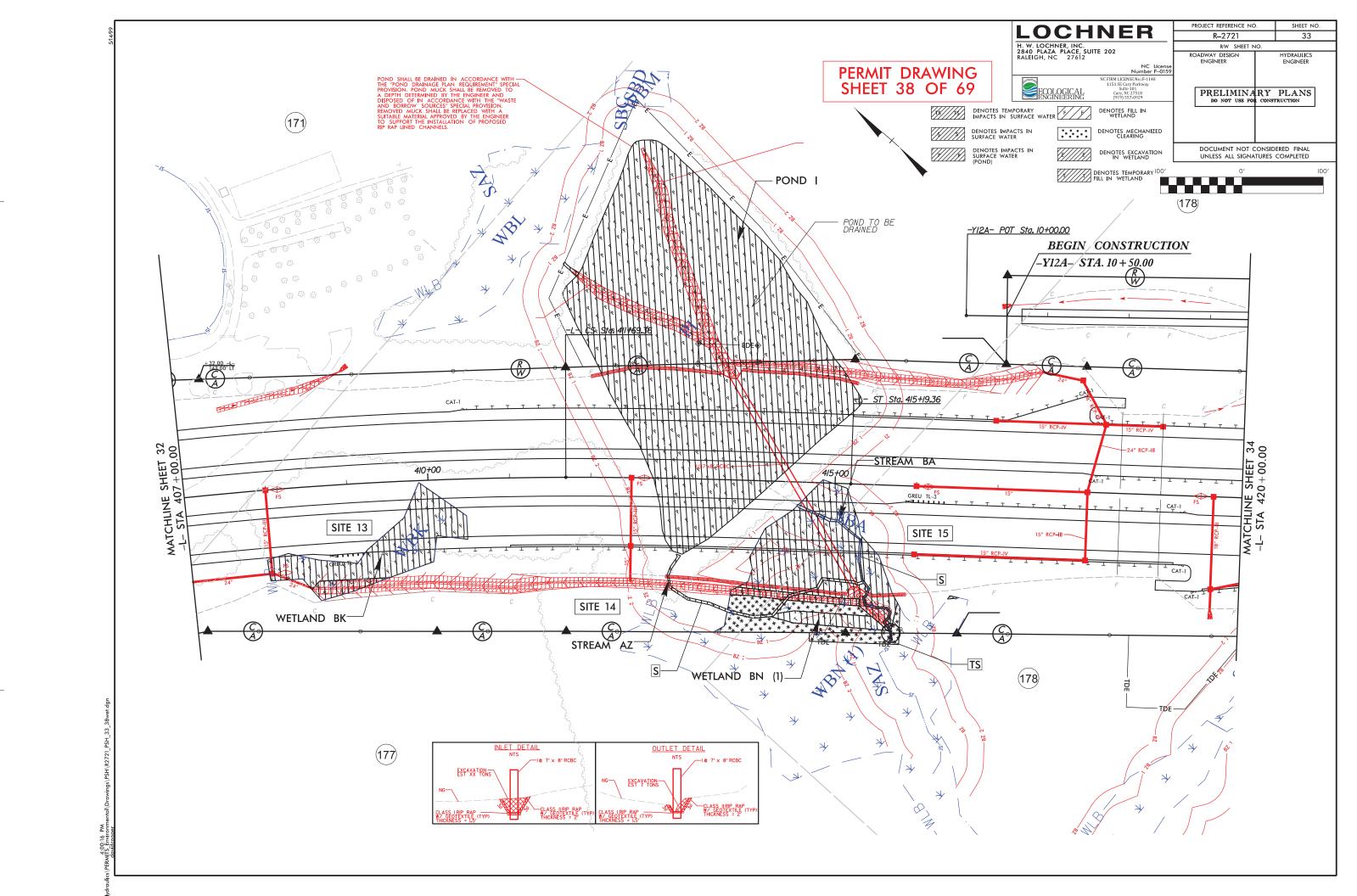


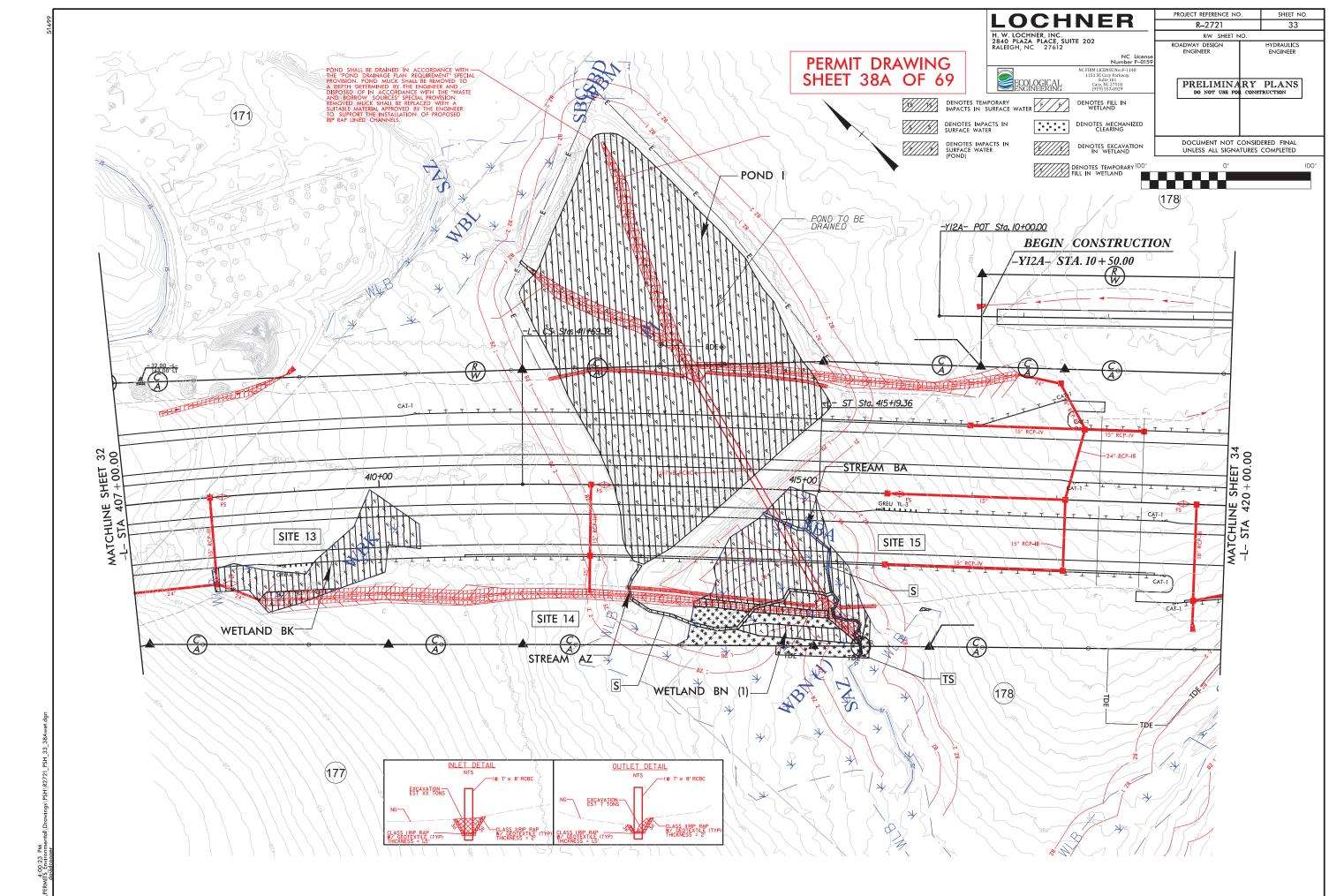


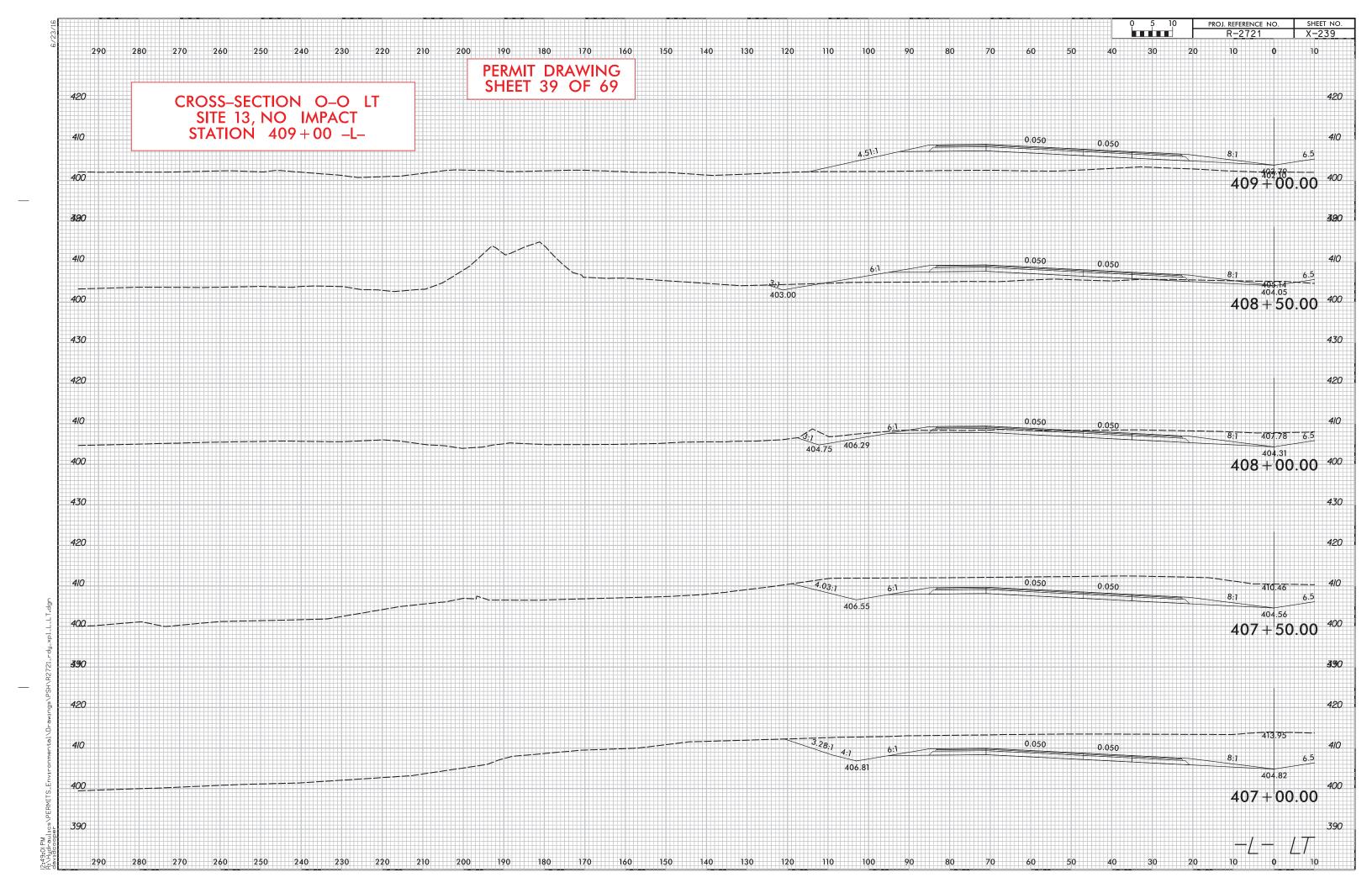


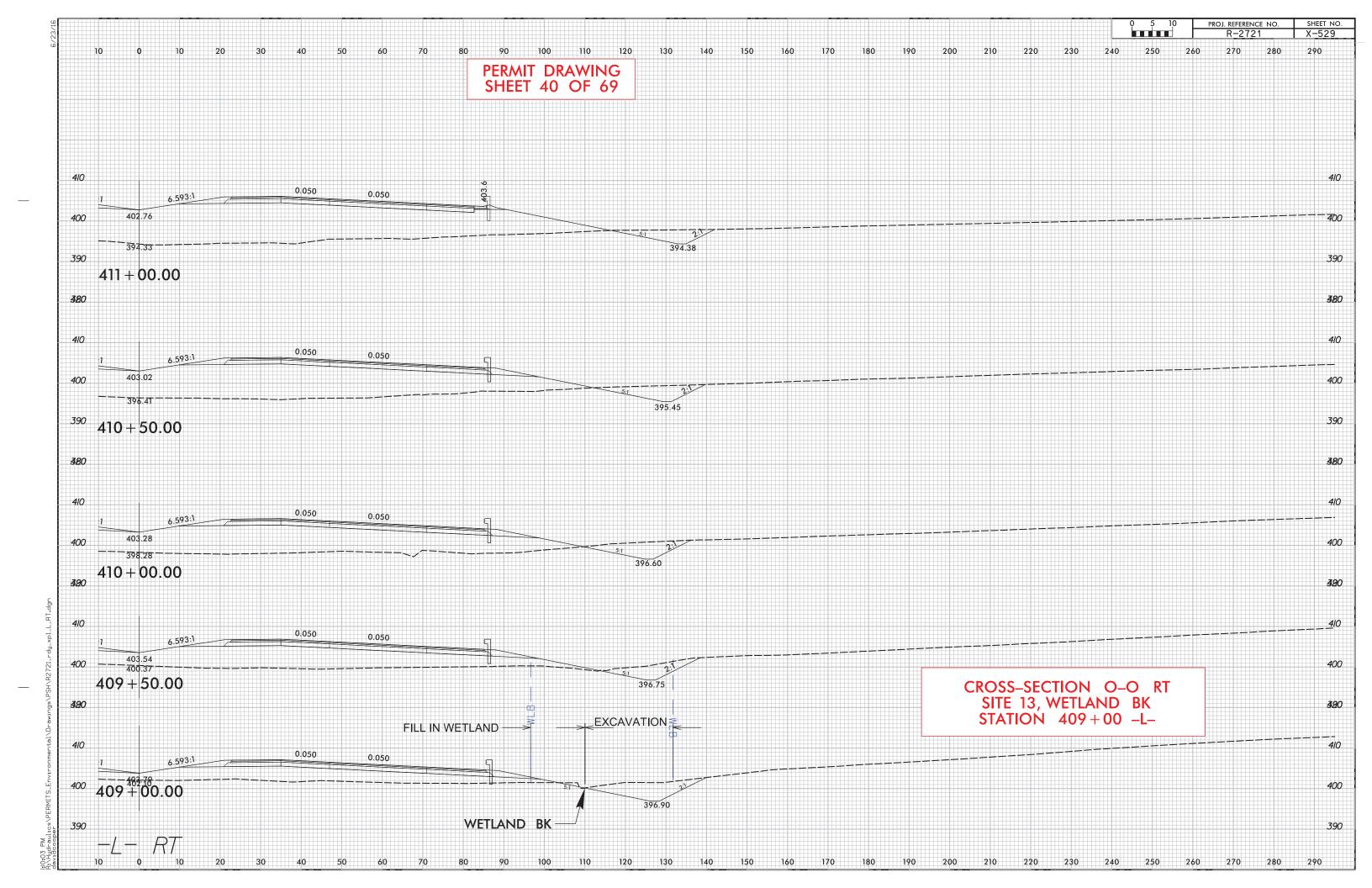


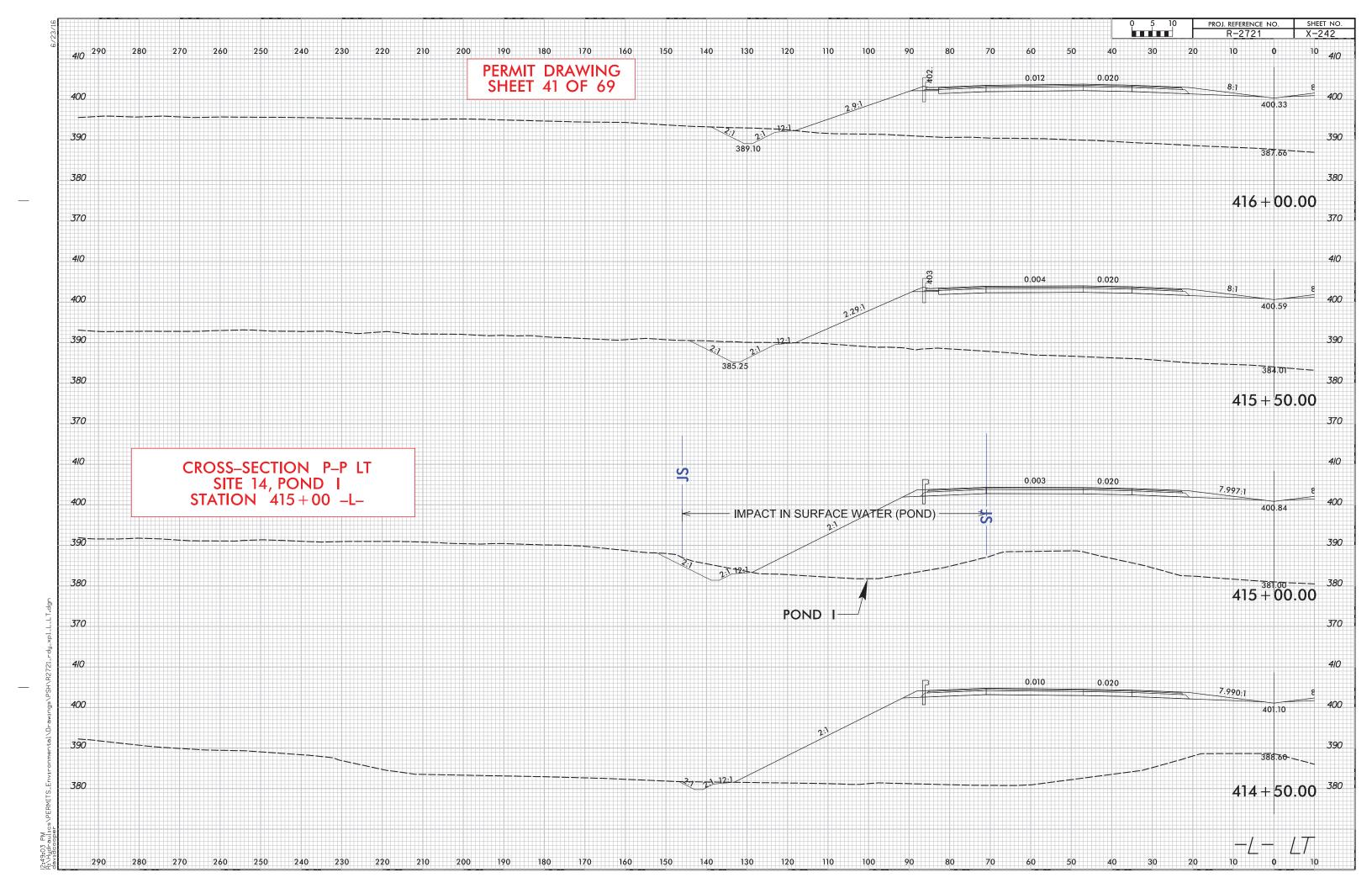


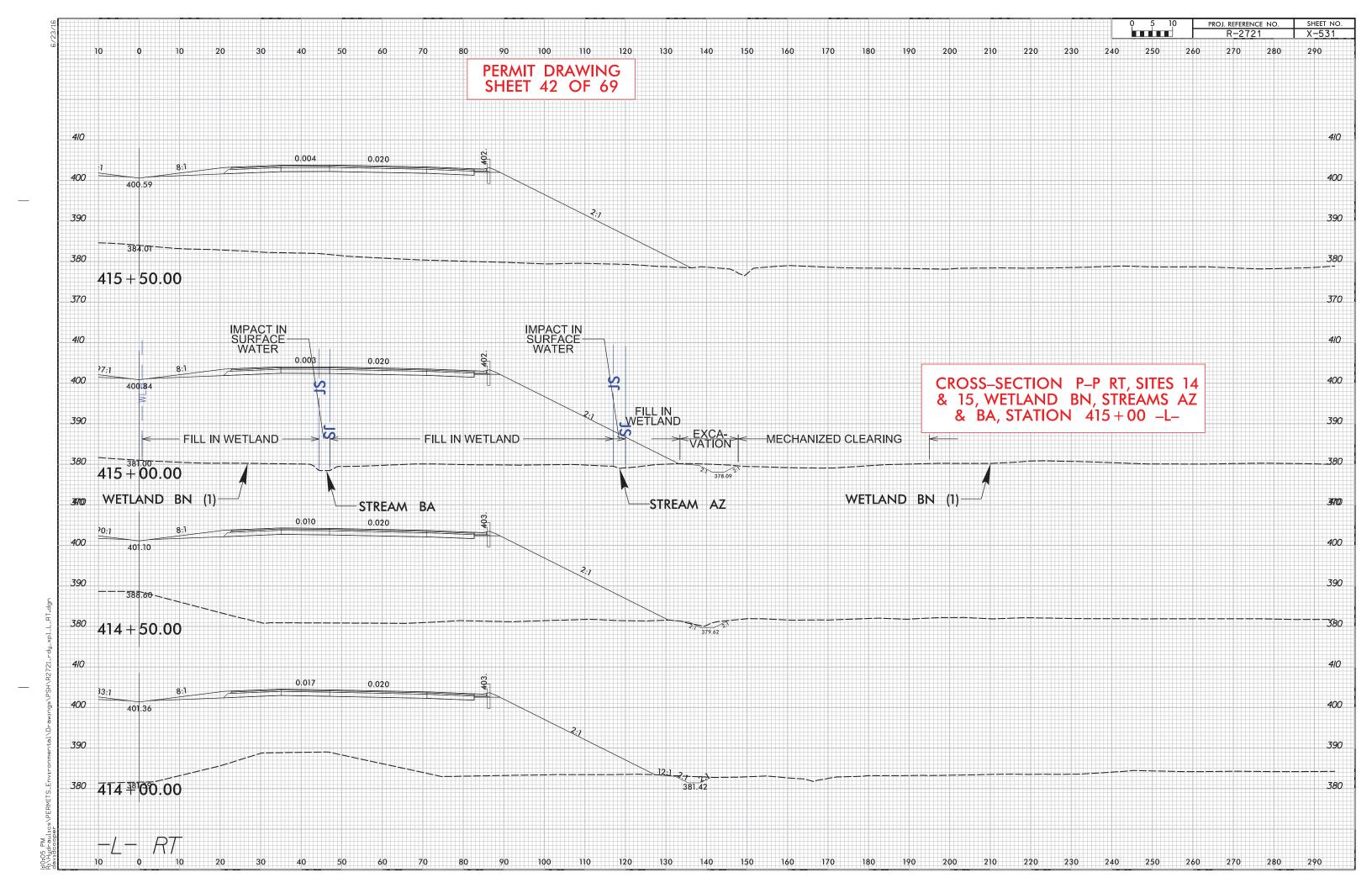


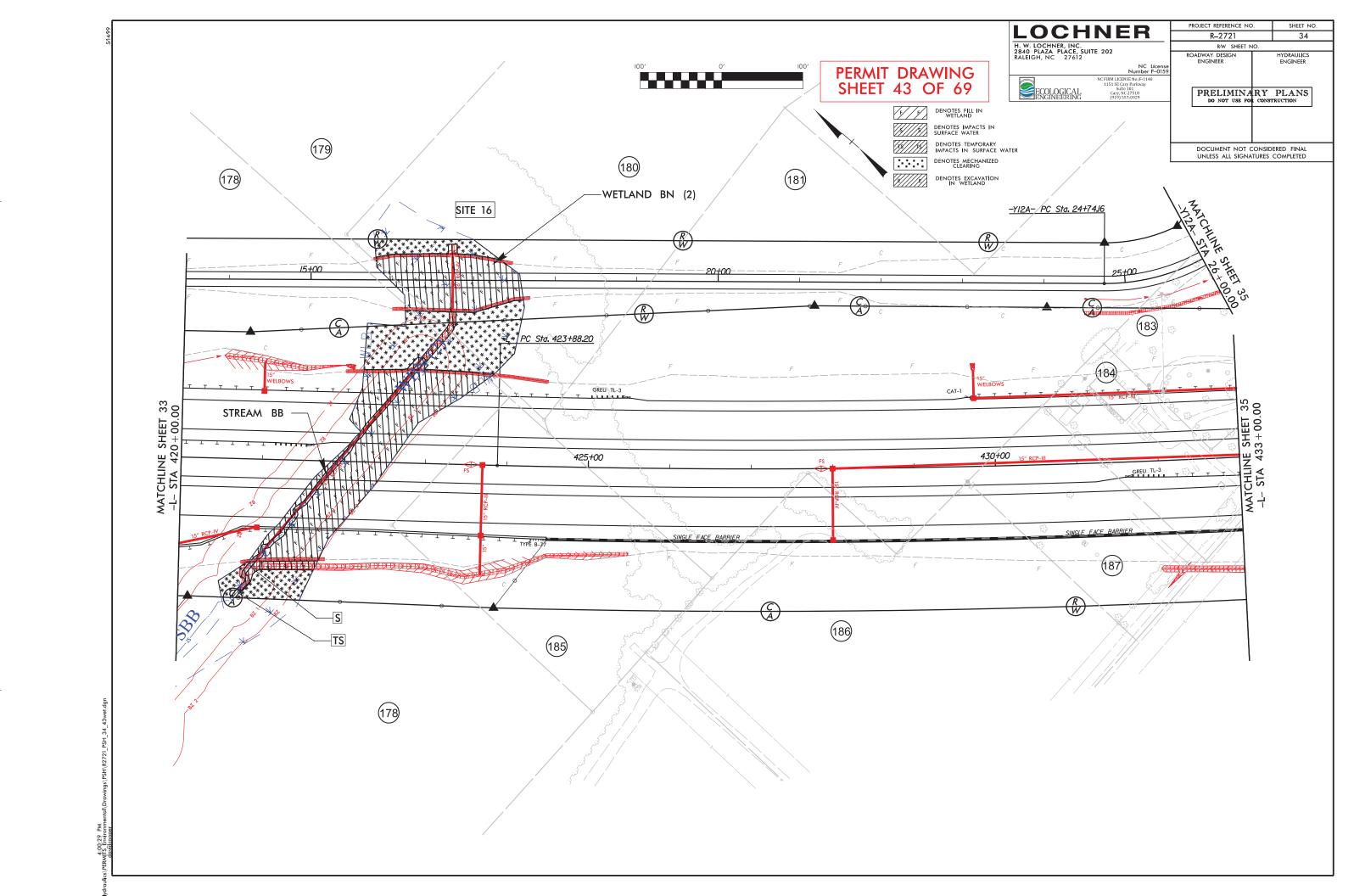


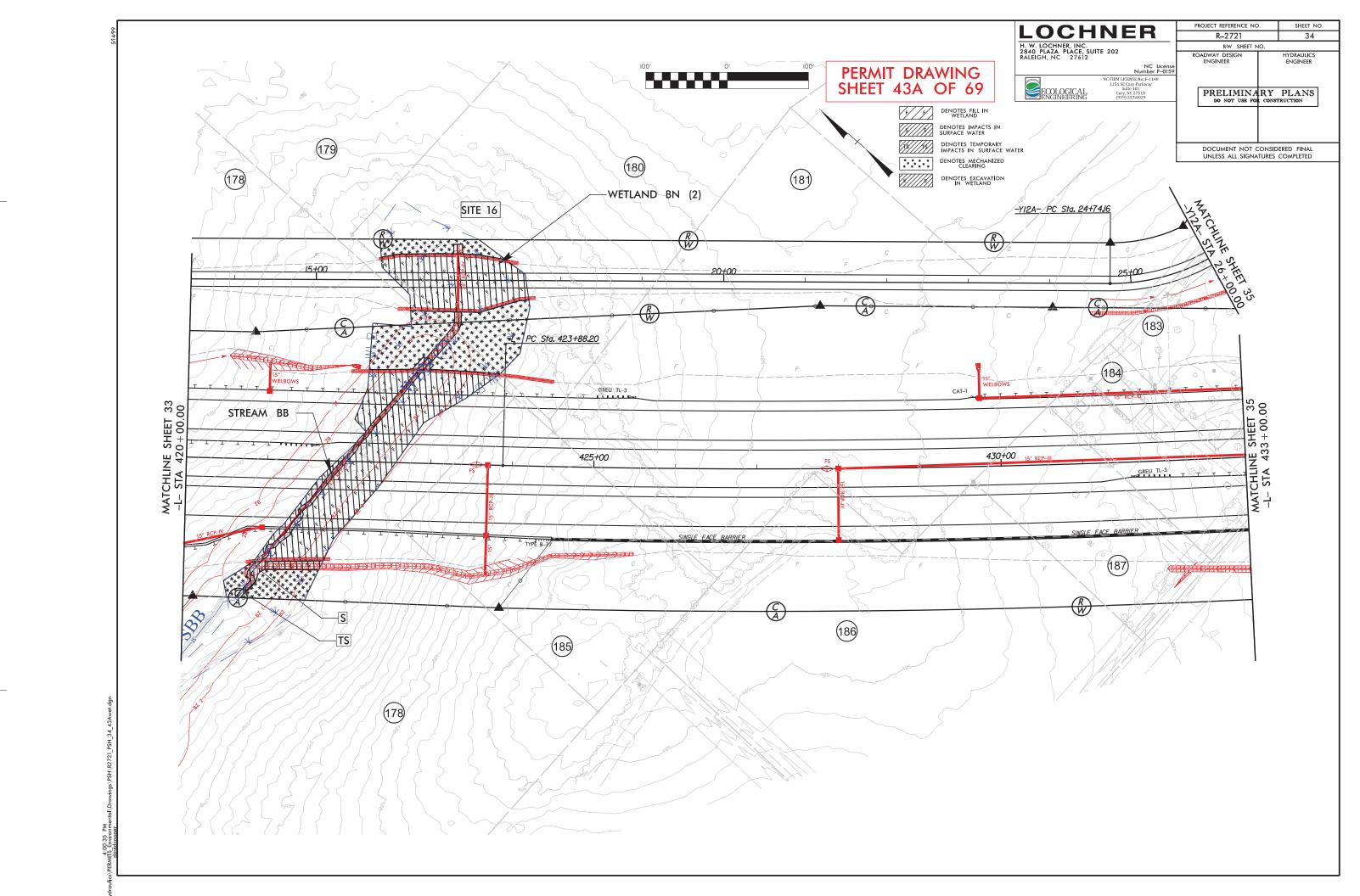


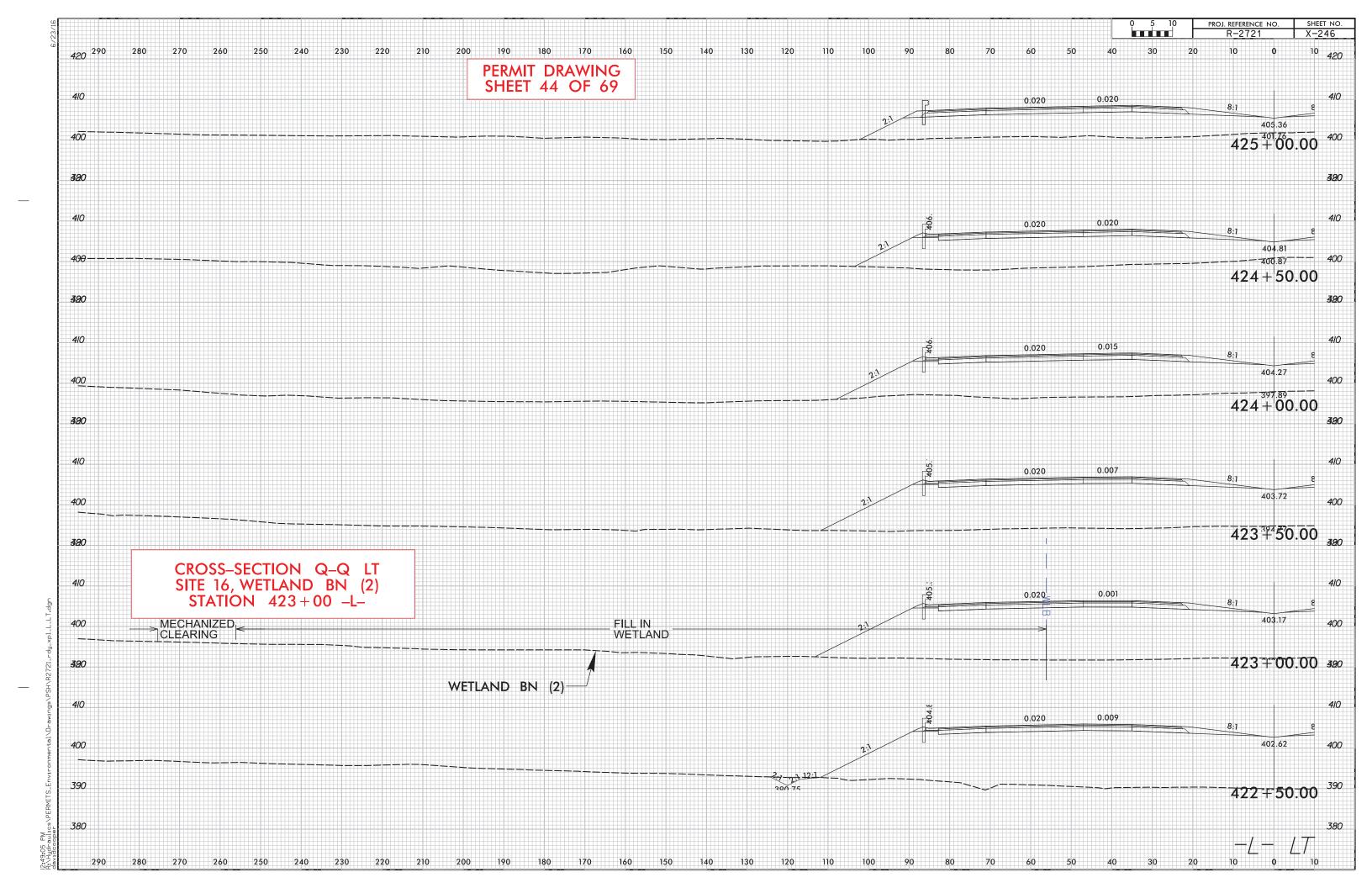


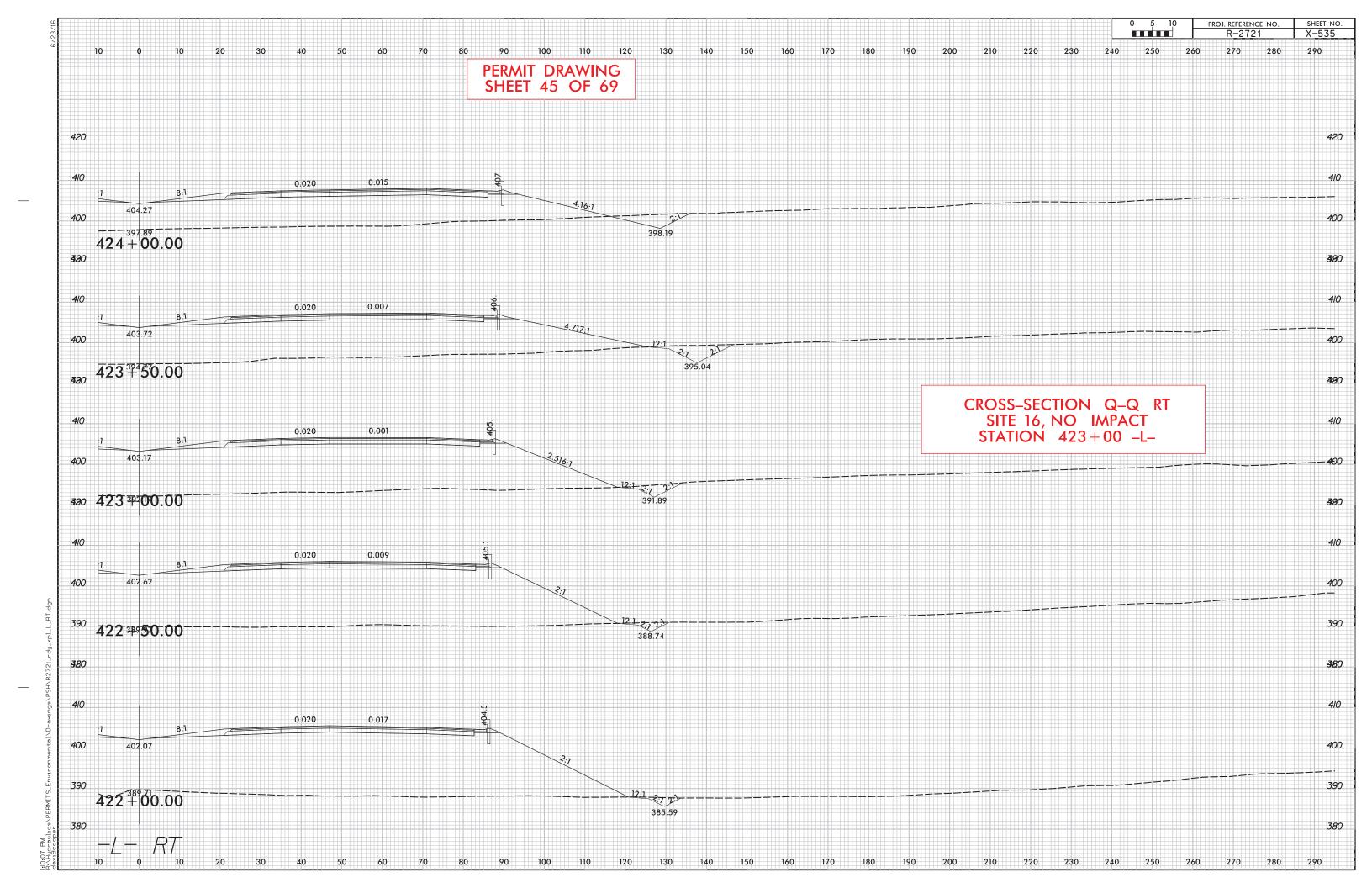


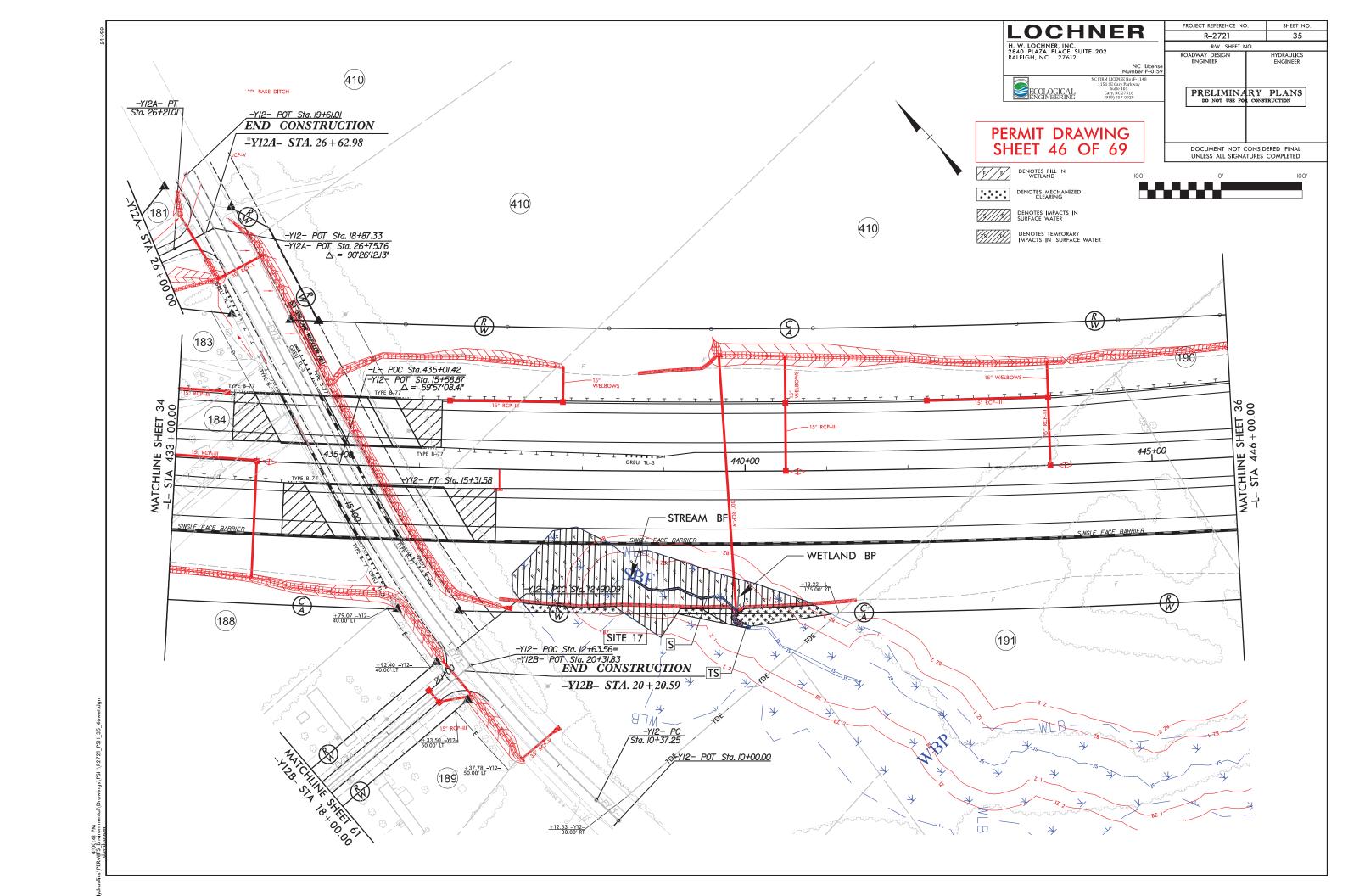


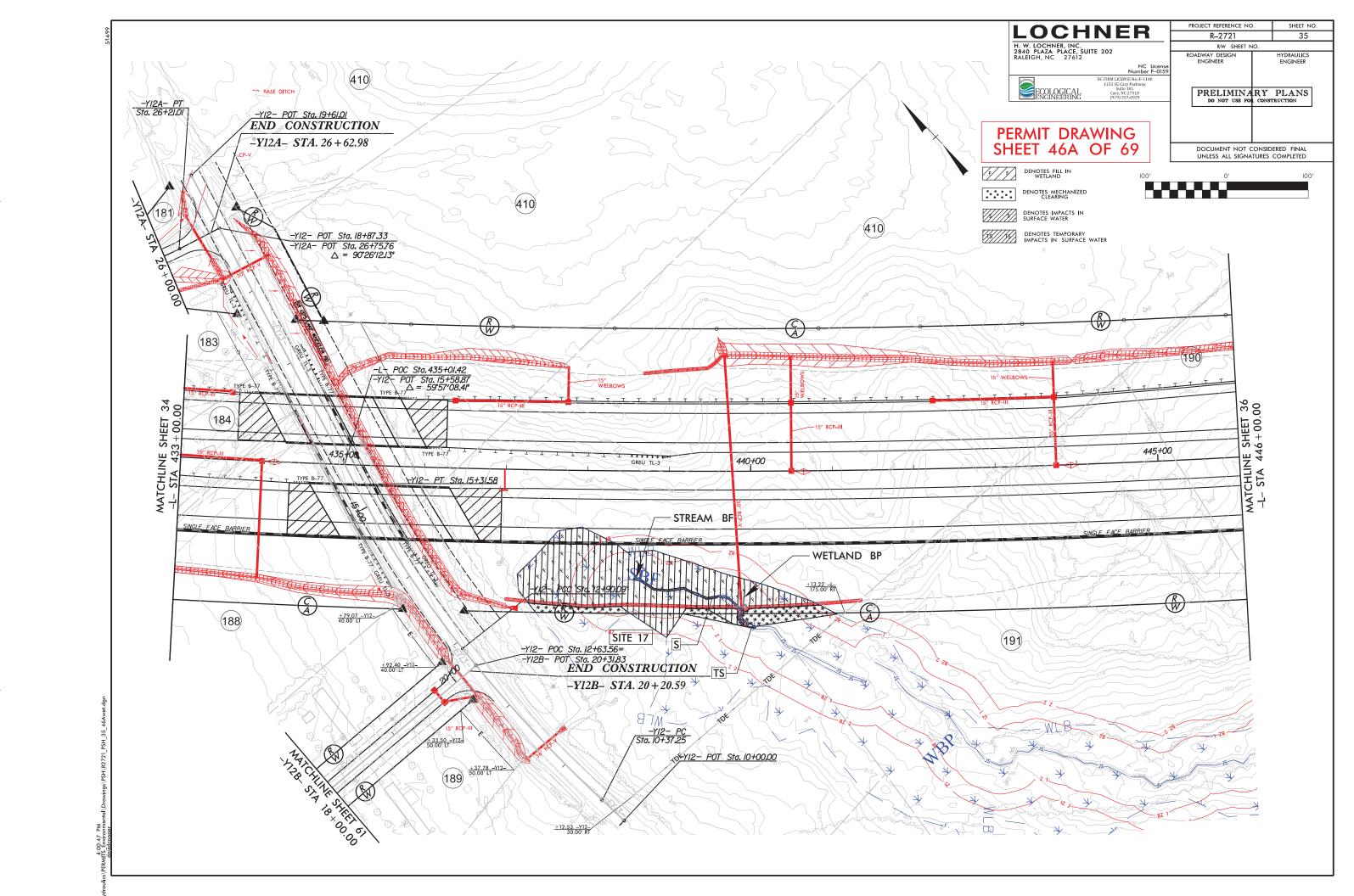


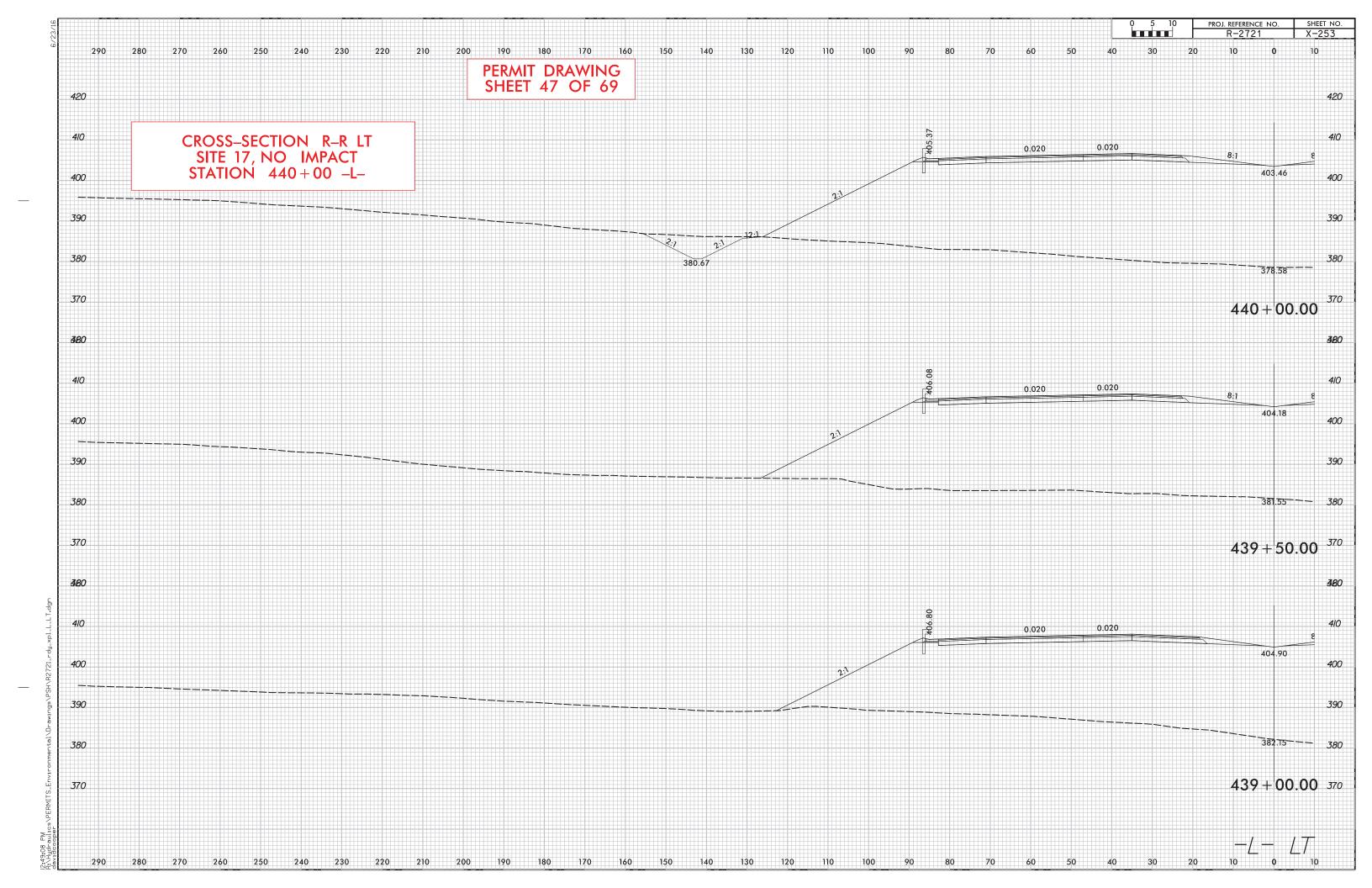


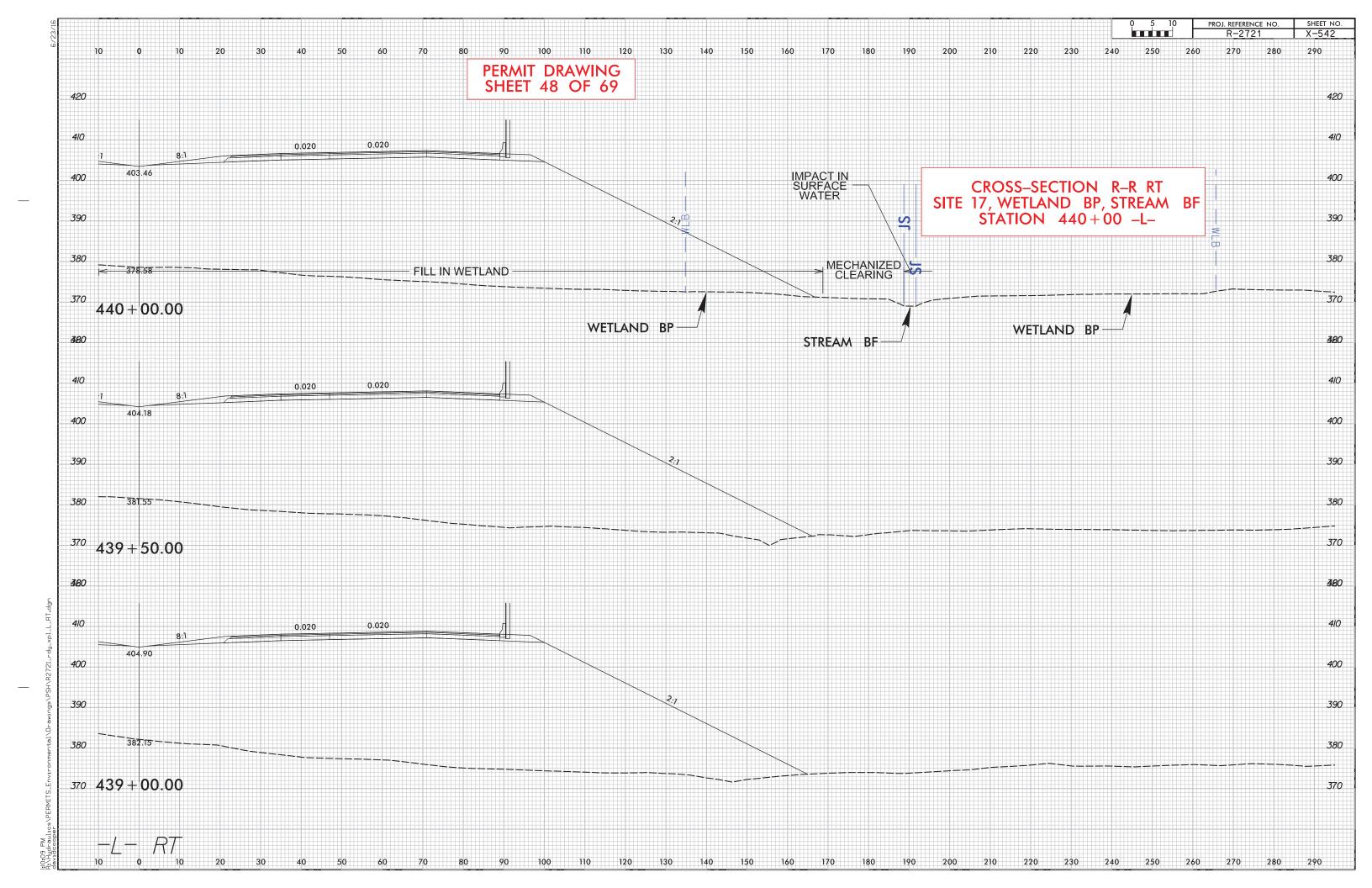


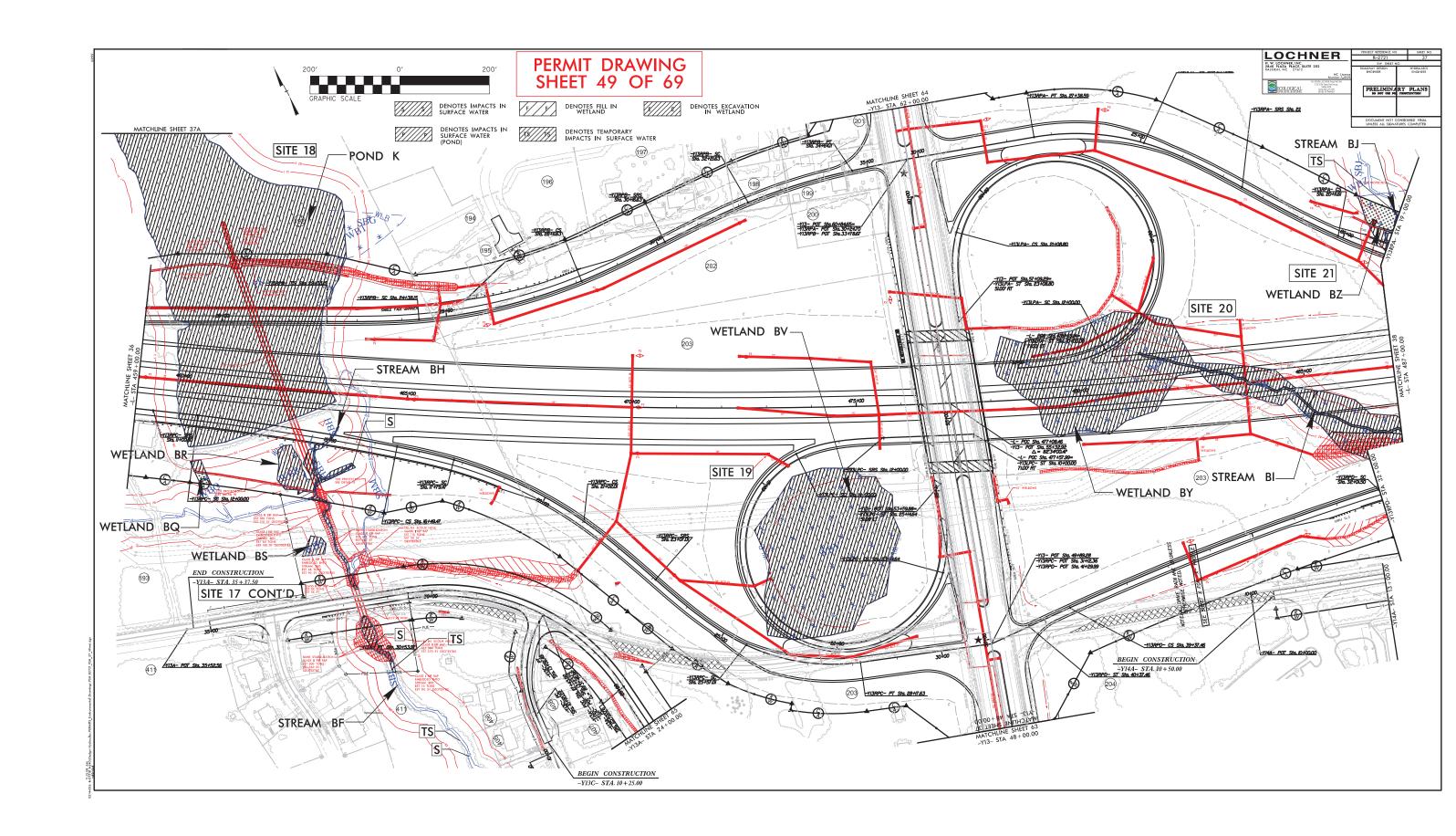


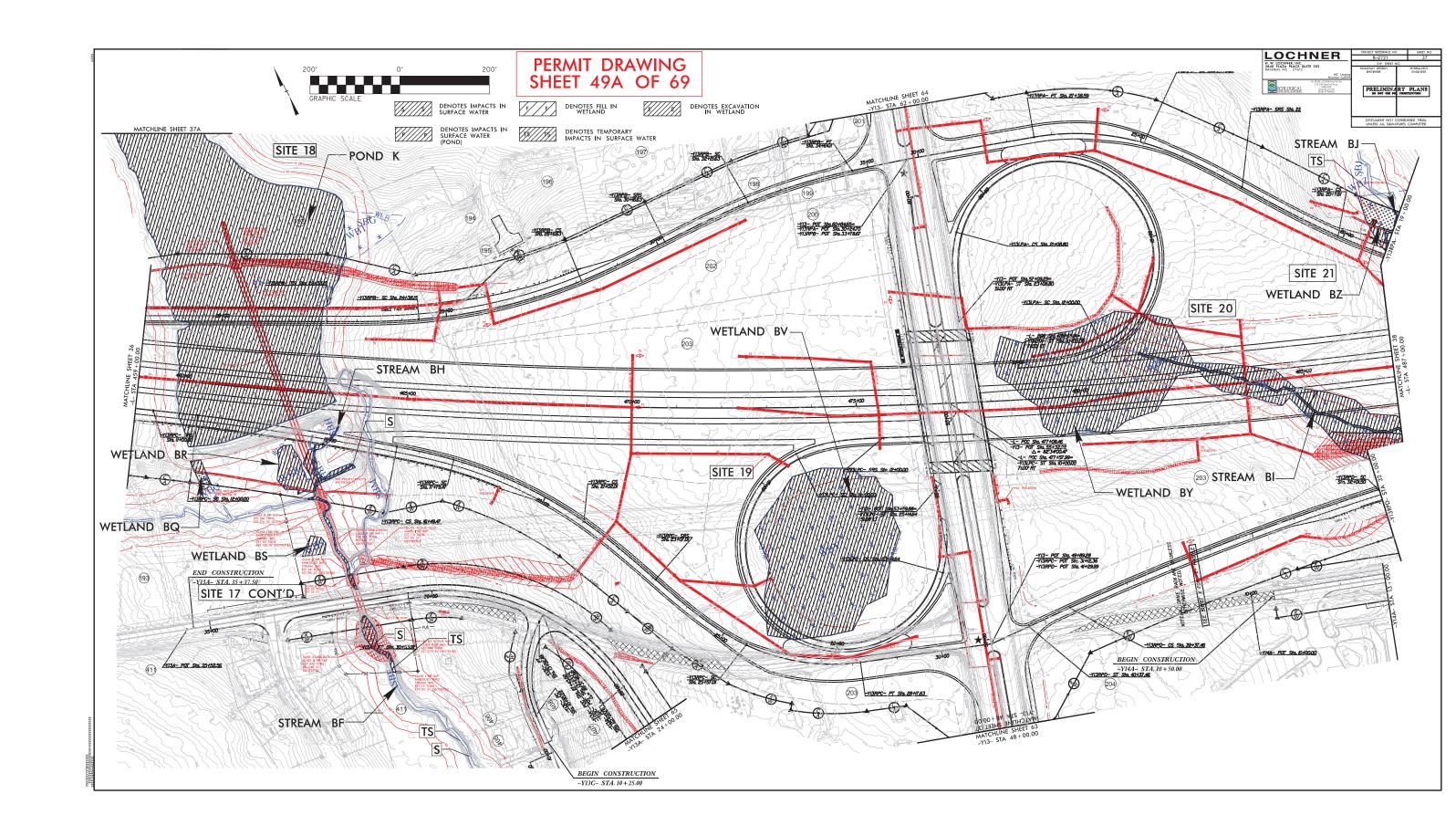


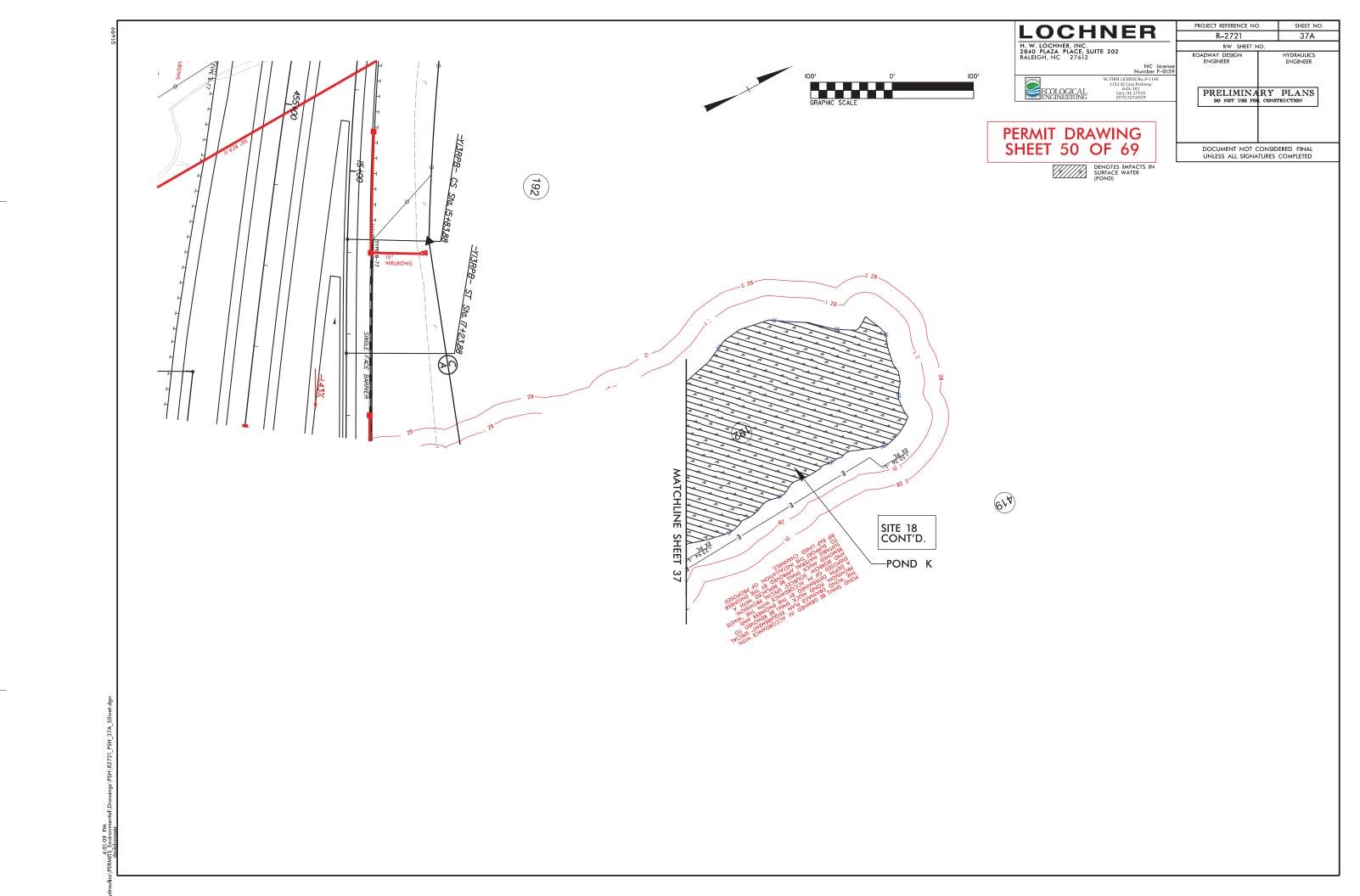


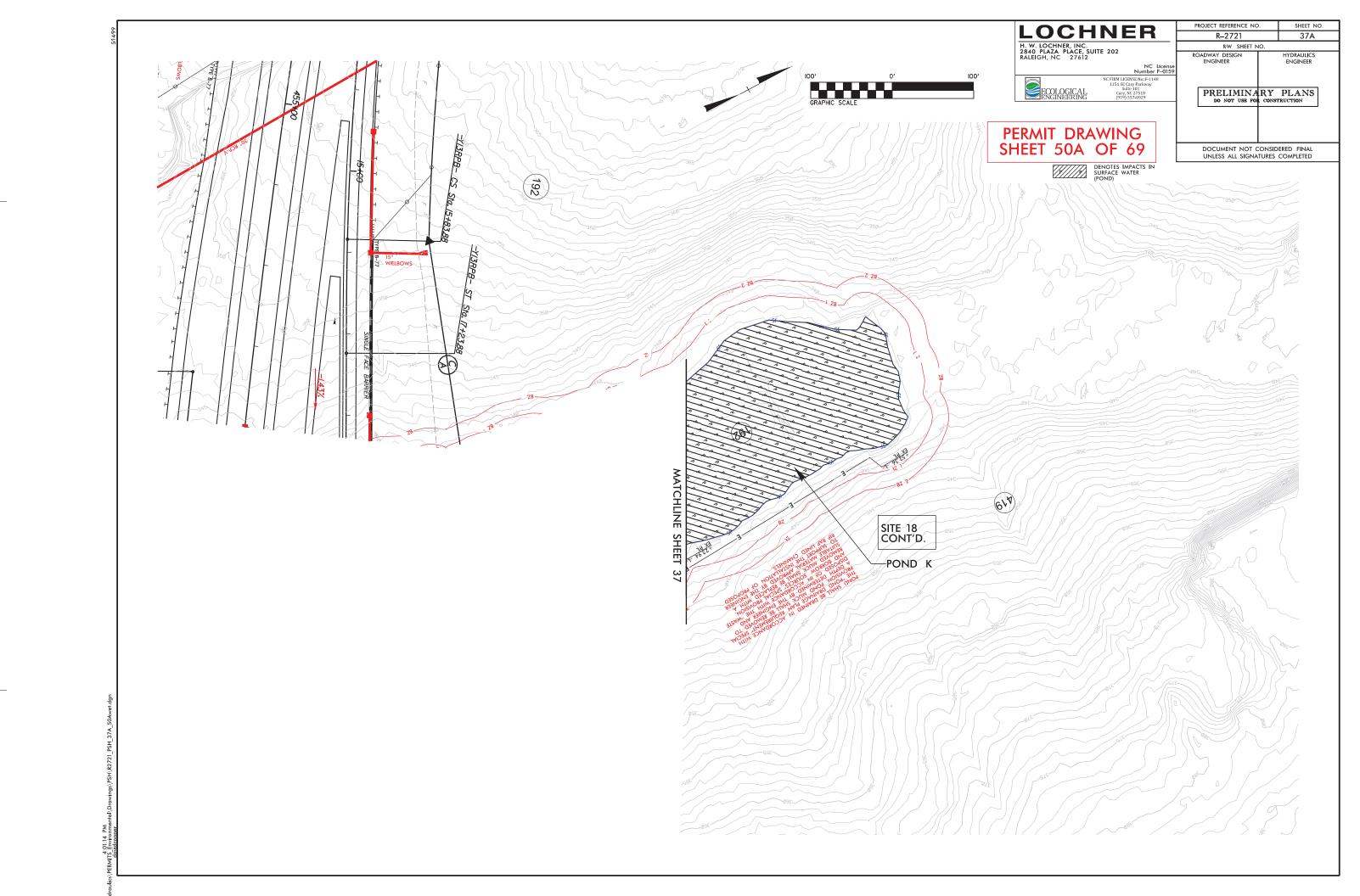


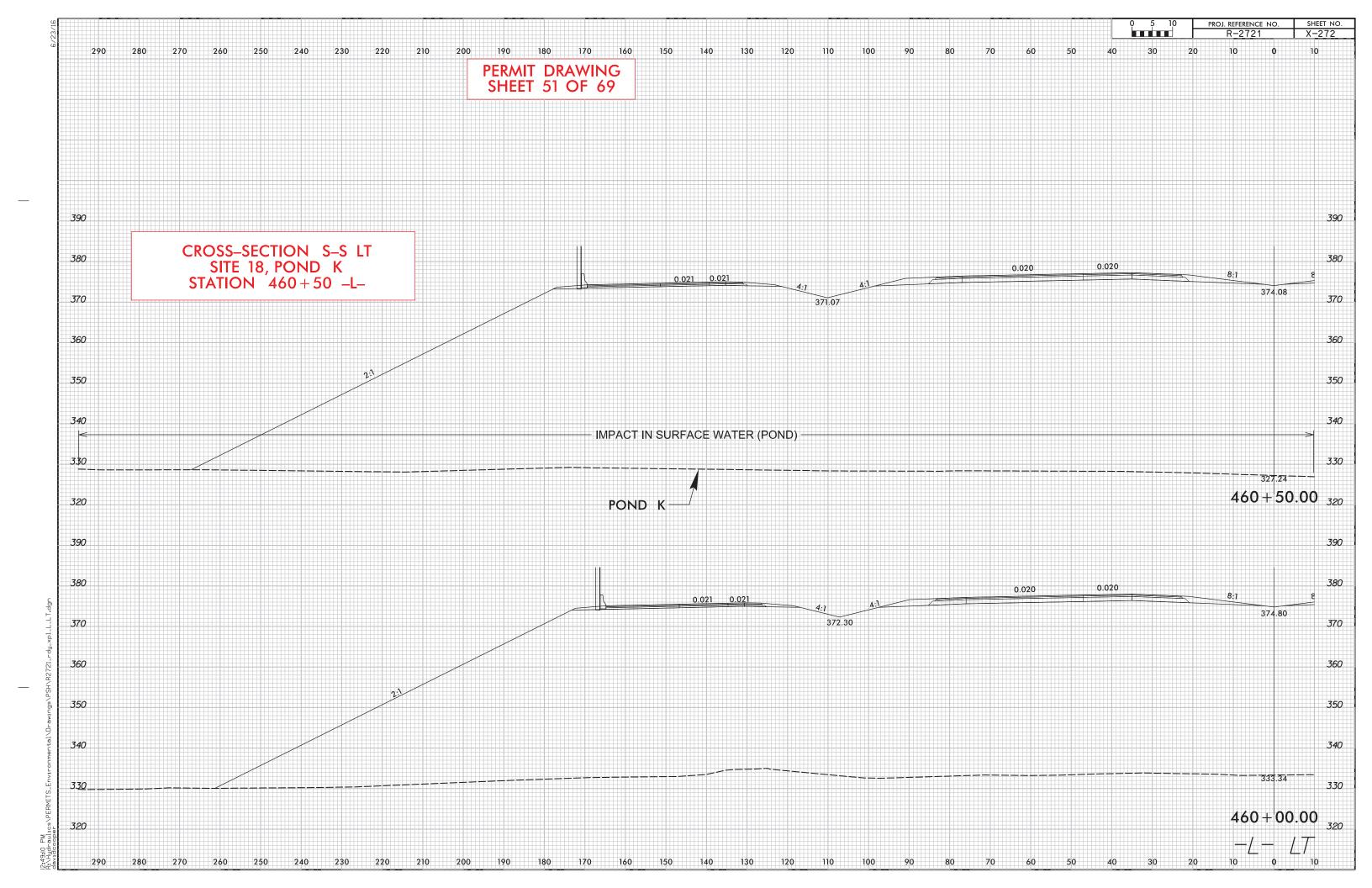


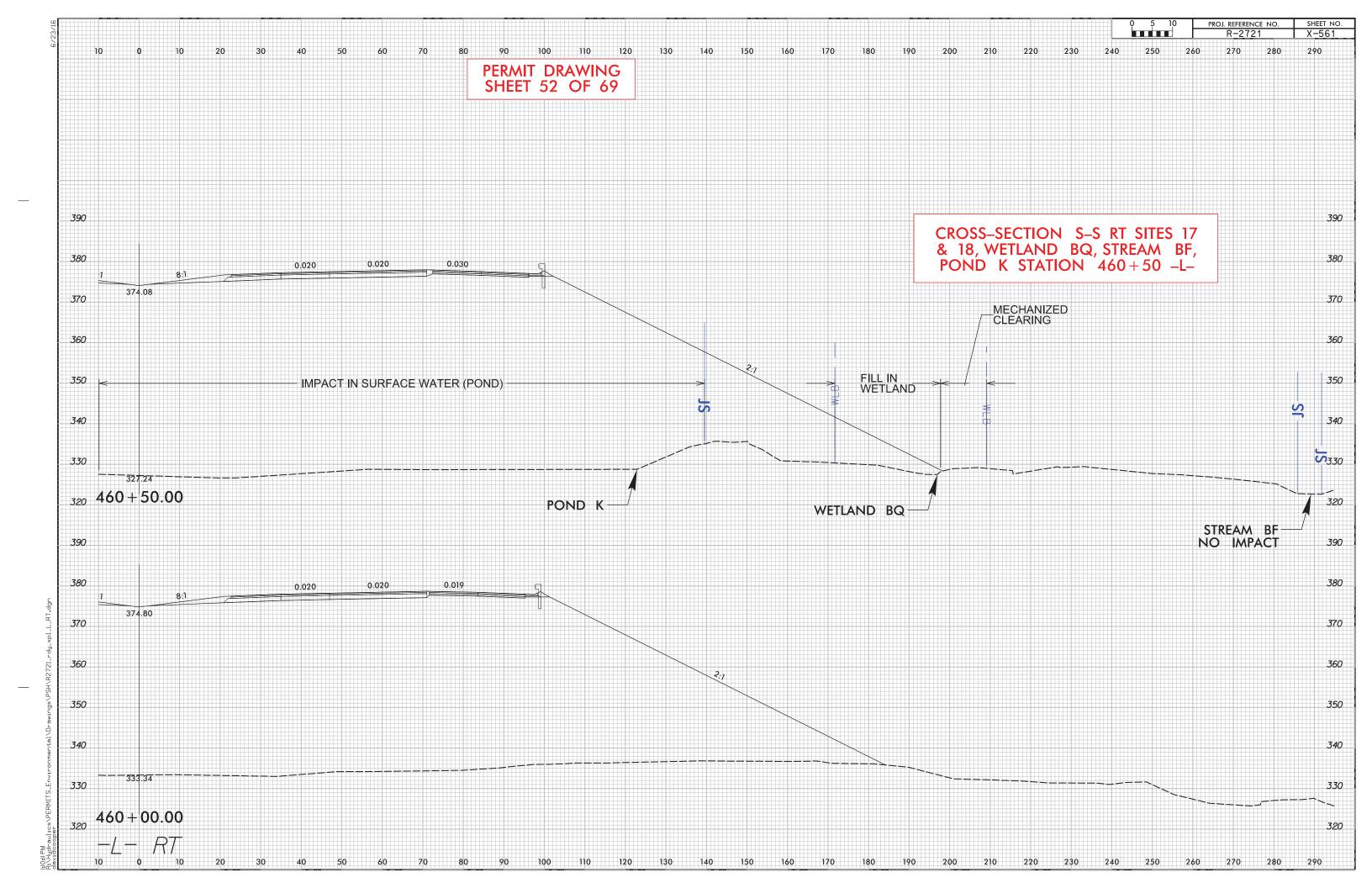


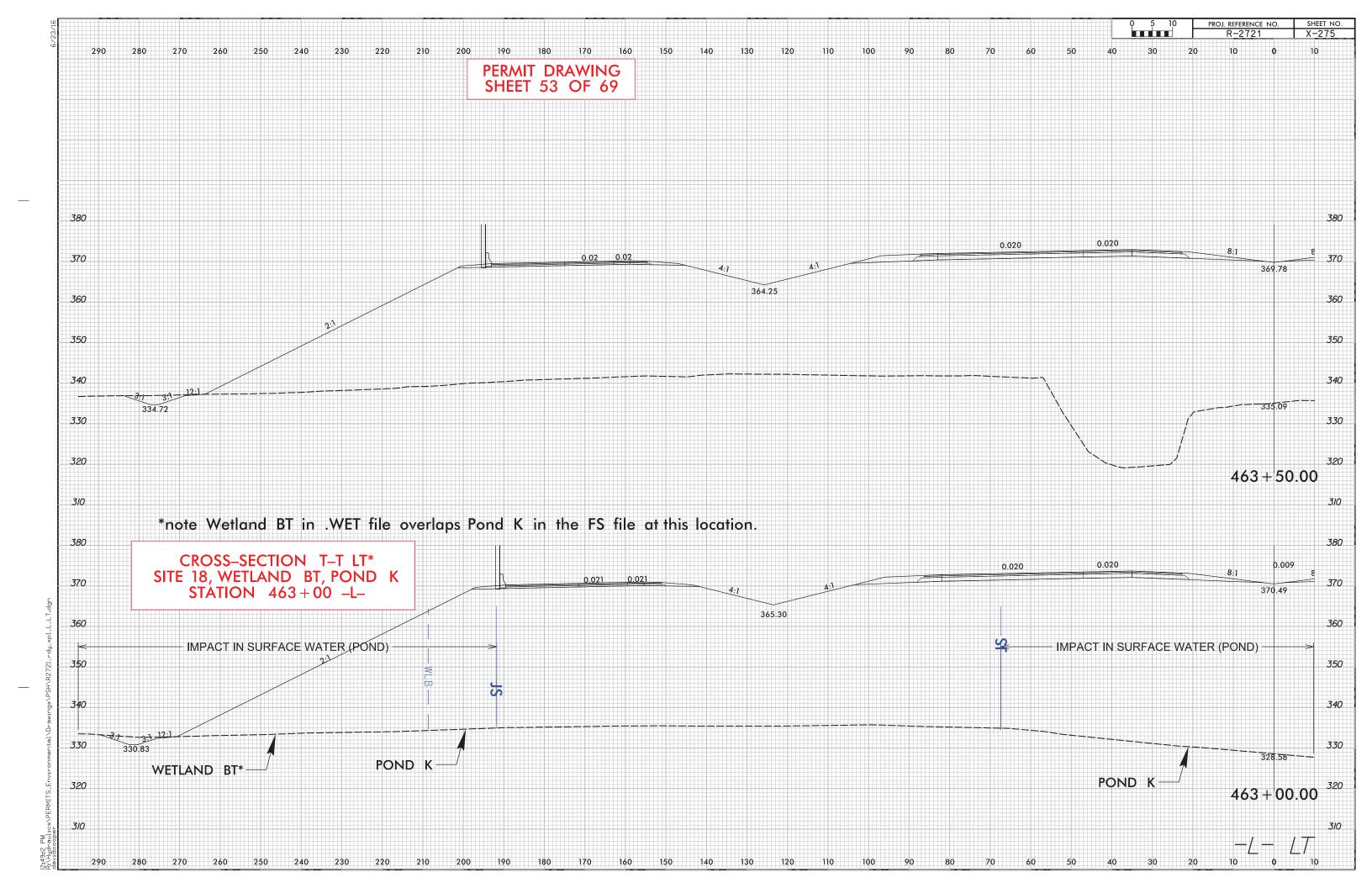


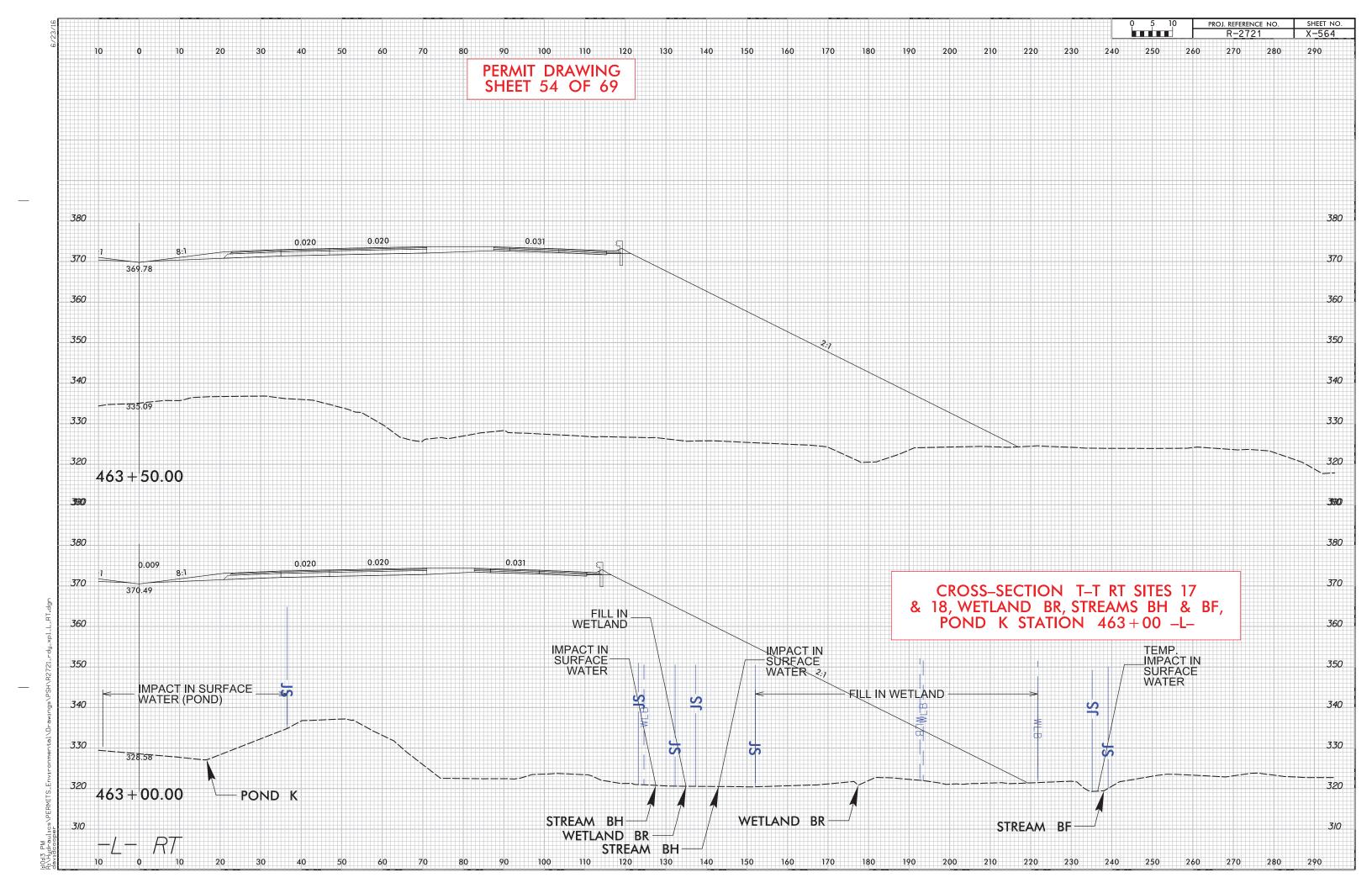


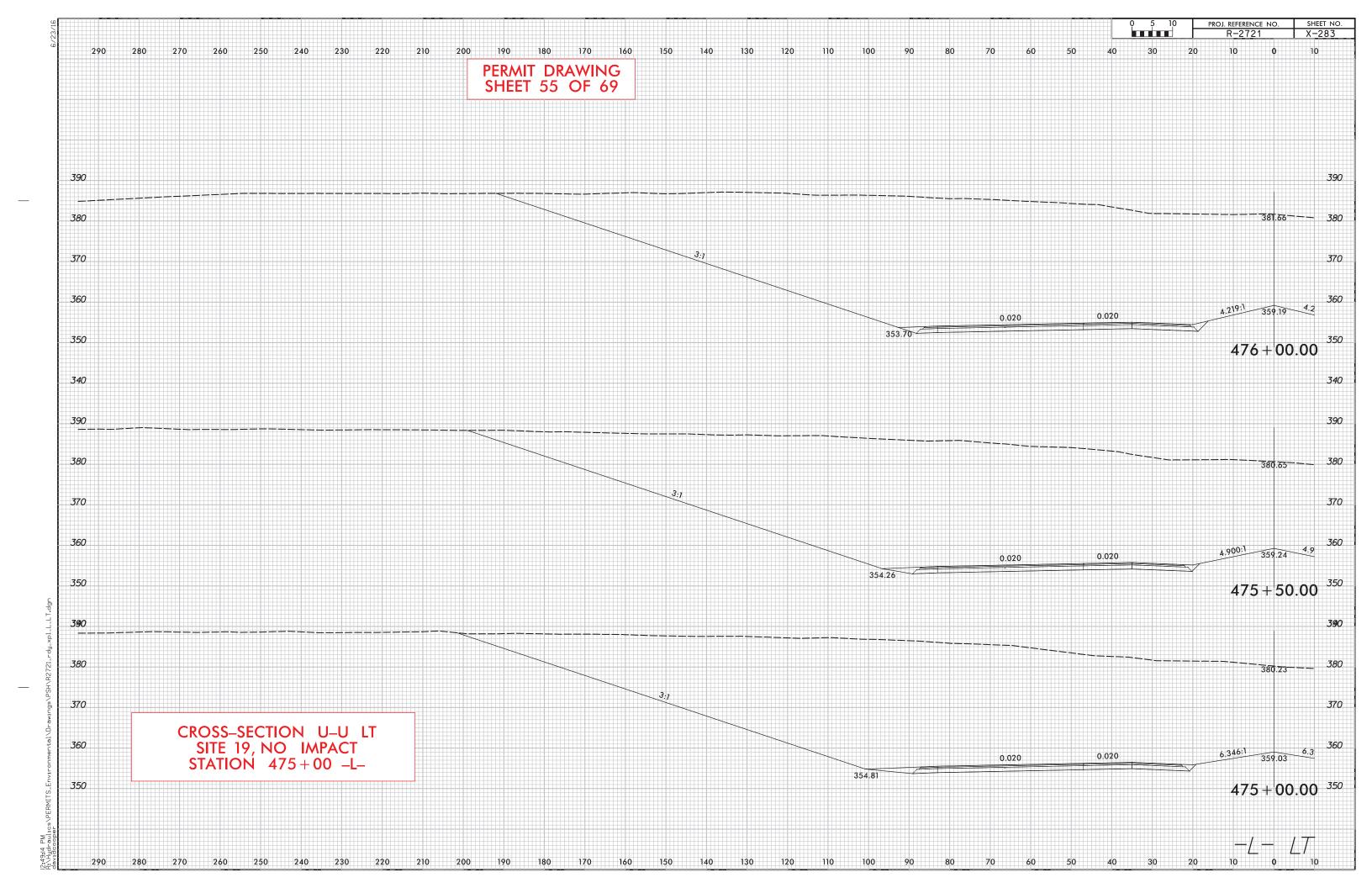


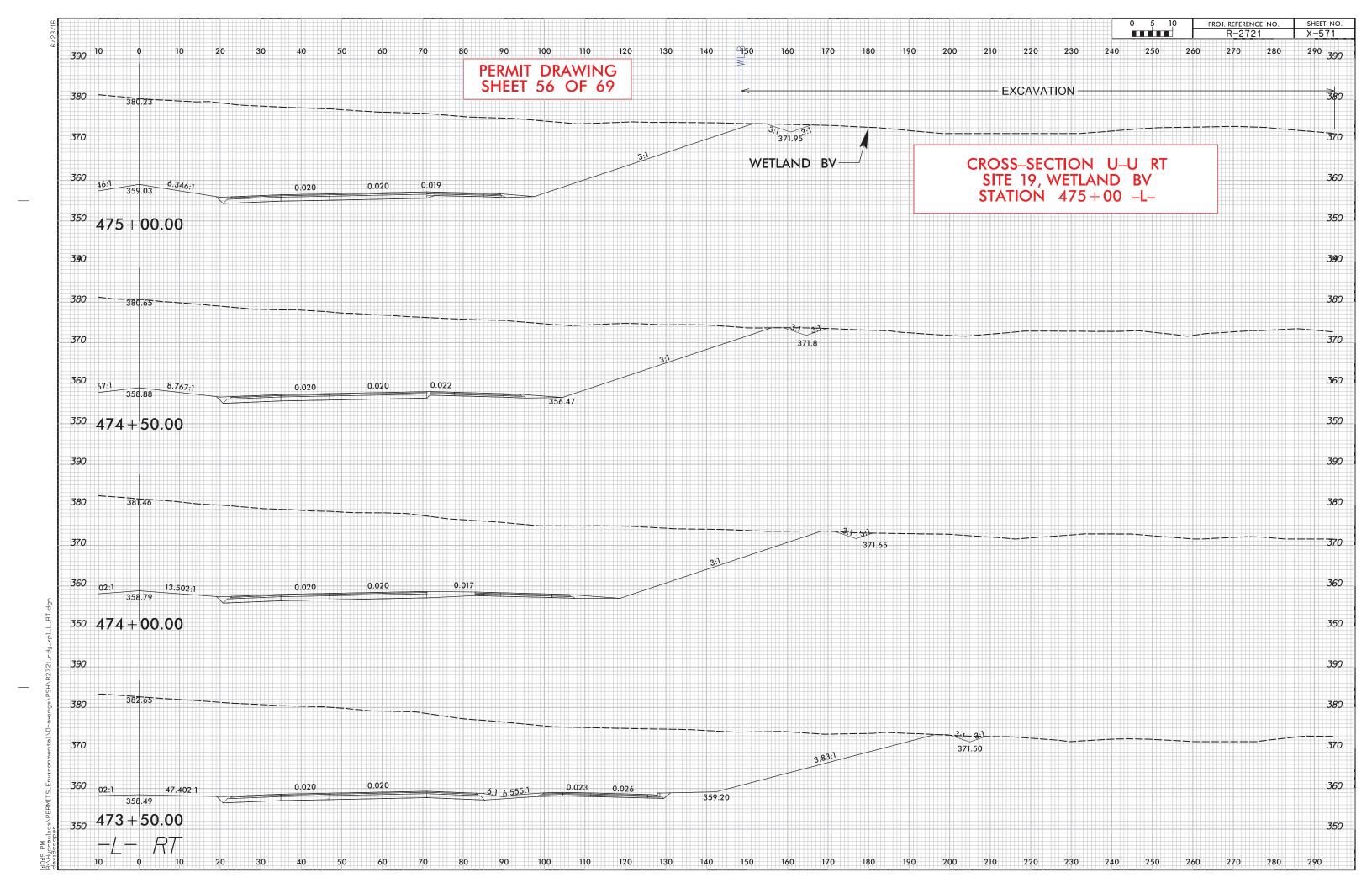


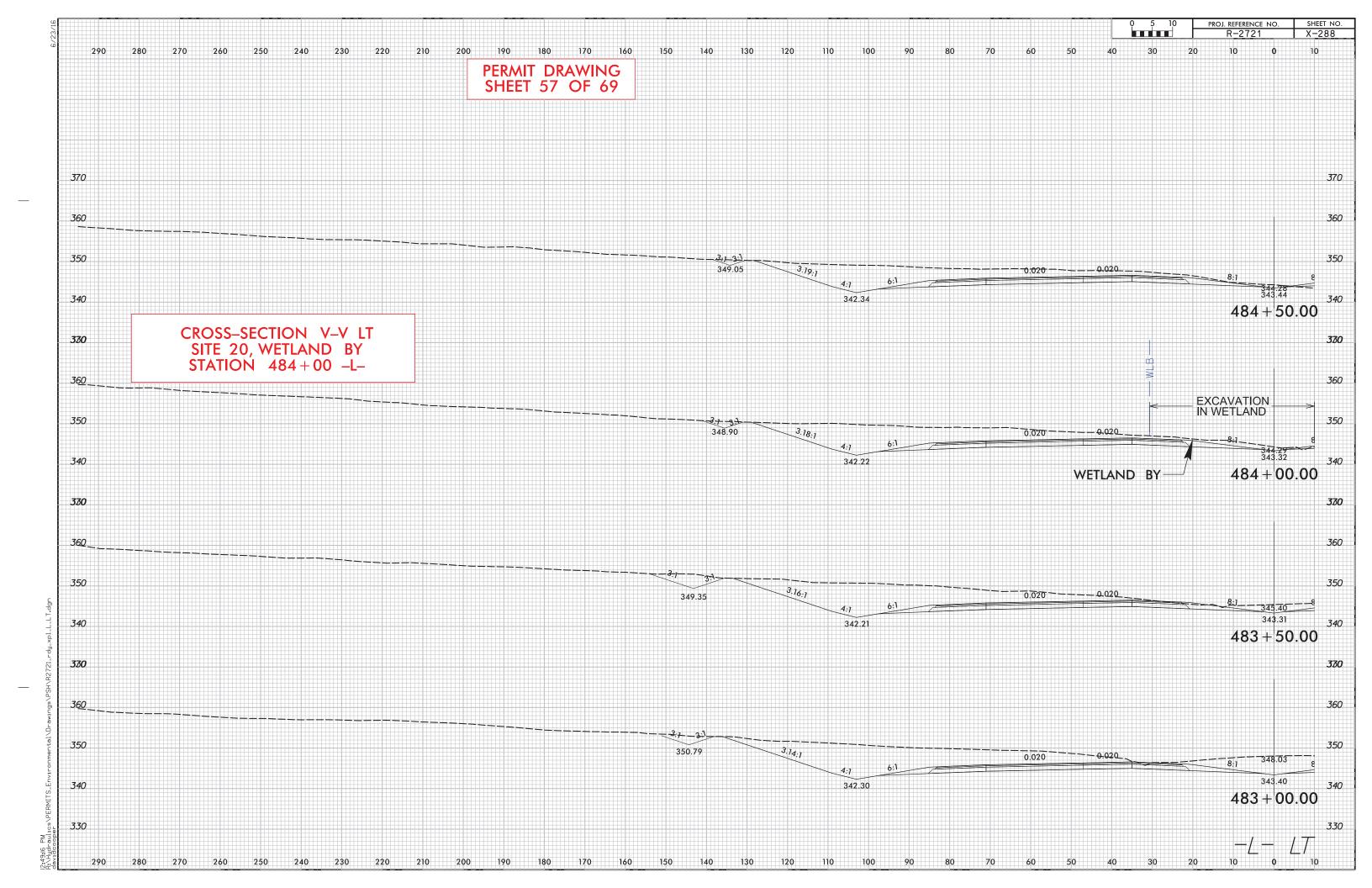


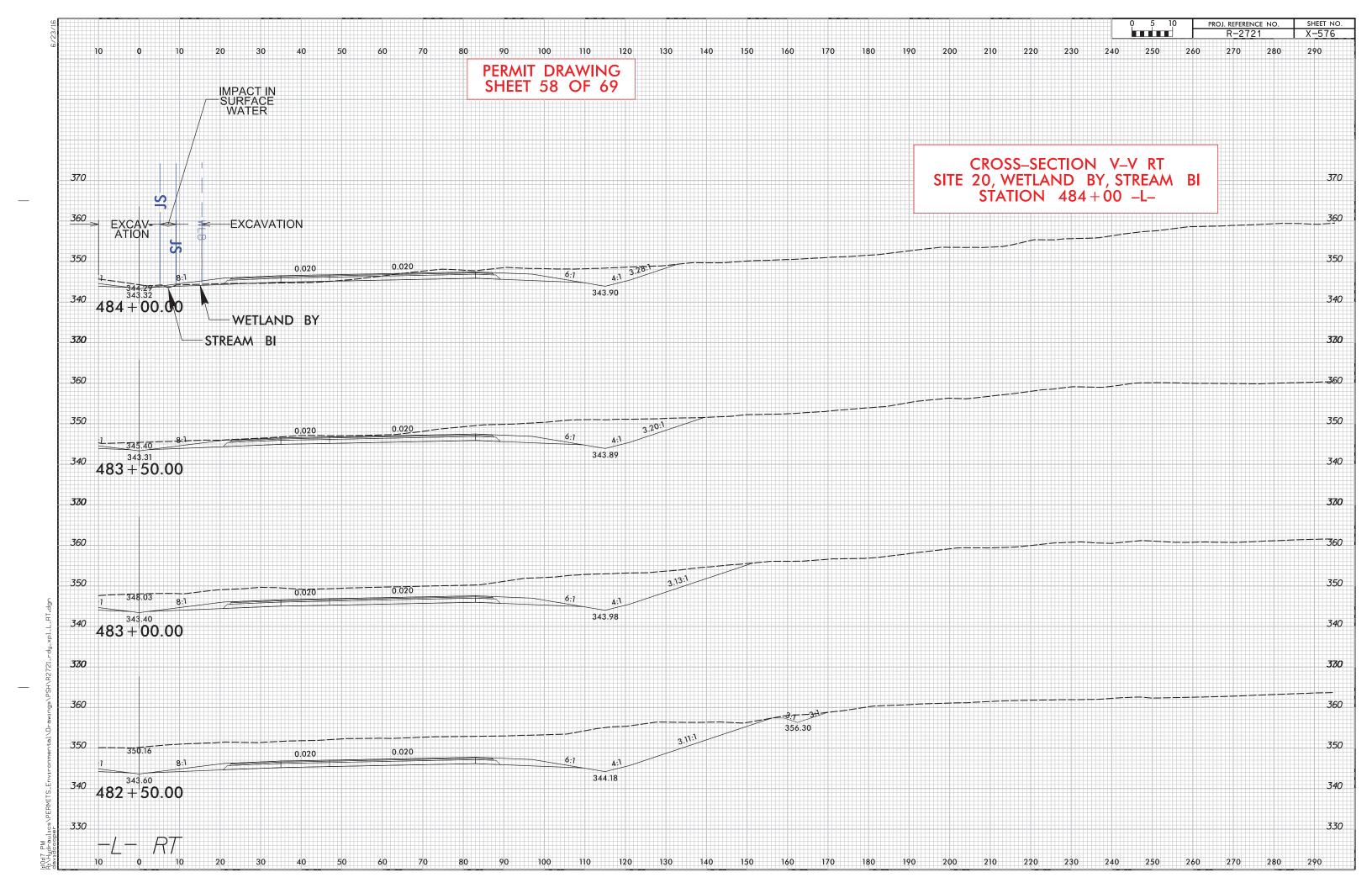


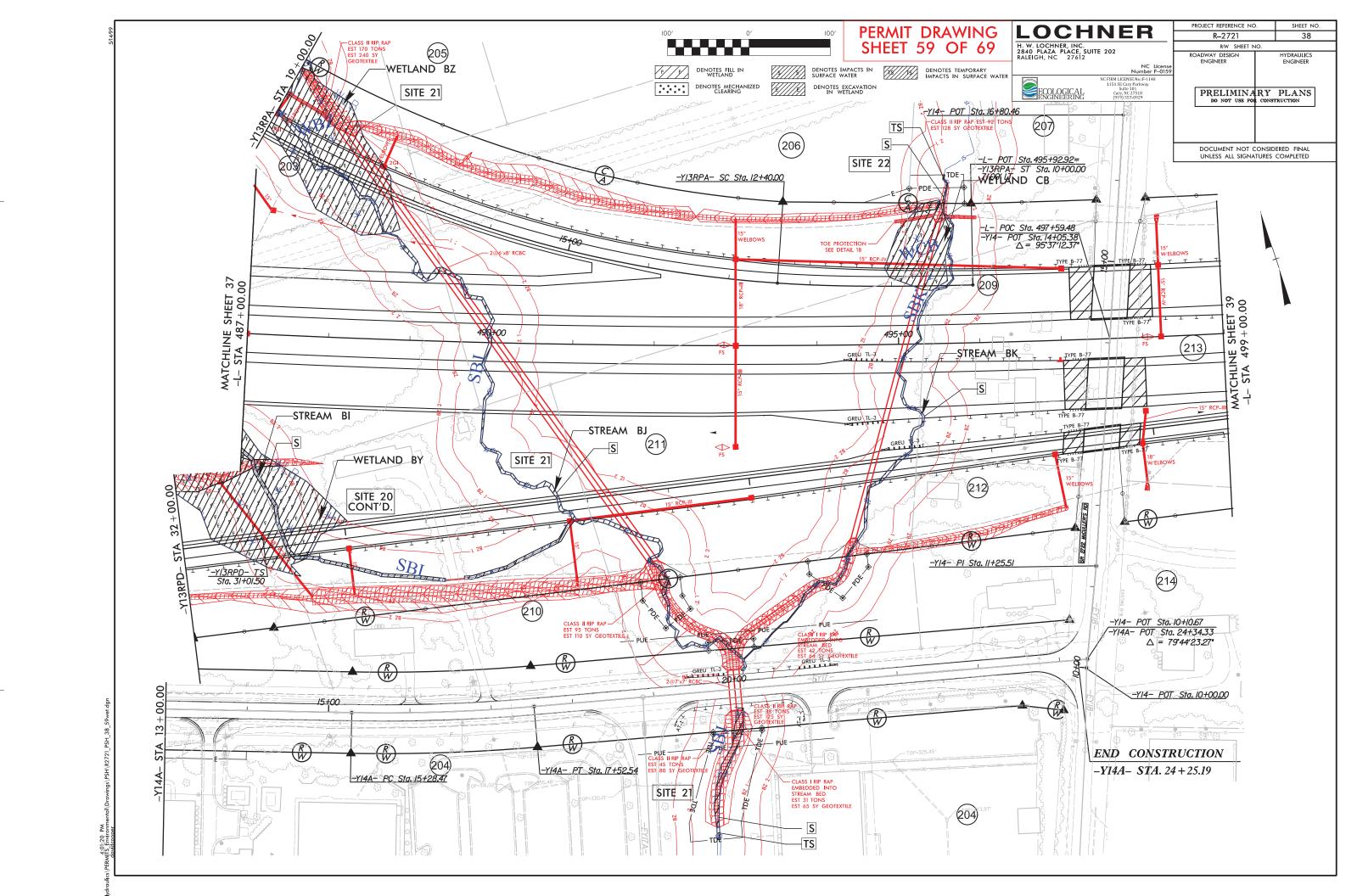


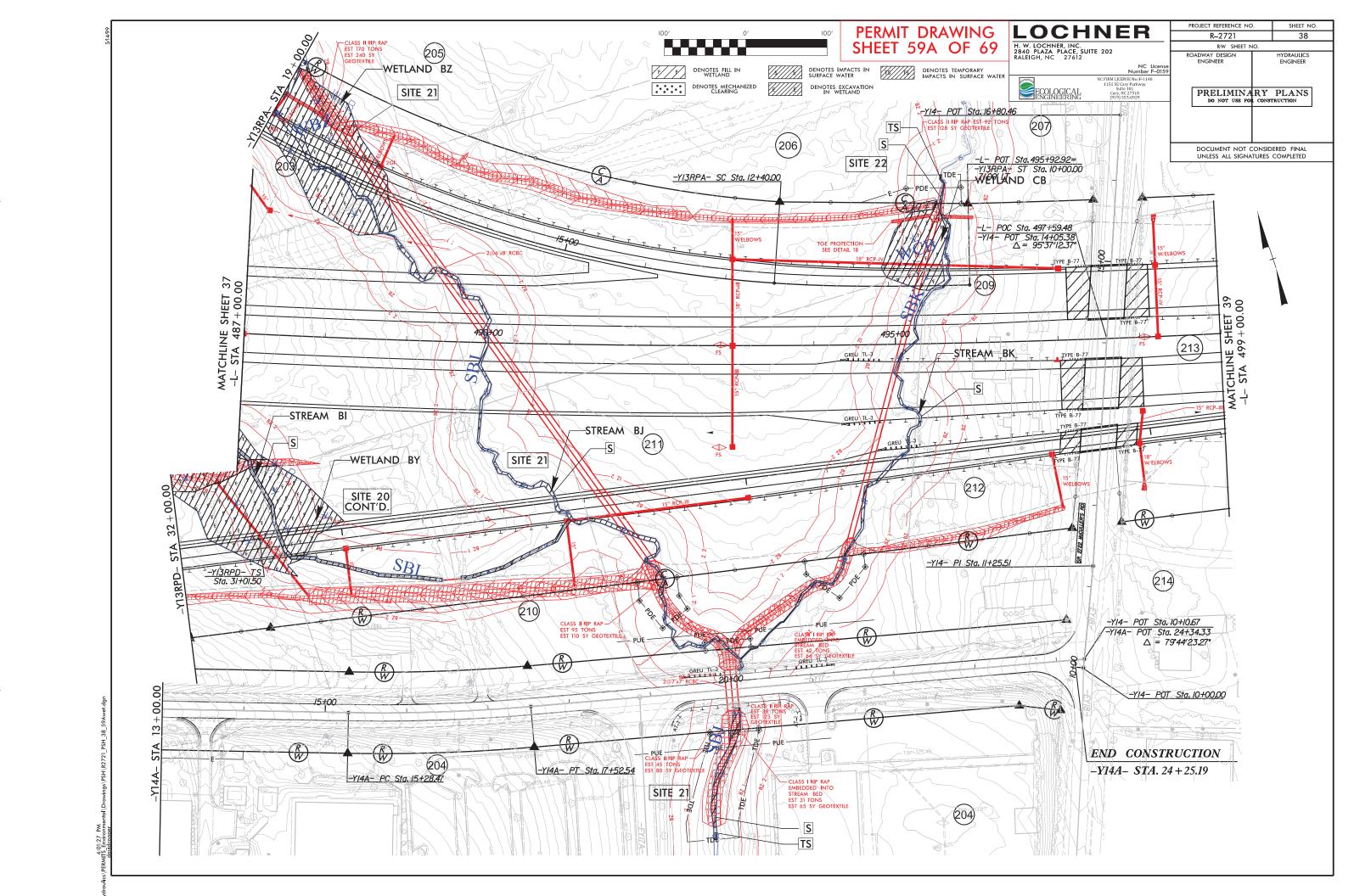


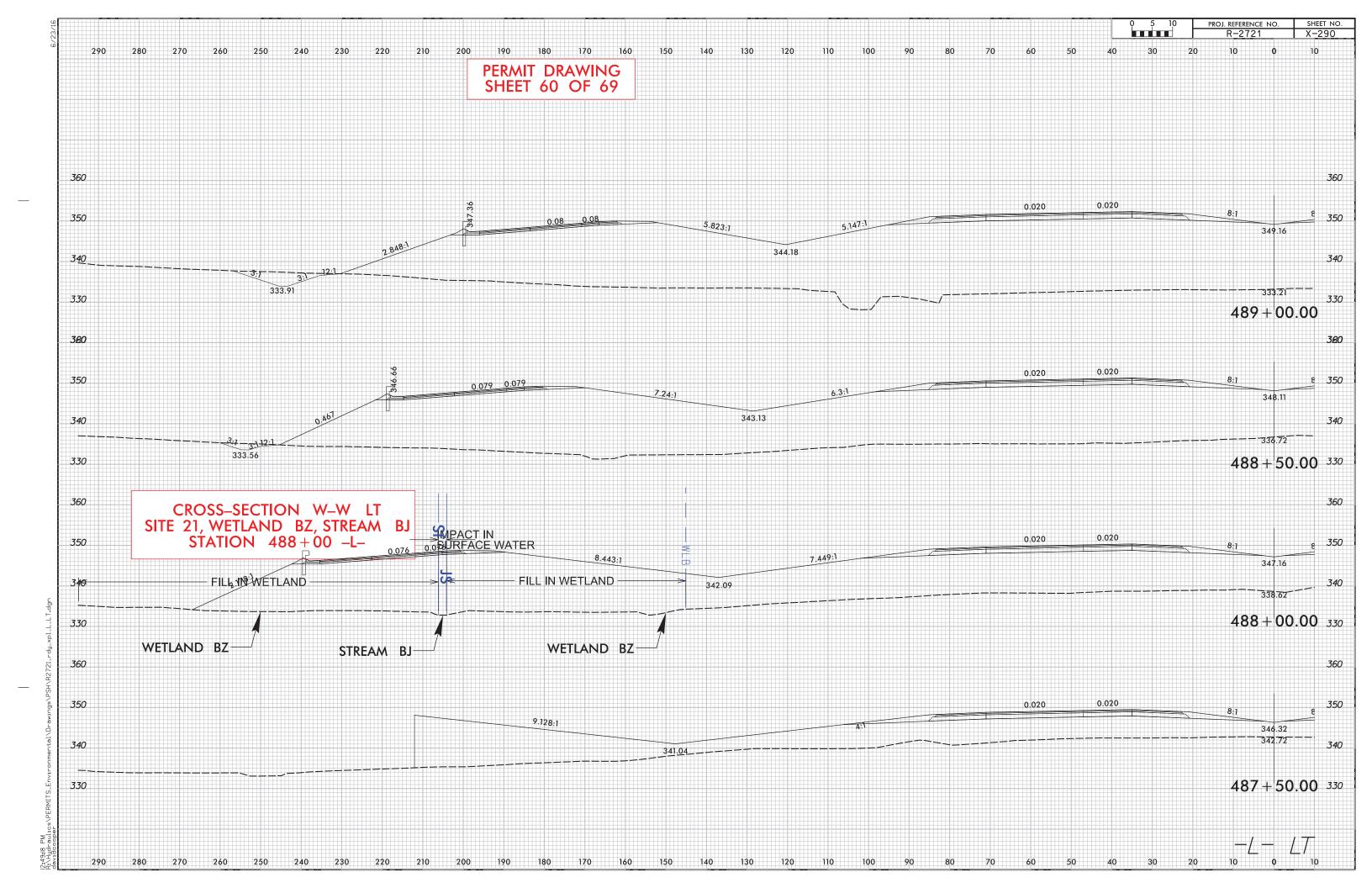


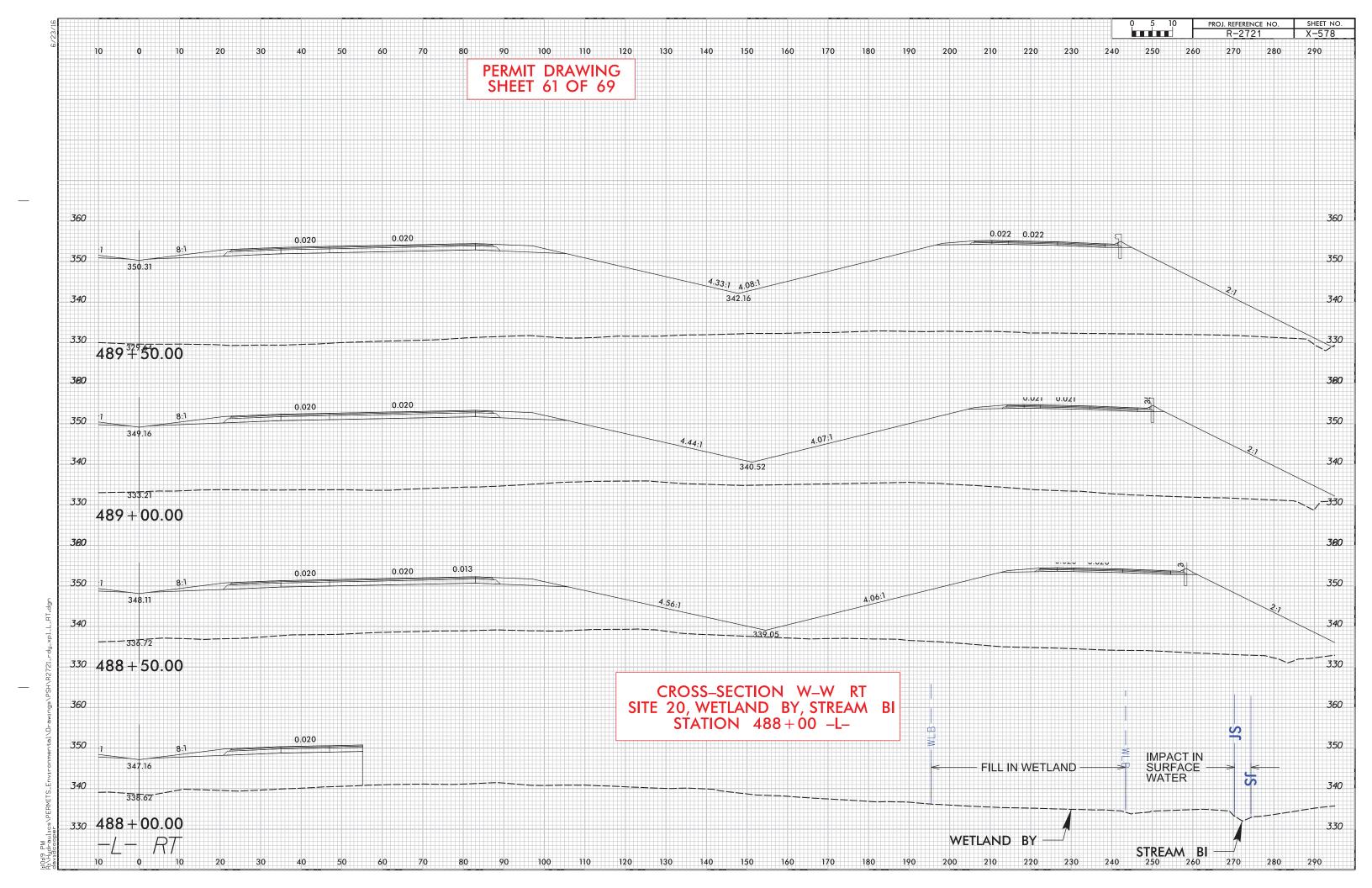


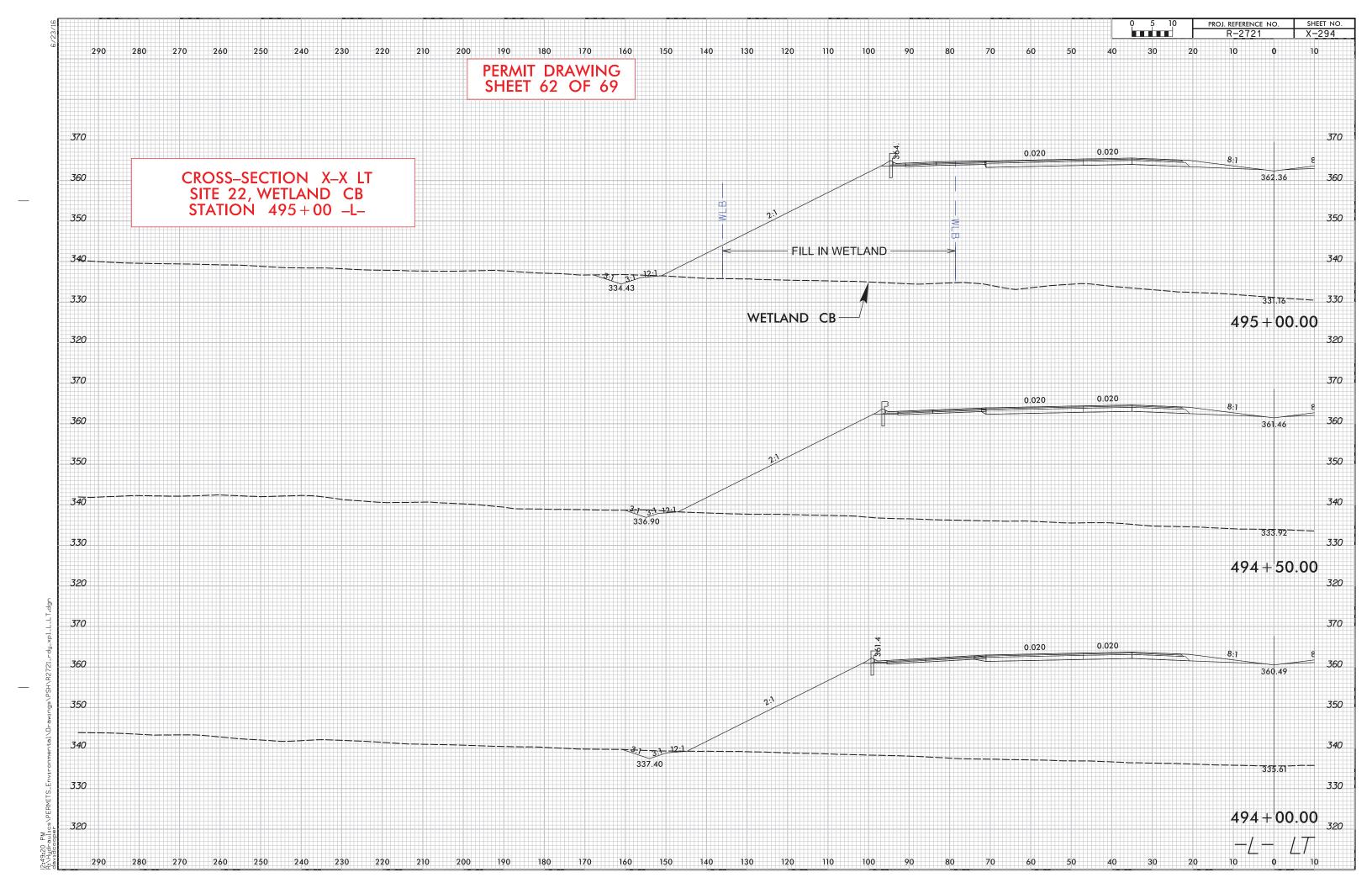


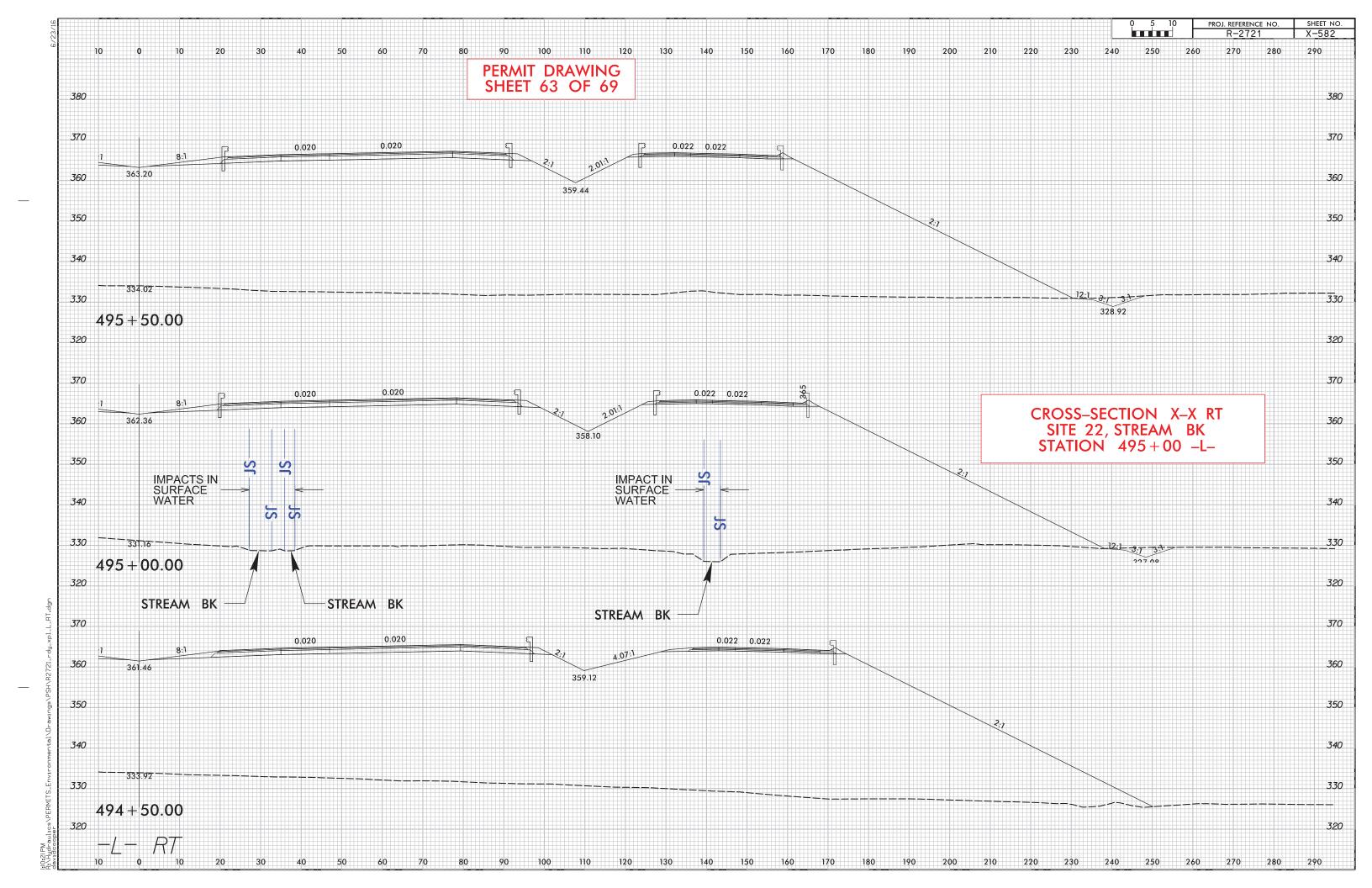


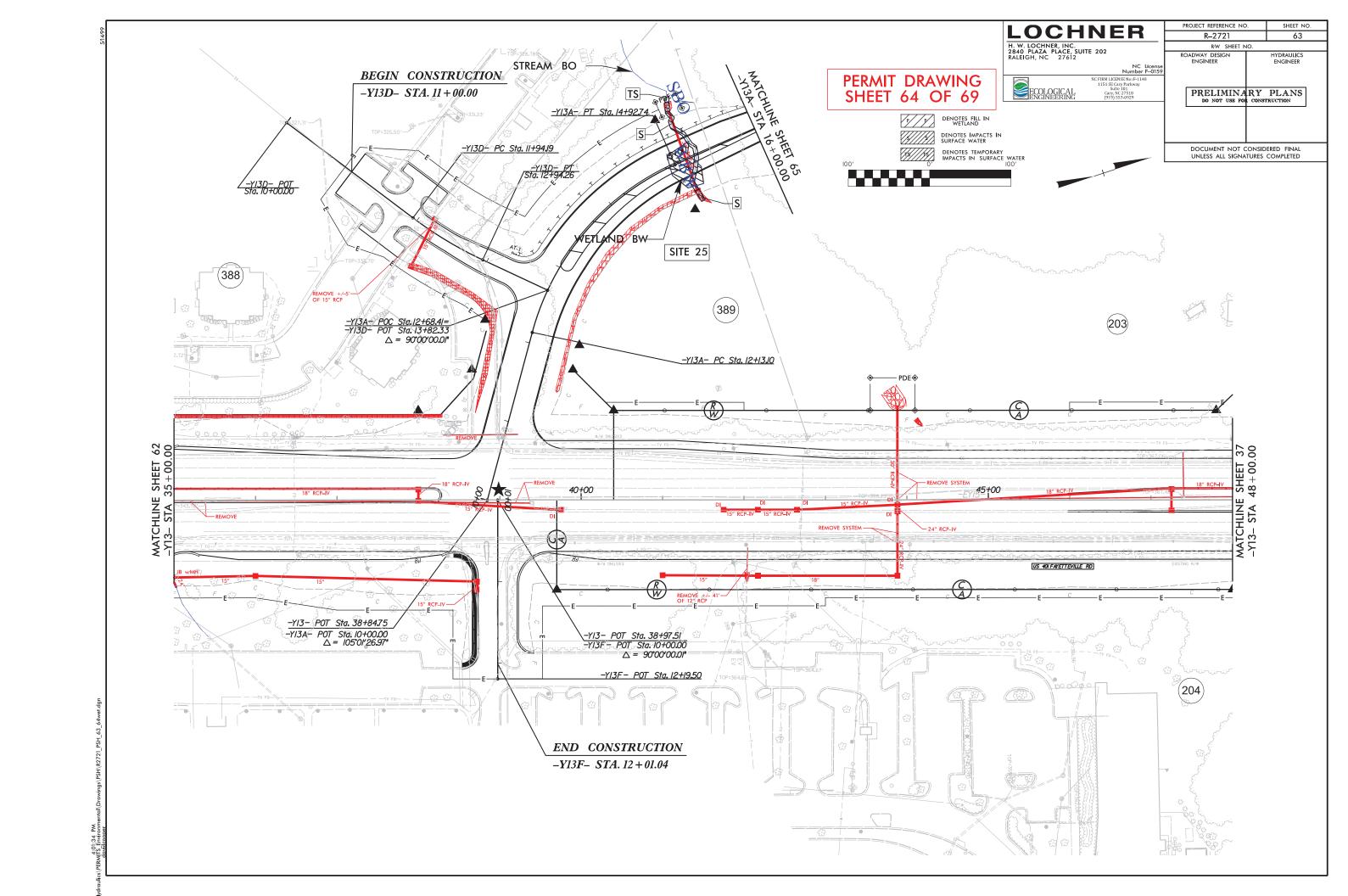


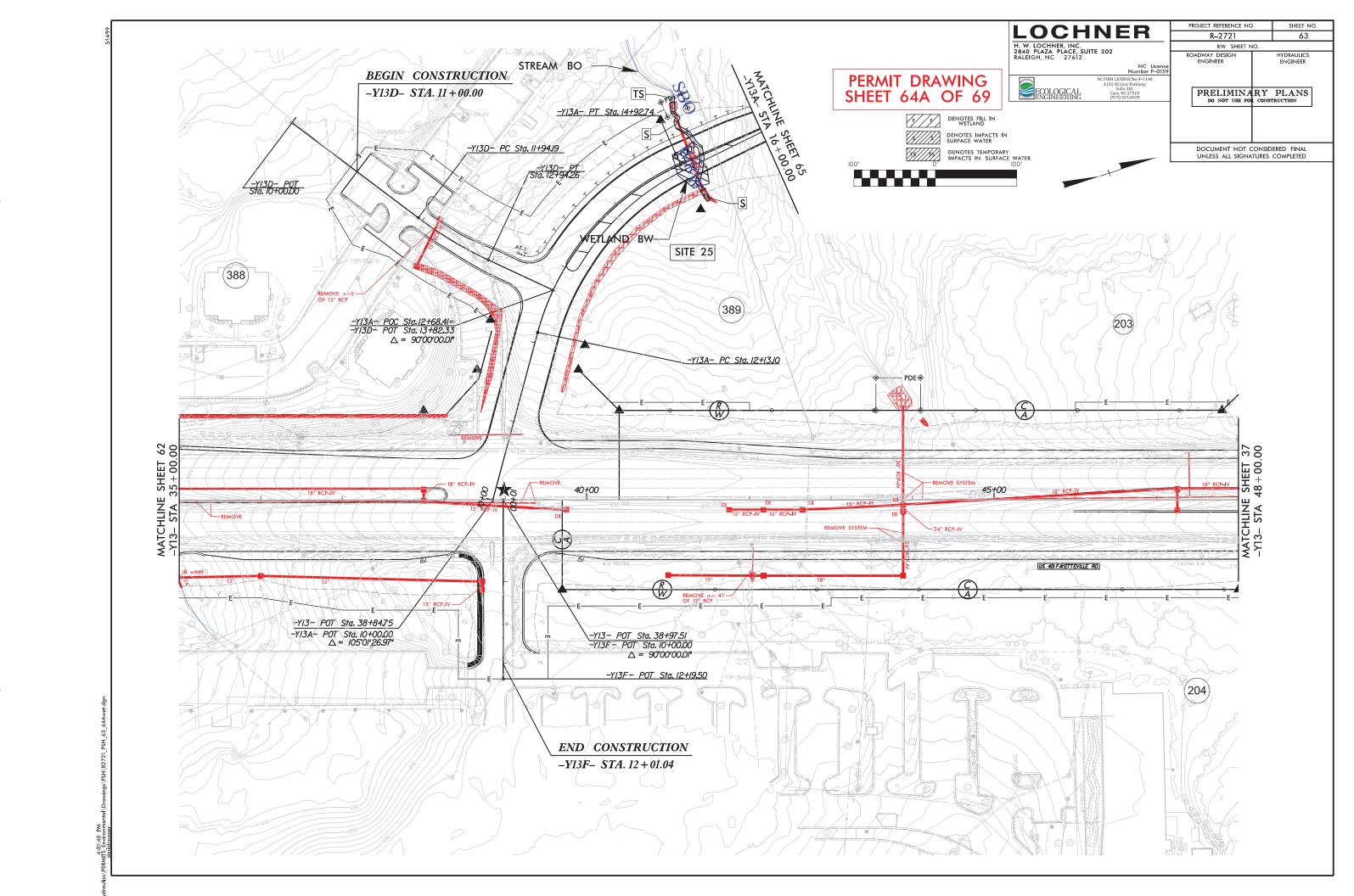


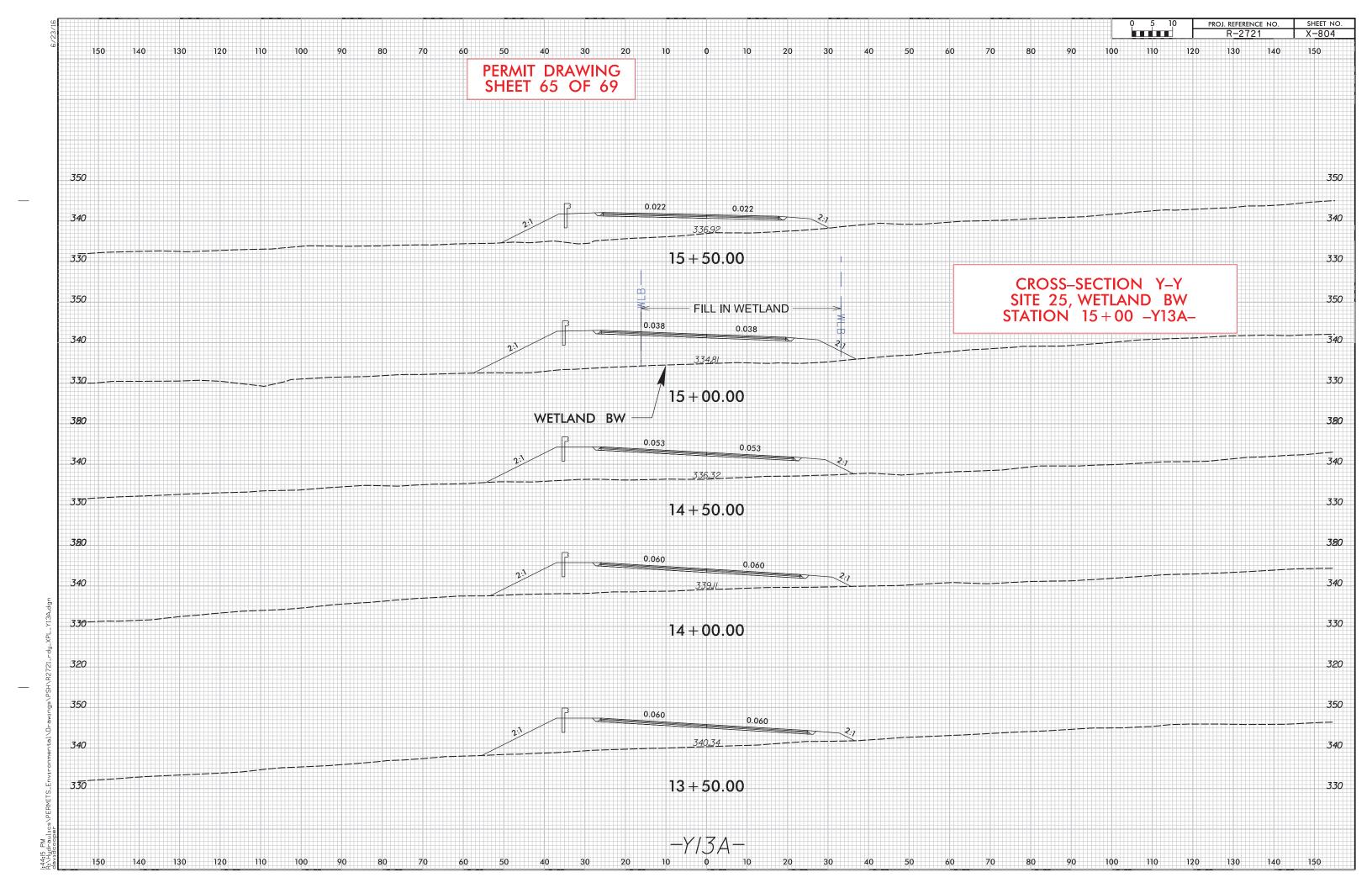


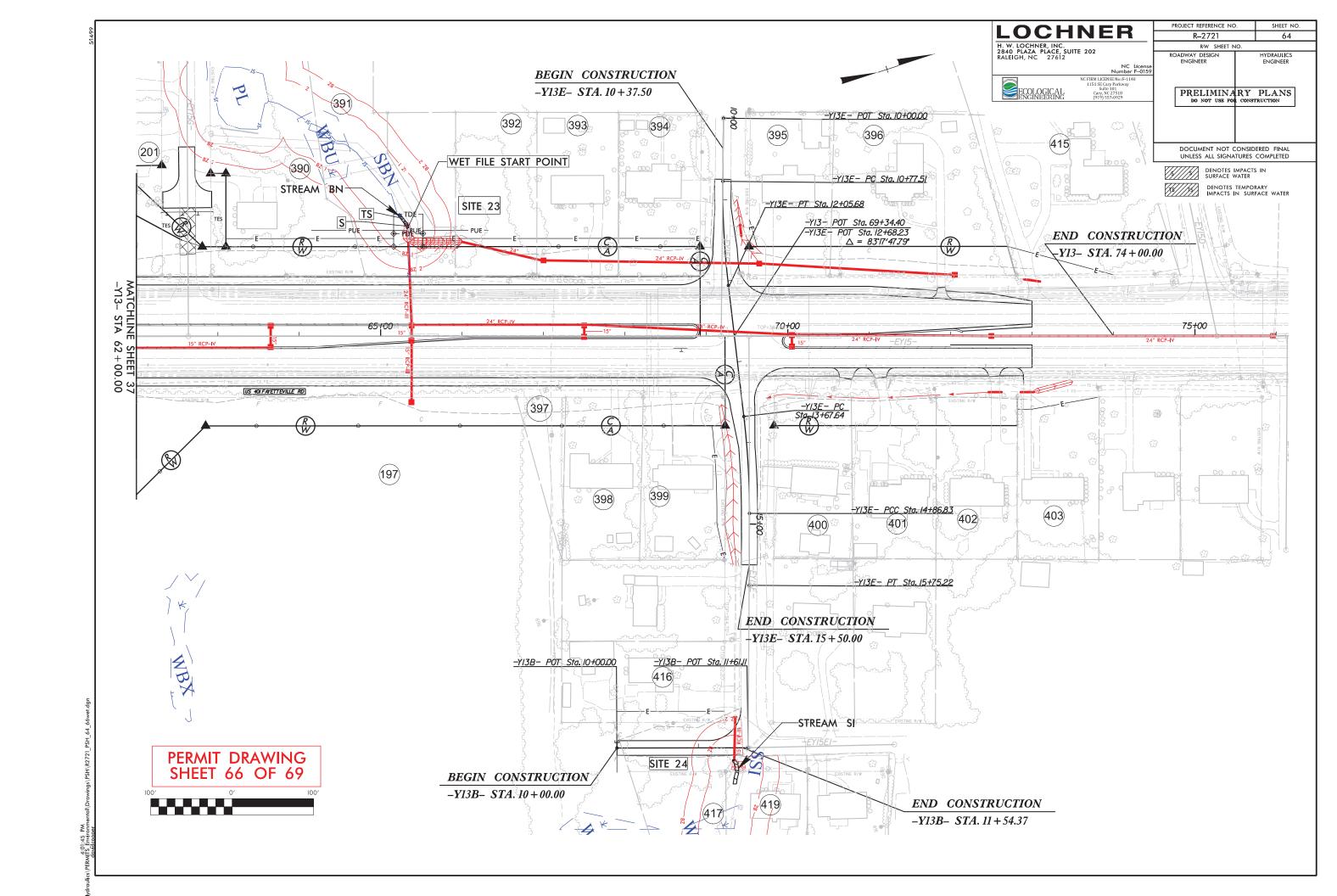


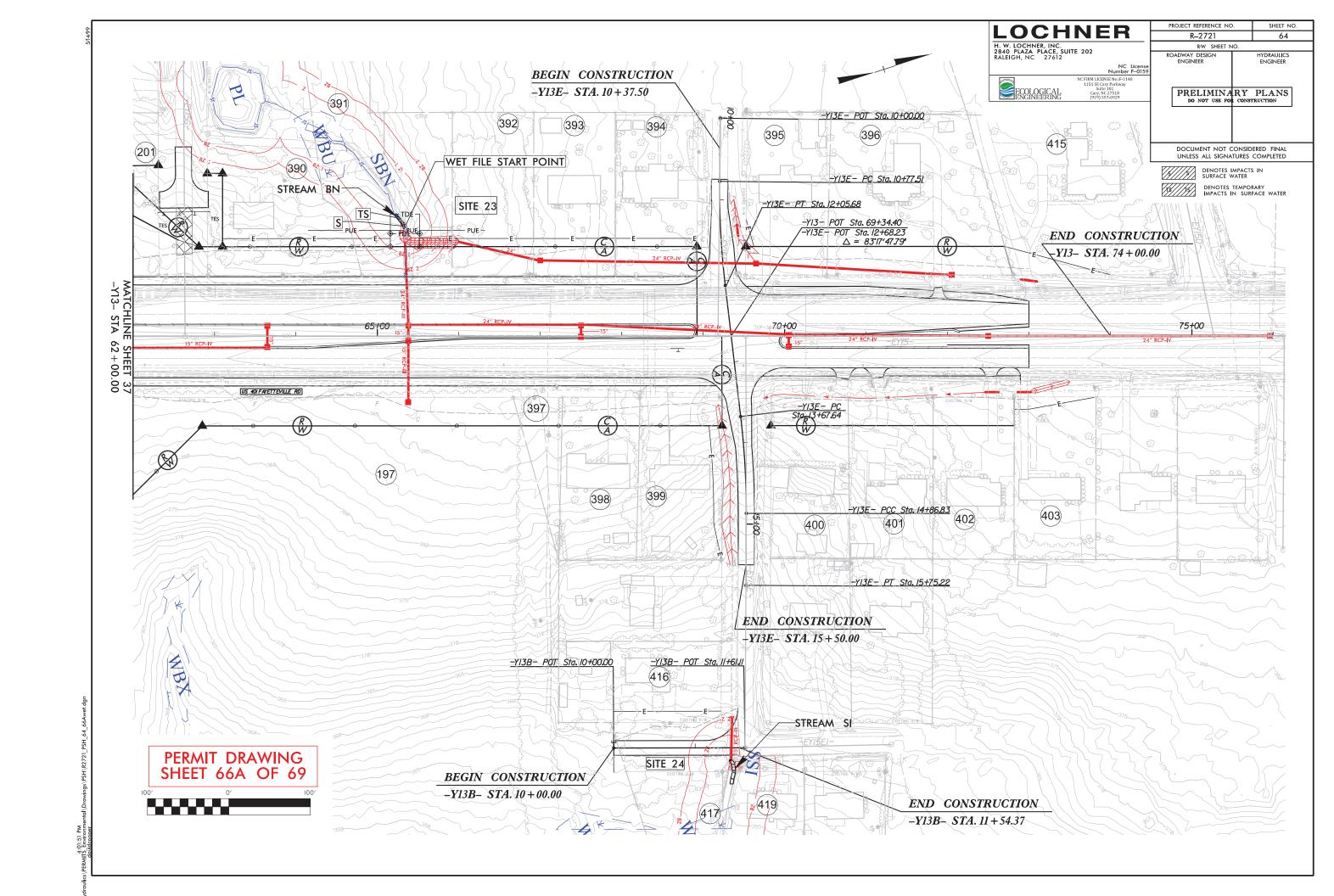


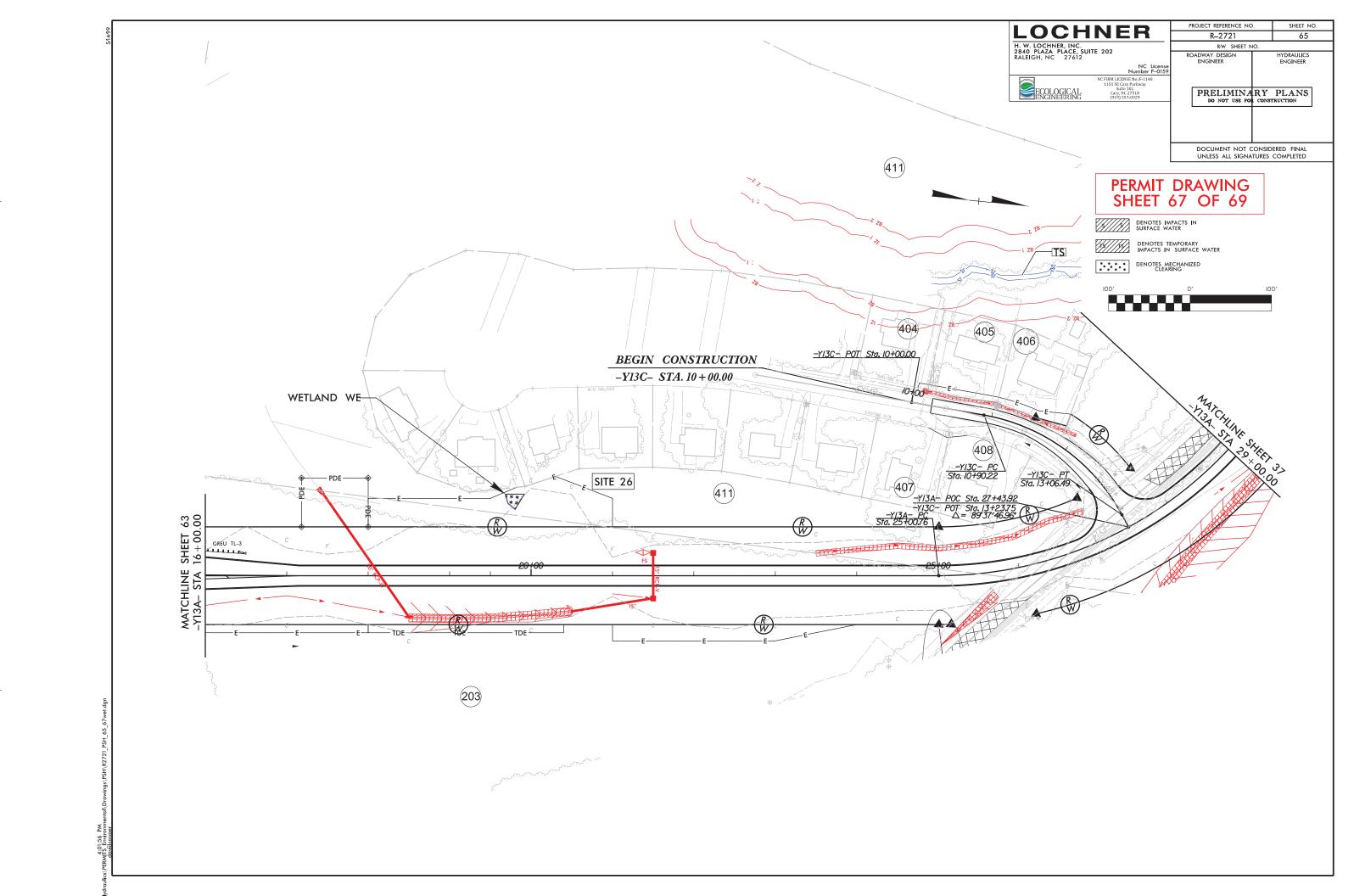


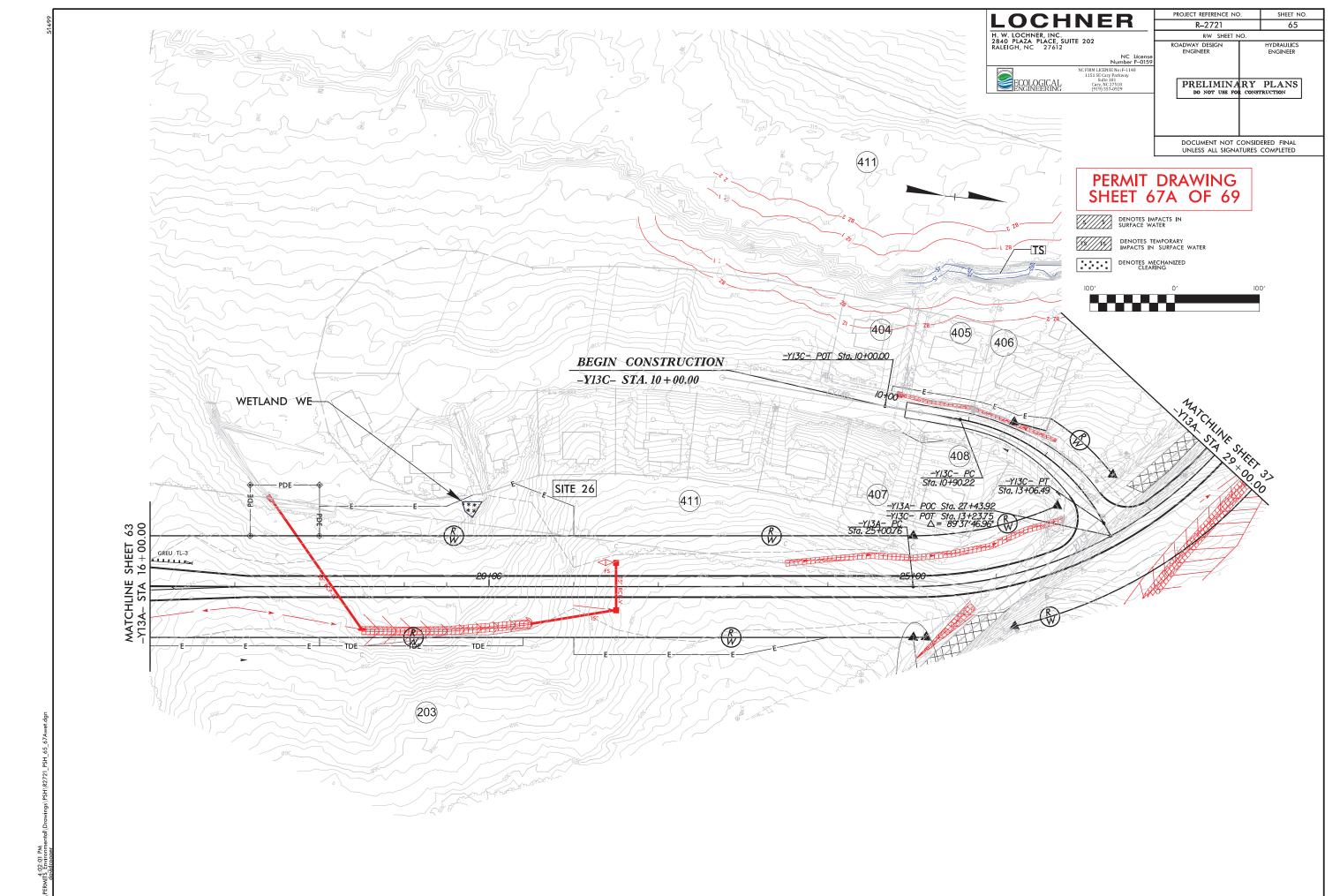












				WE	TLAND IMPA	CTS			SU	RFACE WA	ATER IMPACT	S	
							Hand	Permanent	Permanent		Existing	Existing	T
			Permanent	Temp.	Excavation	Mechanized	Clearing	SW	SW	Temp.	Channel	Channel	Natura
Site	Station	Structure	Fill In	Fill In	in	Clearing	in	impacts	impacts	SW	Impacts	Impacts	Stream
No.	(From/To)	Size / Type	Wetlands	Wetlands	Wetlands	in Wetlands	Wetlands	(Pond)	(Stream)	impacts	Permanent	Temp.	Design
			(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ft)	(ft)	(ft)
11	244+00-L-/248+00-L-	3@8'x10' RCBC	1.39		0.01	0.14			0.08	< 0.01	304	45	
		FILL							0.02		119		
		STABILIZATION							0.01		77		
2	279+00-L-/280+22-L-	FILL	0.87			0.12		0.95	0.03	< 0.01	398	11	
3	281+00 -L-/283+00-L-	2@7'X7' RCBC							0.04	< 0.01	316	46	
		FILL							< 0.01		11		
		STABILIZATION							0.01		84		
4	313+00-L-/317+00-L-	FILL	0.19		< 0.01	0.07			0.01	< 0.01	128	10	
5	322+00-L-/325+00-L-	1@6'X8' RCBC	1.12			0.18			0.05	< 0.01	460	32	
		FILL							0.01		77		
6	330+00-L-/332+00-L-	1@6'X8' RCBC (1)	0.54		< 0.01	0.03			0.01	< 0.01	268	30	
		1@6'X8' RCBC (2)							0.02		273		
		FILL							0.03		412		
7	346+00-L-/349+00-L-, 21+00-Y8RPA-/25+00-Y8RPA-	BRIDGES	0.23	0.39		0.02							1
8	365+00-L-/366+50-L-	FILL	0.25	< 0.01		0.03			< 0.01		105		
9	366+50-L-/13+50 -Y10A-	1@6'X8' RCBC	0.06		< 0.01	0.25			0.01	< 0.01	252	22	1
		66" RCP							< 0.01		105		1
		FILL							0.02		283		
		STABILIZATION							< 0.01		38		1
10++	380+00 -L-/383+00-L-	42" RCP						1.52					1
11	386+00-L-/391+00-L-	48" RCP						4.43	0.04	< 0.01	404	60	1
		STABILIZATION							< 0.01		20		1
12	384+50-L-/387+00-L-	FILL	0.86		0.03	0.15			0.01	< 0.01	157	46	1
OTALS*	THIS SHEET:		5.48	0.40	0.06	0.99		6.90	0.42	0.03	4291	302	0

^{*}Rounded totals are sum of actual impacts. ++Site includes only isolated resources.

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
APRIL 2018
WAKE COUNTY
TIP R-2721B
STATE PROJ. # 6.401078
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				WEI	LAND IMPA	CIS			SU	RFACE W	VATER IMPACTS		
							Hand		Permanent		Existing	Existing	
			Permanent	Temp.	Excavation	Mechanized	Clearing	SW	SW	Temp.	Channel	Channel	Natura
Site	Station	Structure	Fill In	Fill In	in	Clearing	in	impacts	impacts	SW	Impacts	Impacts	Strea
No.	(From/To)	Size / Type	Wetlands	Wetlands		in Wetlands	Wetlands	` /	(Stream)	impacts	Permanent	Temp.	Desig
			(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ac)	(ft)	(ft)	(ft)
13++	408+00-L-/411+00-L-	FILL	0.24		0.03							 	
14	412+00-L-/416+00-L-	FILL	0.39	0.04	0.03	0.15			0.03	< 0.01	402	28	
15	414+50-L-/415+50-L-	1@7'X8' RCBC						2.30	< 0.01		142		
16	420+00-L-/425+00-L-	42" RCP	0.70		0.02	0.41			0.04	< 0.01	315	13	
		FILL							< 0.01		18	<u> </u>	
		STABILIZATION							< 0.01		46	<u> </u>	
17	437+00-L-/30+00-Y13A-	2@7'X8'RCBC	0.55	< 0.01		0.09			< 0.01	< 0.01	11	46	
		FILL							< 0.01		170	<u> </u>	
		STABILIZATION							0.07		368	1	
18	459+50-L-/463+50-L-	2@7'X8'RCBC	0.18					6.36	0.02		256	1	
		STABILIZATION							< 0.01		15	<u> </u>	
19++	15+00-Y13LPC-	EXCAVATION			2.15							1	
20	478+00-L-/488+00-L-	FILL	0.62		2.34				0.10		1135	1	
21	490+00-L-	2@6'X8'RCBC	0.41			0.09			0.08	< 0.01	977	34	
		FILL							0.01		181	1	
		STABILIZATION							0.03		204	1	
22	495+00-L-	54" RCP	0.14		< 0.01				0.03	< 0.01	490	13	
		FILL							< 0.01		202	·	
		STABILIZATION							< 0.01		55	·	
23	65+30-Y13-	FILL							< 0.01	< 0.01	9	11	
24	10+00-Y13B-	15" RCP							< 0.01	< 0.01	1	17	
		FILL							< 0.01		13	·	
25	15+00-Y13A-	36" RCP	0.03						0.01	< 0.01	115	6	
		FILL							< 0.01		27	·	
26++	10+00-Y13A-	FILL				< 0.01							
OTALS* TH	IS SHEET:		3.26	0.05	4.57	0.74		8.66	0.47	0.01	5152	168	0

^{*}Rounded totals are sum of actual impacts. ++Site includes only isolated resources.

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
APRIL 2018
WAKE COUNTY
TIP R-2721B
STATE PROJ. # 6.401078
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Revised 2016 09 09

R-2721 Utility Environmental Impact Narrative

Date: June 21, 2018

Utility Owner: Town of Cary, N.C.

Contact: Hinde Engineering, Inc.

ATTN: R. B. Wilkins, PE

401 Harrison Oaks Blvd., Suite 145

Cary, NC 27513

rwilkins@hindeengineering.com

Utility: Gravity Sewer (various sizes)

General Utility Relocation:

This narrative applies to the relocation of two sanitary sewer outfall lines owned and maintained by the Town of Cary. Both lines are currently located inside utility easements owned by the Town of Cary which will be inside a portion of the proposed right-of-way and crossing the proposed project in a perpendicular configuration. Both lines conflict with proposed construction and the relocation of each is briefly described below.

Environmental Impacts:

• Site A1:

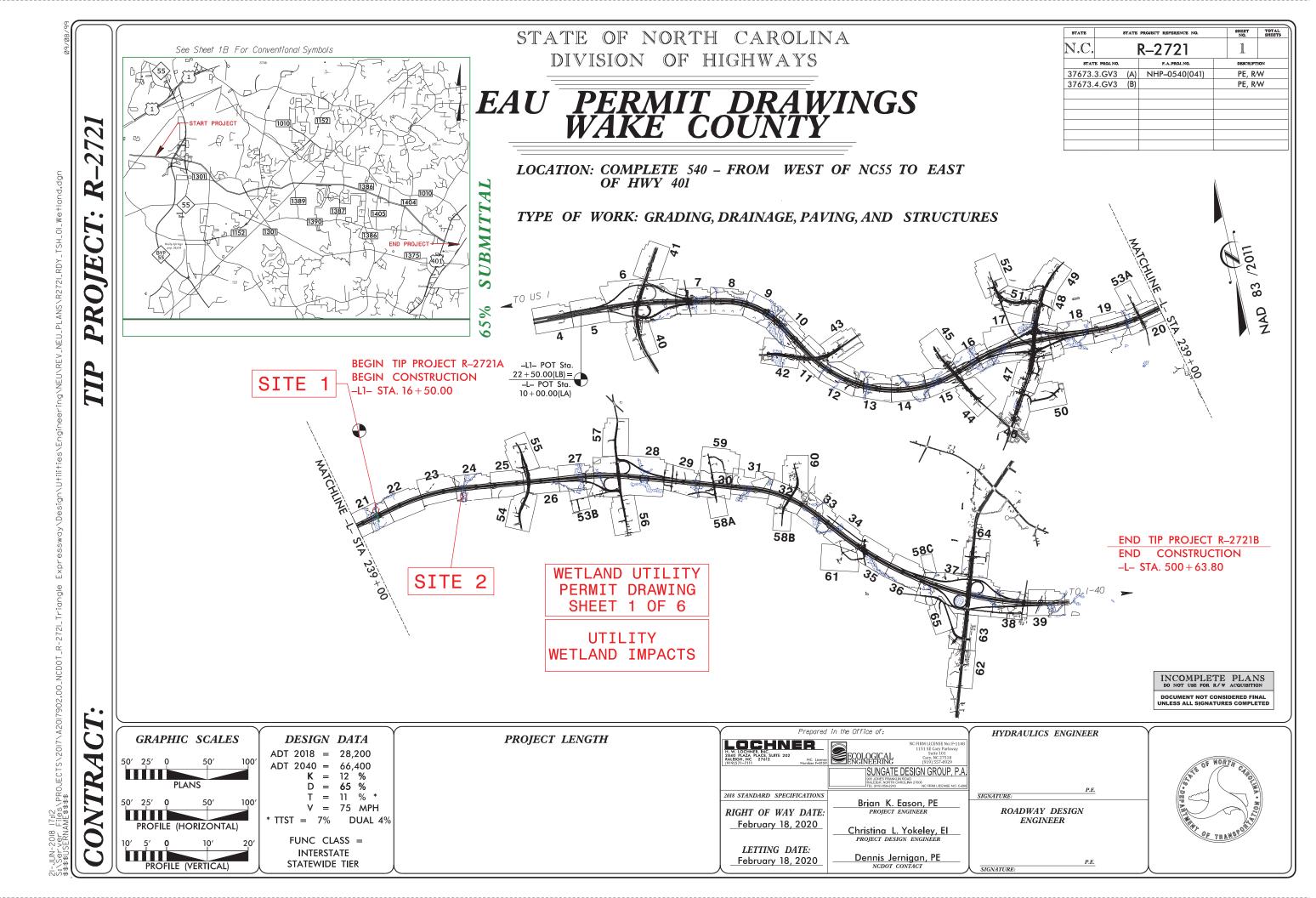
1. Station 247+52 to Station 247+89 -L-

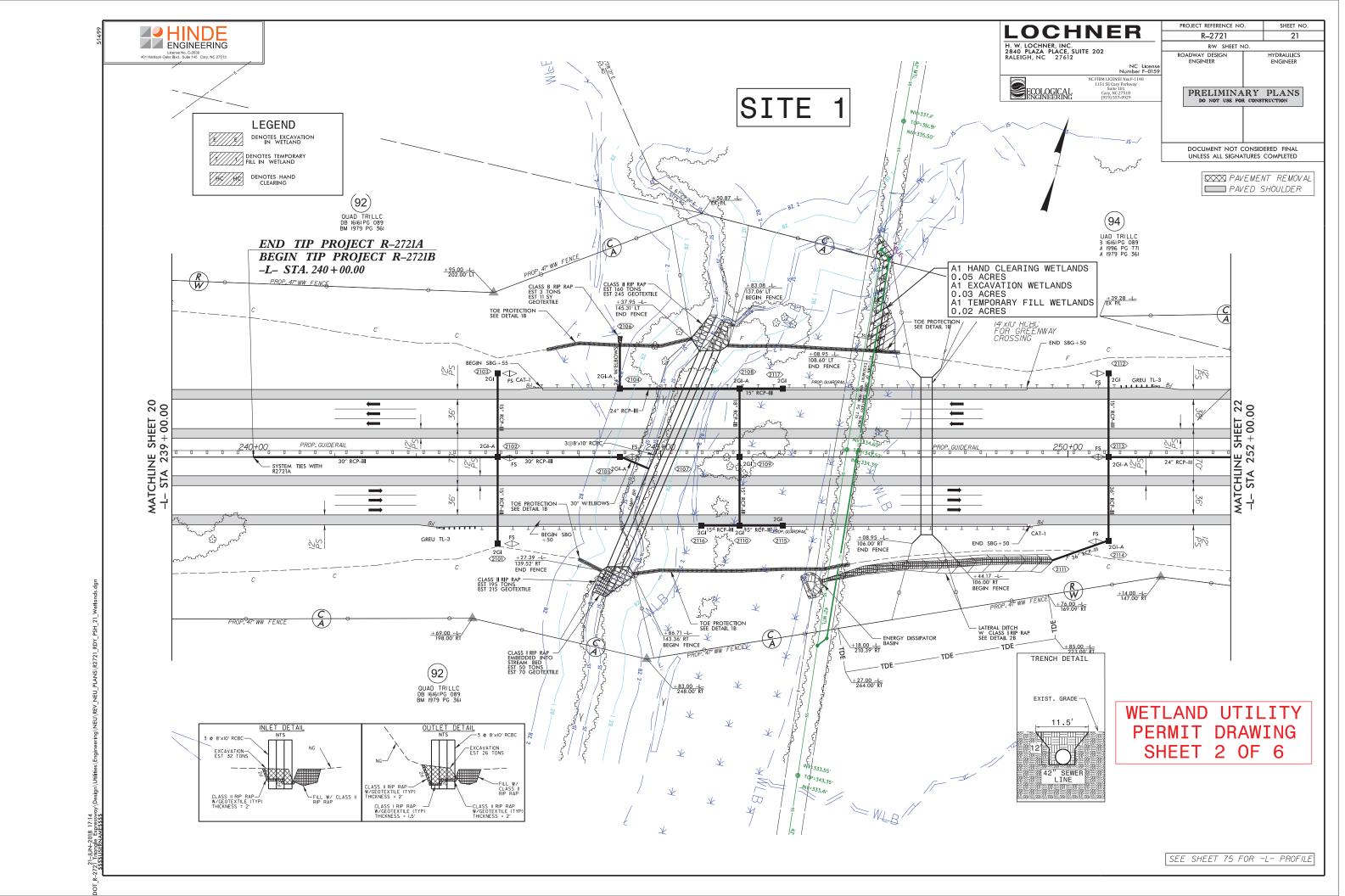
This gravity sewer line is 42 inches in diameter and is being relocated across the entire width of the right-of-way with all manholes being located outside the right-of-way and control of access. This will involve installation of approximately 500 linear feet of pipe and four new precast manholes and will require 0.05 acres of hand clearing, 0.03 acres of excavation in wetlands and approximately 0.02 acres of temporary fill in wetlands. These impacts have been listed on the impact summary sheet and noted on the plans.

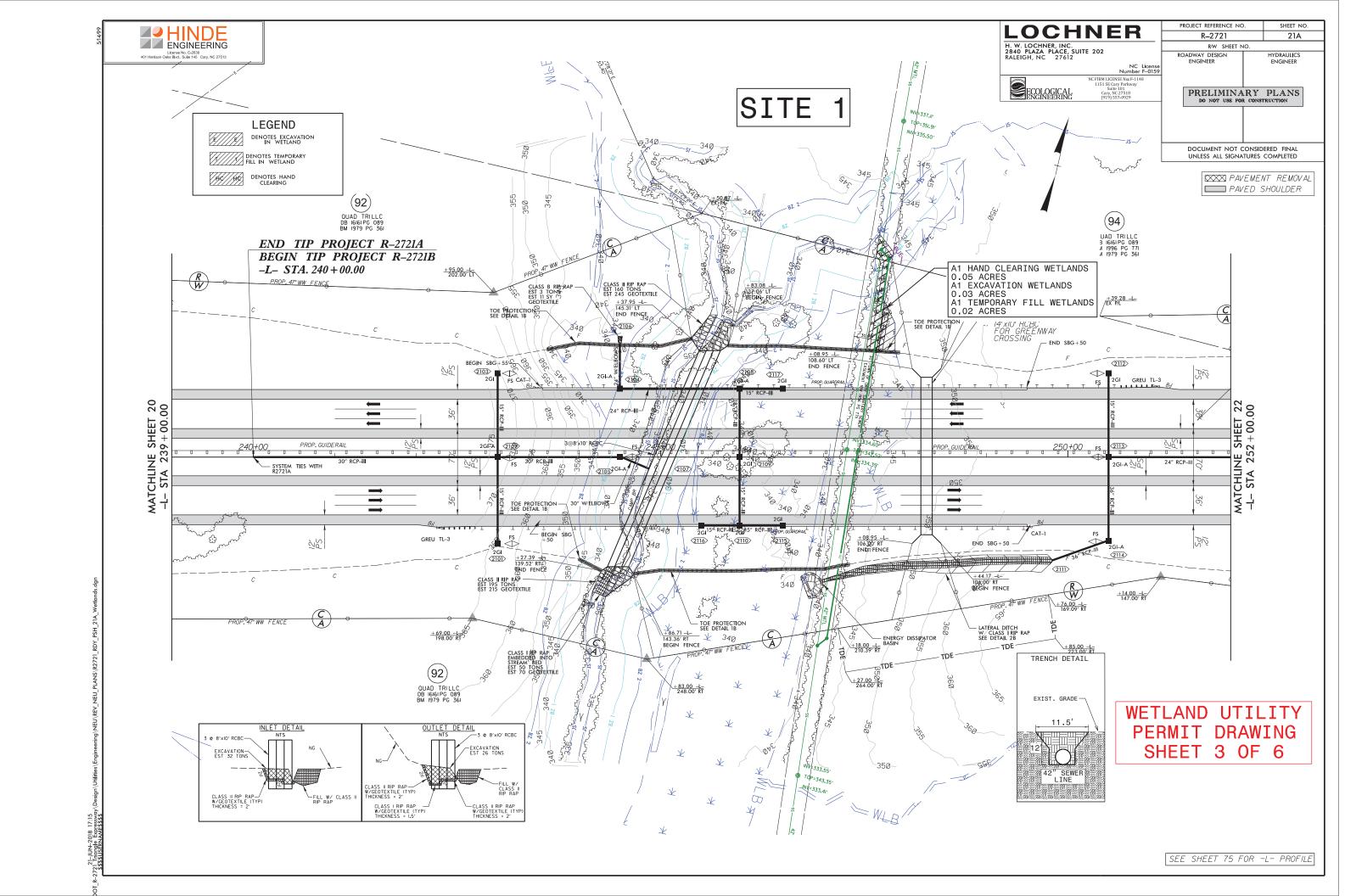
• Site A2:

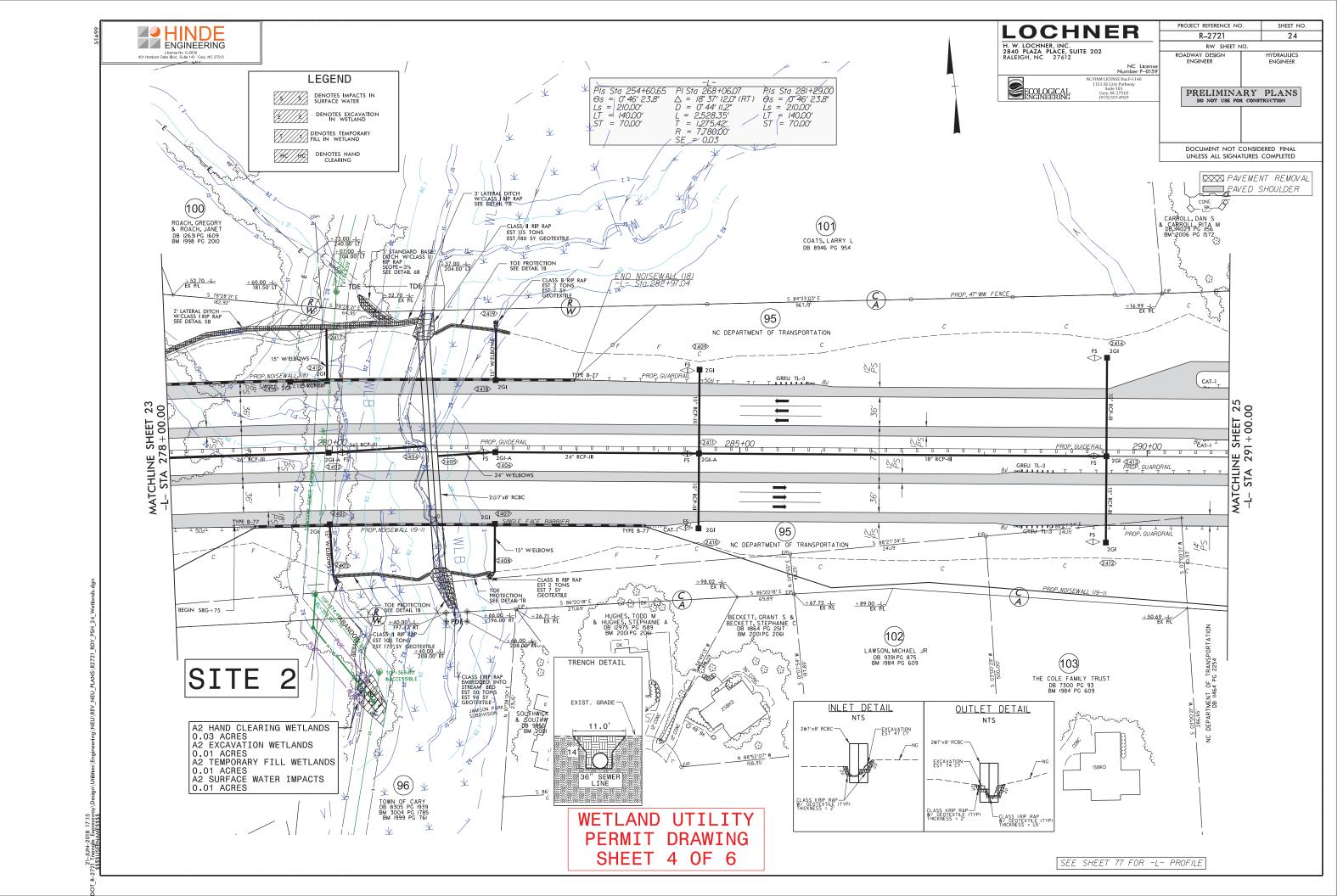
1. Station 280+27 to Station 280+65 -L-

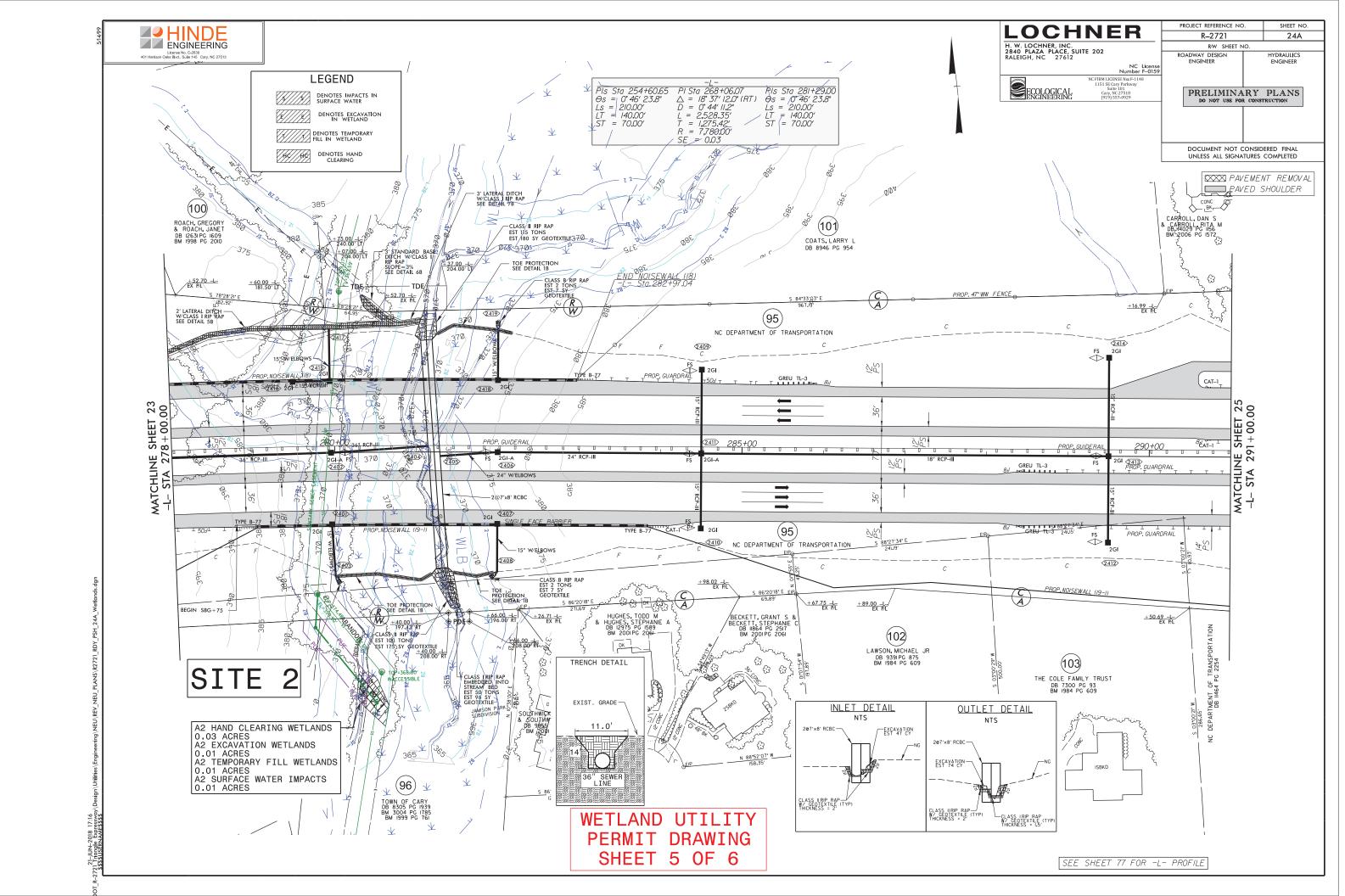
This gravity sewer line is 36 inches in diameter and is being relocated across the entire width of the right-of-way with all manholes being located outside the right-of-way and control of access. This will involve the relocation of 160 linear feet of pipe and three new precast manholes. This will require 0.03 acres of hand clearing, 0.01 acres of excavation in wetlands and 0.01 acres of temporary fill in wetlands, and 0.01 acres of temporary stream impact due to excavation across the existing jurisdictional stream (width of excavation will not exceed fifteen feet). These impacts have been listed on the impact summary sheet and noted on the plans.











				WE	TLAND IMPA	CTS			SURFA	CE WATER IN			
0:4-	Chatian	Structure	Permanent	Temp. Fill In		Mechanized	Hand Clearing	Permanent SW	Temp. SW	Existing Channel	Existing Channel	Natura Strean	
Site No.	Station (From/To)	Size / Type	Fill In Wetlands (ac)	Wetlands (ac)	in Wetlands (ac)	Clearing in Wetlands (ac)	in Wetlands (ac)		impacts (ac)	Impacts Permanent (ft)	Impacts Temp. (ft)	Design (ft)	
A1	247+52 to 247+89 -L-	42" Gravity Sewer		0.02	0.03*	,	0.05	,			\ /		
A2	280+27 to 280+65 -L-	36" Gravity Sewer		0.01	0.01*		0.03		0.01		15		
												-	
												-	
												1	

*Excavation in existing maintained sewer easement - Temporary Impact NOTES:

NC DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS

June 21, 2018 WAKE COUNTY R-2721 37673

SHEET 6 OF 6

Revised 2018 Feb