North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

General Project Information

WBS Element:	37673.1.TA2	**TIP Number:** R-2721A		**Project Type:** New Location	**Date:** 6/18/2018
NCDOT Contact:	Stephen R. Morgan, PE		**Contractor / Designer:**	William M. Hines, PE	
Address:	NCDOT Hydraulics Unit 1590 Mail Service Center Raleigh, NC 27699-1590		**Address:**	Sungate Design Group, P.A. 905 Jones Franklin Road Raleigh, NC 27606	
Phone:	(919)707-6739		**Phone:**	919-710-8454	
Email:	smorgan@ncdot.gov		**Email:**	whines@sungatedesign.com	
City/Town:	Holly Springs		**County(ies):**	Wake	
River Basin(s):	Neuse		**CAMA County?**	No	
Wetlands within Project Limits?	Yes				

Project Description

Project Length (lin. miles or feet):	4.6	**Surrounding Land Use:**	Residential

	Proposed Project	Existing Site
Project Built-Upon Area (ac.)	231.7 ac.	43.7 ac.
Typical Cross Section Description:	Grassed median ditch with 8:1 sides slopes. 3 paved lanes with 12' paved shoulders (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.	New Location
Annual Avg Daily Traffic (veh/hr/day):	Design/Future: 66,400 Year: 2040	Existing: 28,200 Year: 2018

General Project Narrative: (Description of Minimization of Water Quality Impacts)

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 a list of minimization efforts associated with water 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

Surface Water Body (1):	Middle Creek		**NCDWR Stream Index No.:**	27-43-15-(4)	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	Nutrient Sensitive Waters (NSW)		
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?		Comments:			
NRTR Stream ID:	SPX			**Buffer Rules in Effect:**	Neuse
Project Includes Bridge Spanning Water Body?	Yes	**Deck Drains Discharge Over Buffer?**	No	**Dissipator Pads Provided in Buffer?**	N/A
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)	
(If yes, provide justification in the General Project Narrative)					

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Additional Waterbody Information

Surface Water Body (2):	Rocky Branch		**NCDWR Stream Index No.:**	27-43-15-4.5		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	Nutrient Sensitive Waters (NSW)			
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SAD			**Buffer Rules in Effect:**		
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

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?
6	32+41-L-M 33+49-L-M	(1)Middle Creek	0.0	8.0	8.0	0.5	50	108	2.34%	1.5	1.6	1.9	1.7	No	Yes
6	33+49-L-M 35+00-L-M	(1)Middle Creek	0.0	8.0	8.0	0.2	20	151	0.93%	0.7	0.9	0.9	1.0	No	Yes
6	35+00-L-M 38+00-L-M	(1)Middle Creek	0.0	8.0	8.0	0.8	80	300	1.94%	2.2	1.6	2.8	1.7	No	Yes
6	38+00-L-M 42+50-L-M	(1)Middle Creek	0.0	8.0	8.0	1.1	110	450	2.59%	2.9	1.9	3.7	2.0	No	Yes
6	42+50-L-M 48+90-L-M	(1)Middle Creek	0.0	8.0	8.0	1.3	130	550	0.78%	3.6	1.3	4.7	1.4	No	Yes
6	23+50-Y1RPB-RT 24+93-Y1RPB-RT	(1)Middle Creek	0.0	6.0	4.0	0.5	50	143	4.91%	0.5	1.8	0.7	1.9	No	No
6	13+51-Y1LPB-LT 15+00-Y1LPB-LT	(1)Middle Creek	0.0	6.0	4.0	2.8	280	149	2.00%	6.3	2.0	8.1	2.2	No	Yes
6	24+93-Y1RPB-RT 27+88-Y1RPB-RT	(1)Middle Creek	2.0	6.0	4.0	0.5	50	295	4.80%	1.2	1.8	1.6	1.9	No	Yes
6	27+88-Y1RPB-RT 29+50-Y1RPB-RT	(1)Middle Creek	0.0	6.0	4.0	0.4	40	162	4.80%	1.1	1.8	1.4	1.9	No	Yes
6	29+50-Y1RPB-RT 30+50-Y1RPB-RT	(1)Middle Creek	0.0	6.0	4.0	0.2	20	100	4.80%	0.5	1.5	0.7	1.6	No	Yes
6	39+00-Y1-RT 39+50-Y1-RT	(1)Middle Creek	0.0	5.0	3.6	0.1	10	50	0.24%	0.5	0.6	0.6	0.6	No	Yes
6	39+50-Y1-RT 40+50-Y1-RT	(1)Middle Creek	0.0	5.0	4.2	0.2	20	100	0.15%	0.6	0.5	0.7	0.5	No	Yes
6	40+50-Y1-RT 41+82-Y1-RT	(1)Middle Creek	0.0	5.0	5.2	0.2	20	132	0.42%	0.8	0.8	1.0	0.8	No	Yes
6	41+82-Y1-RT 43+88-Y1-RT	(1)Middle Creek	0.0	5.0	6.3	0.4	40	205	0.49%	1.4	0.9	1.7	1.0	No	Yes
7	48+00-L-M 48+90-L-M	(1)Middle Creek	0.0	8.0	8.0	0.2	20	90	0.32%	0.7	0.6	0.9	0.7	No	No
7	51+00-L-M 52+50-L-M	(1)Middle Creek	0.0	7.9	7.8	0.8	80	150	0.94%	2.0	1.2	2.5	1.3	No	Yes
7	52+50-L-M 55+50-L-M	(1)Middle Creek	0.0	7.7	8.0	0.7	70	300	1.52%	1.9	1.4	2.5	1.5	No	Yes
7	55+50-L-M 58+50-L-M	(1)Middle Creek	0.0	8.0	8.0	0.7	70	300	1.44%	1.9	1.4	2.4	1.5	No	Yes
8	58+50-L-M 61+50-L-M	(1)Middle Creek	0.0	8.0	7.3	0.7	70	300	1.57%	1.9	1.4	2.4	1.5	No	Yes

Additional Comments

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WBS Element: 37673.1.TA2 **TIP No.:** R-2721A **County(ies):** Wake

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?
8	61+50-L-M 64+50-L-M	(1)Middle Creek	0.0	8.0	5.6	0.8	80	300	1.76%	2.1	1.6	2.7	1.7	No	Yes
8	64+50-L-M 67+50-L-M	(1)Middle Creek	0.0	8.0	4.5	0.8	80	300	1.64%	2.5	1.6	3.2	1.8	No	Yes
8	67+50-L-M 70+40-L-M	(1)Middle Creek	0.0	8.0	4.4	0.7	70	290	1.59%	2.4	1.6	3.1	1.7	No	Yes
9	70+40-L-M 73+50-L-M	(1)Middle Creek	0.0	8.0	4.4	0.8	80	310	1.50%	2.6	1.6	3.3	1.7	No	Yes
9	73+50-L-M 76+50-L-M	(1)Middle Creek	0.0	8.0	4.4	0.8	80	300	1.73%	2.5	1.7	3.2	1.8	No	Yes
9	76+50-L-M 79+50-L-M	(1)Middle Creek	0.0	8.0	4.4	0.8	80	300	2.27%	2.5	1.9	3.2	2.0	No	Yes
9	79+50-L-M 82+50-L-M	(1)Middle Creek	0.0	8.0	4.6	0.7	70	300	2.49%	2.4	1.8	3.1	2.0	No	Yes
10	85+50-L-M 87+00-L-M	(1)Middle Creek	0.0	8.0	5.1	1.1	110	150	0.45%	4.2	1.1	5.4	1.2	No	Yes
10	87+00-L-M 89+30-L-M	(1)Middle Creek	0.0	8.0	5.5	0.5	50	230	0.17%	1.3	0.6	1.7	0.6	No	Yes
10	87+50-L-LT 88+50-L-LT	(1)Middle Creek	0.0	6.0	3.0	0.2	20	100	0.30%	0.3	0.5	0.3	0.6	No	Yes
10	88+50-L-LT 92+54-L-LT	(1)Middle Creek	0.0	6.0	4.0	1.8	180	404	4.00%	4.0	1.0	5.2	1.1	No	Yes
10	89+30-L-M 90+00-L-M	(1)Middle Creek	0.0	8.0	6.6	0.2	20	70	0.20%	0.4	0.5	0.5	0.5	No	Yes
10	90+00-L-M 91+00-L-M	(1)Middle Creek	0.0	8.0	7.0	0.2	20	100	0.14%	0.7	0.4	0.8	0.5	No	Yes
10	91+00-L-M 94+50-L-M	(1)Middle Creek	0.0	8.0	7.8	0.8	80	350	0.10%	2.1	0.5	2.7	0.6	No	Yes
10	91+00-L-RT 94+50-L-RT	(1)Middle Creek	0.0	6.0	4.0	0.9	90	350	0.59%	2.2	1.0	2.8	1.1	No	Yes
10	92+50-L-LT 93+50-L-LT	(1)Middle Creek	0.0	6.0	4.0	0.4	40	100	0.16%	0.8	0.6	1.1	0.6	No	Yes
10	93+50-L-LT 94+50-L-LT	(1)Middle Creek	0.0	6.0	4.0	0.8	80	100	1.04%	1.3	1.3	1.7	1.3	No	Yes
10	94+50-L-LT 96+50-L-LT	(1)Middle Creek	0.0	6.0	4.0	1.0	100	200	0.50%	2.3	1.1	3.0	1.2	No	Yes
10	94+50-L-M 98+80-L-M	(1)Middle Creek	0.0	7.8	8.0	0.9	90	430	0.43%	2.6	1.0	3.3	1.5	No	Yes

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10	94+50-L-RT 98+80-L-RT	(1)Middle Creek	0.0	6.0	4.0	1.4	140	430	1.17%	3.6	1.4	4.6	1.5	No	Yes
11	96+50-L-LT 98+80-L-LT	(1)Middle Creek	0.0	6.0	4.0	2.0	200	230	0.41%	4.8	1.2	6.1	1.3	No	Yes
11	98+80-L-M 99+50-L-RT	(1)Middle Creek	0.0	6.0	4.0	0.7	70	70	1.03%	1.7	1.1	2.1	1.2	No	Yes
11	98+50-L-M 99+50-L-M	(1)Middle Creek	0.0	21.0	14.8	0.4	40	70	2.58%	1.0	1.2	1.3	1.3	No	Yes
11	98+50-L-LT 100+50-L-LT	(1)Middle Creek	0.0	6.0	4.0	1.1	110	170	0.11%	2.8	0.6	3.6	0.7	No	Yes
11	100+50-L-LT 101+50-L-LT	(1)Middle Creek	0.0	6.0	4.0	1.6	160	100	1.63%	4.0	1.7	5.2	1.8	No	Yes
11	103+50-L-RT 109+68-L-RT	(1)Middle Creek	0.0	6.0	4.0	1.5	150	618	1.83%	3.5	1.7	4.5	1.8	No	Yes
11	107+50-L-M 109+68-L-M	(1)Middle Creek	0.0	5.3	8.0	0.5	50	218	1.93%	1.3	1.5	1.7	1.6	No	Yes
11	107+50-L-LT 109+68-L-LT	(1)Middle Creek	0.0	6.0	4.0	0.9	90	218	2.21%	2.3	1.6	2.9	1.7	No	Yes
12	109+68-L-M 112+75-L-M	(1)Middle Creek	0.0	5.3	8.0	0.7	70	307	3.13%	1.8	1.9	2.4	2.0	No	Yes
12	109+68-L-LT 112+75-L-LT	(1)Middle Creek	0.0	6.0	4.0	1.2	120	307	2.98%	3.2	2.0	4.1	2.1	No	Yes
12	109+68-L-RT 115+83-L-RT	(1)Middle Creek	0.0	6.0	4.0	1.5	150	370	2.97%	2.5	1.9	3.1	2.0	No	Yes
12	112+75-L-M 115+83-L-M	(1)Middle Creek	0.0	5.3	8.0	0.7	70	308	3.05%	1.8	1.9	2.4	2.0	No	Yes
12	112+75-L-LT 116+45-L-LT	(1)Middle Creek	0.0	6.0	4.0	1.5	150	370	2.85%	3.9	2.1	5.0	2.2	No	Yes
13	124+80-L-M 127+70-L-M	(1)Middle Creek	0.0	5.3	8.0	0.8	80	380	0.33%	2.3	0.9	2.9	0.9	No	Yes
13	127+70-L-M 131+50-L-M	(1)Middle Creek	0.0	5.3	8.0	0.7	70	380	0.68%	1.9	1.1	2.5	1.2	No	Yes
13	128+00-L-LT 131+50-L-LT	(1)Middle Creek	0.0	6.0	4.0	1.2	120	380	0.58%	3.2	1.2	4.1	1.3	No	Yes
14	131+50-L-M 135+25-L-M	(1)Middle Creek	0.0	5.3	8.0	0.8	80	375	0.10%	2.2	0.6	2.9	0.6	No	Yes
14	131+50-L-LT 135+25-L-LT	(1)Middle Creek	0.0	6.0	4.0	1.4	140	375	0.69%	3.4	1.4	4.3	1.4	No	Yes

Additional Comments

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Swales

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14	135+25-L-M 139+00-L-M	(1)Middle Creek	0.0	5.3	8.0	0.8	80	375	0.74%	2.2	1.2	2.9	1.3	No	Yes
14	139+00-L-M 141+50-L-M	(1)Middle Creek	0.0	5.3	8.0	0.5	50	250	0.69%	1.5	1.0	1.9	1.1	No	Yes
14	141+50-L-M 142+50-L-M	(1)Middle Creek	0.0	5.3	8.0	0.2	20	100	0.70%	0.6	0.8	0.8	0.9	No	Yes
14	142+50-L-M 144+93-L-M	(1)Middle Creek	0.0	5.3	8.0	0.5	50	243	0.38%	1.5	0.8	1.9	0.9	No	Yes
14	143+22-L-LT 144+93-L-LT	(1)Middle Creek	0.0	6.0	4.0	0.5	50	171	0.19%	3.2	0.8	4.1	0.9	No	Yes
14	144+93-L-M 146+00-L-M	(1)Middle Creek	0.0	5.0	8.0	0.2	20	107	0.19%	0.7	0.5	0.8	0.6	No	Yes
14	146+00-L-M 150+00-L-M	(1)Middle Creek	0.0	5.3	8.0	0.9	90	400	0.50%	2.4	1.0	3.1	1.1	No	Yes
15	150+00-L-M 152+75-L-M	(1)Middle Creek	0.0	5.3	8.0	0.6	60	275	0.47%	1.6	0.9	2.1	1.0	No	Yes
15	152+75-L-M 155+50-L-M	(1)Middle Creek	0.0	6.2	11.6	0.6	60	275	0.69%	1.7	1.0	2.1	1.1	No	Yes
15	154+00-L-LT 155+50-L-LT	(1)Middle Creek	0.0	6.0	3.0	0.4	40	150	1.20%	1.2	1.3	1.6	1.4	No	Yes
15	155+00-L-RT 158+50-L-RT	(1)Middle Creek	0.0	6.0	2.0	0.9	90	350	0.32%	1.6	0.9	2.0	0.9	No	Yes
15	155+50-L-LT 158+10-L-LT	(1)Middle Creek	0.0	6.0	3.0	1.1	110	260	0.32%	2.8	1.0	3.6	1.1	No	Yes
15	159+97-L-RT 160+50-L-RT	(2)Rocky Branch	0.0	6.0	3.0	0.6	60	54	6.41%	0.3	1.8	0.4	1.9	No	Yes
16	160+50-L-RT 162+00-L-RT	(2)Rocky Branch	0.0	7.9	12.5	0.2	20	150	0.27%	0.8	0.6	1.0	0.6	No	Yes
16	160+50-L-RT 164+50-L-RT	(2)Rocky Branch	0.0	6.0	3.0	0.7	70	400	0.69%	1.8	1.2	2.4	1.3	No	Yes
16	160+50-L-LT 162+00-L-LT	(2)Rocky Branch	0.0	7.3	3.3	0.6	60	150	0.71%	1.9	1.2	2.4	1.2	No	Yes
16	162+00-L-RT 164+50-L-M	(2)Rocky Branch	0.0	15.1	13.6	0.6	60	250	1.32%	1.5	1.1	1.9	1.2	No	Yes
16	164+50-L-M 165+31-L-M	(2)Rocky Branch	0.0	8.0	8.0	0.2	20	81	0.12%	0.5	0.4	0.6	0.4	No	Yes

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16	165+31-L-M 165+97-L-M	(2)Rocky Branch	0.0	8.0	8.0	0.1	10	66	0.10%	0.4	0.3	0.5	0.4	No	Yes
16	165+97-L-M 170+54-L-M	(2)Rocky Branch	0.0	8.0	8.0	1.1	110	457	0.42%	3.1	1.0	4.0	1.0	No	Yes
16	170+54-L-M 174+50-L-M	(2)Rocky Branch	0.0	8.0	8.0	1.0	100	410	0.32%	2.8	0.9	3.6	0.9	No	Yes
17	173+24-L-RT 176+59-L-RT	(2)Rocky Branch	0.0	4.0	6.0	0.7	70	335	0.97%	2.2	1.4	2.9	1.5	No	Yes
17	174+50-L-M 176+59-L-M	(2)Rocky Branch	0.0	8.0	5.3	0.5	50	209	0.16%	1.4	0.6	1.9	0.6	No	Yes
17	176+59-L-M 179+21-L-M	(2)Rocky Branch	0.0	8.0	5.3	0.7	70	262	0.50%	2.0	1.0	2.6	1.0	No	Yes
17	176+59-L-RT 181+21-L-RT	(2)Rocky Branch	0.0	5.1	5.1	1.7	170	462	0.37%	3.8	1.1	4.9	1.2	No	Yes
17	179+21-L-M 181+21-L-M	(2)Rocky Branch	0.0	8.0	5.3	0.5	50	200	0.55%	1.4	0.9	1.8	1.0	No	Yes
17	179+86-L-LT 186+50-L-LT	(2)Rocky Branch	0.0	4.2	6.2	1.3	130	664	1.01%	2.4	1.4	3.1	1.5	No	Yes
17	181+21-L-M 185+00-L-M	(2)Rocky Branch	0.0	8.0	5.3	0.8	80	379	0.55%	2.3	1.1	2.9	1.1	No	Yes
17	181+21-L-RT 185+00-L-RT	(2)Rocky Branch	0.0	6.0	4.0	1.5	150	379	0.61%	3.4	1.3	4.4	1.4	No	Yes
17	185+00-L-RT 186+50-L-RT	(2)Rocky Branch	0.0	6.0	4.0	0.6	60	150	0.40%	1.5	0.9	1.9	0.9	No	Yes
17	185+00-L-M 186+50-L-M	(2)Rocky Branch	0.0	8.0	5.3	0.3	30	150	0.47%	0.9	0.8	1.2	0.8	No	Yes
17	186+50-L-M 188+00-L-RT	(2)Rocky Branch	0.0	16.9	39.9	0.3	30	150	0.40%	0.8	0.5	1.1	0.5	No	Yes
17	186+50-L-LT 188+00-L-LT	(2)Rocky Branch	0.0	6.0	4.0	0.4	40	150	0.53%	0.7	0.8	0.9	0.9	No	Yes
17	186+50-L-RT 189+50-L-RT	(2)Rocky Branch	0.0	6.0	4.0	1.3	130	300	0.40%	2.9	1.1	3.8	1.1	No	Yes
17	188+00-L-LT 189+00-L-LT	(2)Rocky Branch	0.0	12.3	3.7	0.2	20	100	1.11%	0.4	0.8	0.5	0.9	No	Yes
17	188+00-L-RT 189+00-L-RT	(2)Rocky Branch	0.0	34.4	20.7	0.2	20	100	0.50%	0.5	0.5	0.7	0.5	No	Yes
17	188+00-L-RT 192+00-L-RT	(2)Rocky Branch	0.0	6.7	25.0	0.4	40	400	0.49%	1.0	0.7	1.2	0.7	No	Yes

Additional Comments

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?
17	189+00-L-LT 190+00-L-LT	(2)Rocky Branch	0.0	6.3	17.2	0.1	10	100	0.50%	0.4	0.6	0.6	0.6	No	Yes
17	189+00-L-LT 190+00-L-LT	(2)Rocky Branch	0.0	25.0	3.0	0.2	20	100	0.61%	0.5	0.6	0.6	0.6	No	Yes
17	189+50-L-RT 190+00-L-RT	(2)Rocky Branch	0.0	6.0	3.0	0.4	40	50	0.35%	0.6	0.7	0.8	0.8	No	Yes
17	190+00-L-LT 192+00-L-LT	(2)Rocky Branch	0.0	4.2	35.6	0.2	20	200	0.50%	0.6	0.5	0.8	0.5	No	Yes
17	192+00-L-LT 194+00-L-LT	(2)Rocky Branch	0.0	7.1	12.5	0.2	20	200	0.65%	0.6	0.7	0.8	0.8	No	Yes
17	192+00-L-RT 194+00-L-RT	(2)Rocky Branch	0.0	7.1	12.5	0.2	20	200	0.65%	0.6	0.7	0.8	0.8	No	Yes
17	192+00-L-LT 194+00-L-LT	(2)Rocky Branch	0.0	4.0	4.1	1.2	120	200	2.30%	2.5	1.8	3.2	1.9	No	Yes
17	194+00-L-LT 196+50-L-LT	(2)Rocky Branch	0.0	4.0	3.9	0.9	90	250	0.32%	1.9	0.9	2.4	1.0	No	Yes
17	195+50-L-RT 199+00-L-RT	(2)Rocky Branch	0.0	6.0	4.0	0.9	90	350	0.54%	2.2	1.2	2.8	1.2	No	Yes
17	195+00-L-LT 196+50-L-M	(2)Rocky Branch	0.0	15.8	15.8	0.5	50	150	1.93%	1.5	1.2	1.9	1.3	No	Yes
17	196+50-L-LT 197+00-L-LT	(2)Rocky Branch	0.0	6.0	4.0	0.1	10	50	0.06%	0.3	0.3	0.4	0.3	No	Yes
17	196+50-L-M 199+00-L-M	(2)Rocky Branch	0.0	8.0	8.0	0.5	50	250	0.52%	1.5	0.9	1.9	0.9	No	Yes
17	197+00-L-LT 199+00-L-LT	(2)Rocky Branch	0.0	6.0	4.0	0.5	50	50	0.06%	0.3	0.3	0.4	0.3	No	Yes
18	199+00-L-RT 200+50-L-RT	(2)Rocky Branch	0.0	6.0	4.0	0.4	40	150	1.33%	0.9	1.2	1.1	1.3	No	Yes
18	199+00-L-M 200+50-L-M	(2)Rocky Branch	0.0	8.0	8.0	0.5	50	150	0.91%	1.5	1.1	1.9	1.2	No	Yes
18	199+50-L-LT 200+25-L-LT	(2)Rocky Branch	0.0	3.9	3.9	0.1	10	75	0.23%	0.3	0.5	0.4	0.6	No	Yes
18	200+25-L-LT 201+50-L-LT	(2)Rocky Branch	0.0	4.0	4.0	0.2	20	125	0.10%	0.5	0.4	0.7	0.5	No	Yes
18	200+50-L-RT 202+38-L-RT	(2)Rocky Branch	0.0	4.4	7.6	0.3	30	188	1.27%	0.3	0.5	0.4	0.6	No	Yes
18	201+50-L-LT 202+47-L-LT	(2)Rocky Branch	0.0	4.0	4.0	0.1	10	97	0.44%	0.4	0.7	0.5	0.8	No	Yes

Additional Comments

PERMIT DRAWING SHEET 1 OF 119

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

WBS Element: 37673.1.TA2 **TIP No.:** R-2721A **County(ies):** Wake

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?
18	201+50-L-M 202+93-L-M	(2)Rocky Branch	0.0	8.0	8.0	0.3	30	143	0.56%	0.9	0.8	1.1	0.8	No	Yes
18	202+93-L-M 209+00-L-M	(2)Rocky Branch	0.0	8.0	8.0	1.3	130	607	0.54%	2.4	1.0	3.1	1.1	No	Yes
18	209+00-L-M 211+97-L-M	(2)Rocky Branch	0.0	7.9	8.0	0.6	60	297.0	0.71%	1.8	1.0	2.3	1.1	No	Yes
19	211+97-L-M 214+25-L-M	(2)Rocky Branch	0.0	6.8	8.0	0.6	60	228	0.35%	1.6	0.8	2.1	0.8	No	Yes
19	213+22-L-LT 216+50-L-LT	(2)Rocky Branch	0.0	5.5	3.9	1.0	100	328	2.60%	2.6	1.5	3.3	1.6	No	Yes
19	214+25-L-M 216+50-L-M	(2)Rocky Branch	0.0	6.1	8.0	0.5	50	225	0.58%	1.5	1.0	1.9	1.0	No	Yes
19	214+00-L-RT 219+65-L-RT	(2)Rocky Branch	0.0	6.0	4.1	0.7	70	565	1.02%	1.3	1.2	1.6	1.3	No	Yes
19	216+50-L-LT 219+66-L-LT	(2)Rocky Branch	0.0	6.0	4.0	1.4	140	316	0.54%	3.1	1.2	4.0	1.3	No	Yes
19	216+50-L-M 219+66-L-M	(2)Rocky Branch	0.0	6.1	8.0	0.7	70	316	0.54%	2.0	1.0	2.6	1.0	No	Yes
19	219+65-L-RT 224+00-L-RT	(2)Rocky Branch	0.0	6.0	4.1	0.6	60	435	0.55%	1.1	0.9	1.4	1.0	No	Yes
19	219+66-L-M 224+00-L-M	(2)Rocky Branch	0.0	6.1	8.0	0.9	90	633	0.38%	2.6	0.9	3.4	1.0	No	Yes
19	219+66-L-LT 224+00-L-LT	(2)Rocky Branch	0.0	6.0	4.0	2.0	200	434	0.55%	4.5	1.3	5.8	1.4	No	Yes
19	224+00-L-M 225+99-L-M	(2)Rocky Branch	0.0	6.1	8.0	0.4	40	97	1.02%	1.2	1.1	1.5	1.2	No	Yes
20	224+00-L-LT 226+38-L-LT	(2)Rocky Branch	0.0	6.0	4.0	1.5	150	238	0.52%	3.3	1.2	4.3	1.3	No	Yes
20	225+98-L-M 226+96-L-M	(2)Rocky Branch	0.0	6.1	8.0	0.2	20	54	0.30%	0.6	0.6	0.8	0.6	No	Yes
20	226+38-L-LT 227+50-L-LT	(2)Rocky Branch	0.0	6.0	2.1	0.2	20	112	0.50%	0.7	0.9	1.0	0.9	No	Yes
20	226+96-L-M 227+50-L-M	(2)Rocky Branch	0.0	9.4	16.6	0.1	10	54	3.41%	0.3	1.1	0.4	1.2	No	Yes
20	227+50-L-M 228+50-L-RT	(2)Rocky Branch	0.0	12.7	25.2	0.6	60	100	1.01%	0.6	0.7	0.8	0.8	No	Yes
20	227+50-L-RT 230+00-L-RT	(2)Rocky Branch	0.0	15.5	4.0	0.5	50	250	1.10%	0.9	1.0	1.2	1.1	No	Yes

Additional Comments

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

WBS Element: 37673.1.TA2 **TIP No.:** R-2721A **County(ies):** Wake

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?
20	227+50-L-LT 231+50-L-LT	(2)Rocky Branch	0.0	10.2	3.6	1.7	170	350	1.12%	3.8	1.6	4.9	1.6	No	Yes
20	228+50-L-RT 229+44-L-RT	(2)Rocky Branch	0.0	11.2	12.5	0.2	20	94	0.10%	0.5	0.3	0.6	0.4	No	Yes
20	229+44-L-RT 230+00-L-RT	(2)Rocky Branch	0.0	5.6	12.5	0.1	10	56	0.01%	0.3	0.2	0.4	0.2	No	Yes
20	230+00-L-RT 230+50-L-RT	(2)Rocky Branch	0.0	29.1	2.0	0.1	10	50	0.14%	0.1	0.2	0.1	0.3	No	Yes
20	230+00-L-RT 232+00-L-RT	(2)Rocky Branch	0.0	4.4	16.6	0.3	30	200	0.29%	0.9	0.6	1.1	0.6	No	Yes
20	230+50-L-RT 232+00-L-RT	(2)Rocky Branch	0.0	26.4	2.5	0.1	10	150	2.28%	0.2	0.8	0.3	0.9	No	Yes
20	231+50-L-LT 232+25-L-LT	(2)Rocky Branch	0.0	25.1	2.0	0.4	40	75	0.60%	0.8	0.7	1.1	0.8	No	Yes
20	232+00-L-RT 233+25-L-RT	(2)Rocky Branch	0.0	6.0	12.5	0.2	20	125	0.72%	0.7	0.8	0.9	0.8	No	Yes
20	232+00-L-RT 234+50-L-RT	(2)Rocky Branch	0.0	5.7	4.0	1.0	100	250	0.84%	2.0	1.3	2.6	1.4	No	Yes
20	232+25-L-LT 233+50-L-LT	(2)Rocky Branch	0.0	18.7	2.0	0.5	50	125	1.28%	1.1	1.1	1.4	1.1	No	Yes
20	233+25-L-RT 234+50-L-RT	(2)Rocky Branch	0.0	14.1	12.5	0.2	20	125	0.64%	0.7	0.7	0.9	0.7	No	Yes
20	233+50-L-LT 235+00-L-LT	(2)Rocky Branch	0.0	6.0	4.0	0.6	60	150	1.73%	1.4	1.5	1.8	1.6	No	Yes
20	234+50-L-RT 235+00-L-M	(2)Rocky Branch	0.0	25.0	59.6	0.1	10	50	1.40%	0.3	0.6	0.4	0.6	No	Yes
20	234+50-L-RT 238+25-L-RT	(2)Rocky Branch	0.0	6.0	4.0	0.9	90	375	1.02%	1.9	1.4	2.4	1.4	No	Yes
20	235+00-L-LT 238+25-L-LT	(2)Rocky Branch	0.0	6.0	4.0	1.3	130	325	0.62%	2.6	1.2	3.3	1.3	No	Yes
20	235+00-L-M 238+25-L-M	(2)Rocky Branch	0.0	10.5	16.1	0.7	70	325	1.42%	2.0	1.3	2.6	1.3	No	Yes
6	20+00-Y1RPC-LT 23+50-Y1RPC-LT	(1)Middle Creek	0.0	6.0	4.1	0.7	70	350	5.04%	0.9	2.1	1.2	2.2	No	Yes
6	20+00-Y1RPC-RT 23+50-Y1RPC-RT	(1)Middle Creek	0.0	6.0	4.0	1.0	100	350	4.62%	2.3	2.2	3.0	2.3	No	Yes
6	23+50-Y1RPC-RT 26+75-Y1RPC-RT	(1)Middle Creek	0.0	6.0	4.0	0.8	80	325	4.16%	1.5	1.9	2.0	2.0	No	Yes

Additional Comments

PERMIT DRAWING SHEET 3 OF 119

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

WBS Element: 37673.1.TA2 **TIP No.:** R-2721A **County(ies):** Wake

Swales

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6	25+50-Y1-LT 31+15-Y1-LT	(1)Middle Creek	0.0	13.0	22.3	1.1	110	565	0.97%	3.3	1.1	4.3	1.2	No	Yes
6	31+15-Y1-LT 31+75-Y1-LT	(1)Middle Creek	0.0	7.0	9.0	0.1	10	60	0.50%	0.4	0.6	0.5	0.7	No	Yes
6	39+00-Y1-RT 39+50-Y1-RT	(1)Middle Creek	0.0	5.0	3.6	0.1	10	50	0.24%	0.5	0.6	0.6	0.6	No	Yes
6	39+50-Y1-RT 40+50-Y1-RT	(1)Middle Creek	0.0	5.0	4.2	0.2	20	100	0.15%	0.6	0.5	0.7	0.5	No	Yes
6	39+50-Y1-LT 41+00-Y1-LT	(1)Middle Creek	0.0	6.0	4.0	1.7	170	150	0.30%	3.2	1.0	4.1	1.0	No	Yes
6	40+50-Y1-RT 41+82-Y1-RT	(1)Middle Creek	0.0	5.0	5.2	0.2	20	133	0.41%	0.8	0.8	1.0	0.8	No	Yes
6	41+00-Y1-LT 41+58-Y1-LT	(1)Middle Creek	0.0	6.0	4.0	0.1	10	58	1.38%	0.4	1.0	0.5	1.1	No	Yes
6	41+58-Y1-LT 43+88-Y1-LT	(1)Middle Creek	0.0	6.0	4.0	0.8	80	230	0.21%	1.8	0.7	2.4	0.8	No	Yes
6	41+82-Y1-RT 43+88-Y1-RT	(1)Middle Creek	0.0	5.0	6.6	0.4	40	205	0.49%	1.3	0.9	1.7	1.0	No	Yes
6	13+51-Y1LPB-LT 15+00-Y1LPB-LT	(1)Middle Creek	0.0	4.0	2.0	2.8	280	149	2.00%	6.3	2.3	8.1	2.4	No	Yes
6	23+50-Y1RPC-LT 26+75-Y1RPC-LT	(1)Middle Creek	0.0	6.0	4.3	1.9	190	325	6.50%	3.3	2.7	4.2	2.8	No	Yes
6	26+75-Y1RPC-LT 27+50-Y1RPC-LT	(1)Middle Creek	0.0	4.0	2.0	0.2	20	75	0.31%	0.5	0.7	0.7	0.7	No	Yes
6	26+75-Y1RPC-RT 28+56-Y1RPC-RT	(1)Middle Creek	0.0	6.0	4.0	0.3	30	181	4.46%	0.4	1.6	0.6	1.7	No	Yes
6	28+56-Y1RPC-RT 29+50-Y1RPC-RT	(1)Middle Creek	0.0	6.0	4.0	0.2	20	94	4.57%	0.2	1.3	0.3	1.5	No	Yes
6	23+50-Y1RPB-RT 24+93-Y1RPB-RT	(1)Middle Creek	0.0	6.0	3.4	0.5	50	143	4.92%	0.7	1.9	0.9	2.1	No	Yes
6	24+93-Y1RPB-RT 27+88-Y1RPB-RT	(1)Middle Creek	0.0	5.8	4.4	0.5	50	295	4.76%	1.2	1.9	1.6	2.1	No	Yes
6	27+88-Y1RPB-RT 29+50-Y1RPB-RT	(1)Middle Creek	0.0	5.6	4.3	0.4	40	162	4.63%	1.1	1.8	1.4	1.9	No	Yes
6	29+50-Y1RPB-RT 30+50-Y1RPB-RT	(1)Middle Creek	0.0	5.8	5.2	0.2	20	100	1.80%	0.5	1.2	0.7	1.3	No	Yes
45	34+26-Y4-LT 36+50-Y4-LT	(1)Middle Creek	0.0	5.7	6.0	1.3	130	224	0.91%	2.2	1.3	2.8	1.4	No	Yes

Additional Comments

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Highway Stormwater Program

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WBS Element: 37673.1.TA2 **TIP No.:** R-2721A **County(ies):** Wake

Swales

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17	27+00-Y5-LT 27+50-Y5-LT	(2)Rocky Branch	0.0	4.0	3.0	0.1	10	50	0.30%	0.1	0.4	0.1	0.4	No	Yes
17	27+50-Y5-RT 28+50-Y5-RT	(2)Rocky Branch	0.0	4.0	3.0	1.5	150	100	3.18%	3.3	2.2	4.2	2.4	No	Yes
49	68+36-Y5-RT 69+50-Y5-RT	(2)Rocky Branch	0.0	5.0	2.0	0.5	50	114	5.24%	1.2	2.1	1.5	2.2	No	Yes
17	10+25-Y5RPB-LT 15+08-Y5RPB-LT	(2)Rocky Branch	0.0	6.0	4.0	1.0	100	483	0.12%	1.7	0.6	2.2	0.6	No	Yes
17	15+08-Y5RPB-LT 15+68-Y5RPB-LT	(2)Rocky Branch	0.0	6.0	4.0	0.1	10	60	0.83%	0.2	0.7	0.2	0.7	No	Yes
17	15+68-Y5RPB-LT 18+75-Y5RPB-LT	(2)Rocky Branch	0.0	6.1	4.0	0.6	60	307	0.42%	1.1	0.8	1.4	0.9	No	Yes
17	18+75-Y5RPB-LT 22+50-Y5RPB-LT	(2)Rocky Branch	0.0	6.2	4.0	1.7	170	375	1.50%	3.6	1.8	4.6	1.9	No	Yes
17	23+50-Y5RPC-RT 27+50-Y5RPC-RT	(2)Rocky Branch	0.0	6.0	4.2	0.7	70	400	1.65%	1.7	1.5	2.2	1.6	No	Yes
17	18+54-Y5RPD-LT 21+00-Y5RPD-LT	(2)Rocky Branch	0.0	2.0	3.0	0.1	10	246	3.84%	0.2	1.4	0.2	1.5	No	Yes
17	18+56-Y5RPD-RT 21+50-Y5RPD-RT	(2)Rocky Branch	0.0	6.0	4.8	0.3	30	294	4.04%	0.5	1.6	0.7	1.7	No	Yes
51	18+49-Y5A-RT 20+00-Y5A-RT	(2)Rocky Branch	0.0	4.0	2.0	0.6	60	200	1.85%	2.1	1.9	2.6	2.0	No	Yes
51	20+00-Y5A-RT 21+50-Y5A-RT	(2)Rocky Branch	0.0	4.0	2.0	0.3	30	150	1.87%	0.9	1.6	1.1	1.7	No	Yes
51	21+50-Y5A-RT 23+00-Y5A-RT	(2)Rocky Branch	0.0	4.0	2.0	0.3	30	150	0.87%	0.8	1.1	1.0	1.2	No	Yes
51	23+00-Y5A-RT 25+00-Y5A-RT	(2)Rocky Branch	0.0	4.0	2.0	0.3	30	151	0.40%	0.7	0.8	0.9	0.9	No	Yes
51	26+61-Y5A-RT 28+00-Y5A-RT	(2)Rocky Branch	0.0	4.1	2.0	1.3	130	139	2.44%	3.7	2.1	4.8	2.3	No	Yes
47	11+08-Y5E-RT 11+65-Y5E-RT	(2)Rocky Branch	0.0	4.0	2.0	0.2	20	57	8.65%	0.5	2.1	0.7	2.2	No	Yes
47	10+80-Y5C-LT 11+90-Y5C-LT	(2)Rocky Branch	0.0	4.0	3.0	0.3	30	110	4.22%	1.1	1.9	1.5	2.0	No	Yes
47	11+00-Y5C-RT 27+50-Y5-LT	(2)Rocky Branch	0.0	4.0	3.0	0.3	30	110	5.98%	0.5	1.6	0.7	1.7	No	Yes
20	12+50-Y5-LT 13+75-Y5-LT	(2)Rocky Branch	0.0	6.0	4.0	0.4	40	125	0.30%	0.7	0.7	0.9	0.7	No	Yes

Additional Comments

PERMIT DRAWING SHEET 5 OF 119

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

WBS Element: 37673.1.TA2 **TIP No.:** R-2721A **County(ies):** Wake

Swales

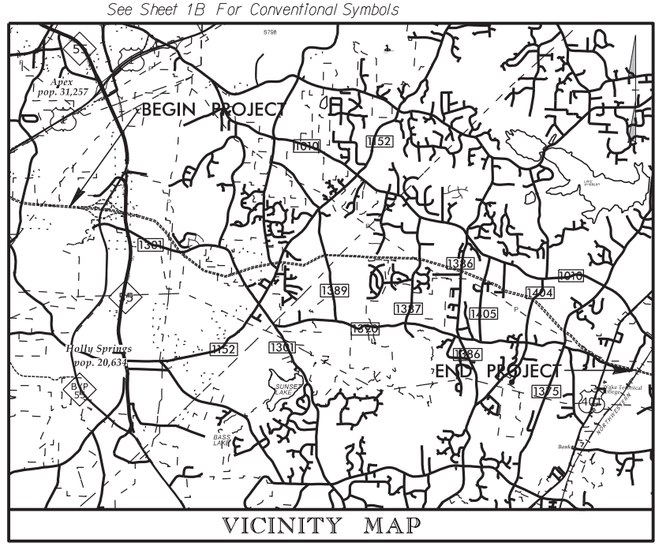
Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Base Width (ft)	Front Slope (H:1)	Back Slope (H:1)	Drainage Area (ac)	Recommended Treatm't Length (ft)	Actual Length (ft)	Longitudinal Slope (%)	Q2 (cfs)	V2 (fps)	Q10 (cfs)	V10 (fps)	Rock Checks Used	BMP Associated w/ Buffer Rules?
20	18+50-Y6-RT 19+50-Y6-RT	(2)Rocky Branch	0.0	6.0	4.0	1.1	110	200	1.70%	2.2	1.7	2.8	1.9	No	Yes
20	19+50-Y6-RT 21+50-Y6-RT	(2)Rocky Branch	0.0	6.0	2.8	0.7	70	100	0.71%	1.2	1.1	1.6	1.2	No	Yes

Additional Comments

09/08/99

PERMIT DRAWING SHEET 1 OF 119

See Sheet 1B For Conventional Symbols



STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

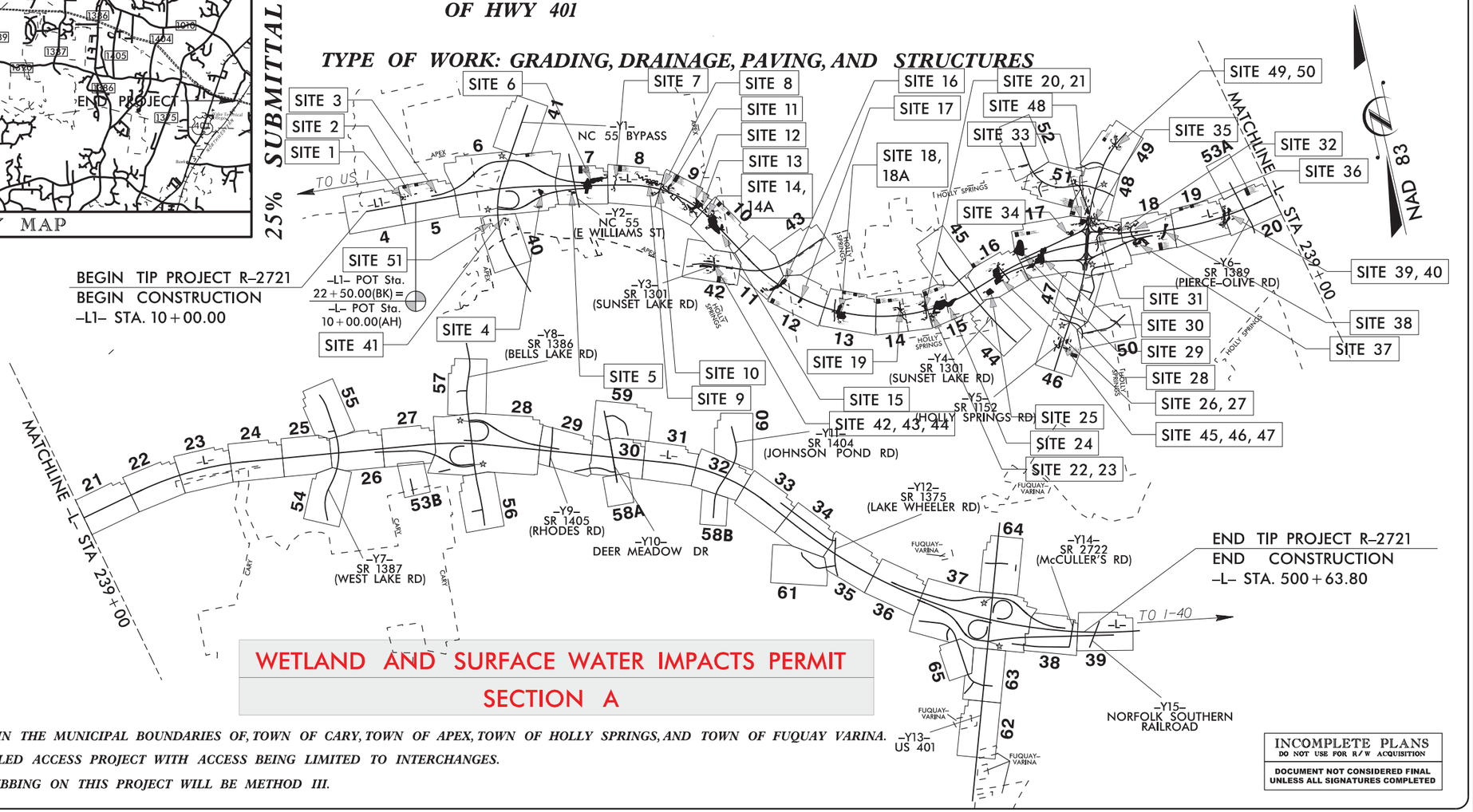
WAKE COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	R–2721	1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
6.401078	STP–540(19)	PE	

LOCATION: COMPLETE 540 – FROM WEST OF NC55 TO EAST OF HWY 401

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

25% SUBMITTAL



END TIP PROJECT R–2721
END CONSTRUCTION
–L– STA. 500+63.80

WETLAND AND SURFACE WATER IMPACTS PERMIT

SECTION A

THIS PROJECT WITHIN THE MUNICIPAL BOUNDARIES OF, TOWN OF CARY, TOWN OF APEX, TOWN OF HOLLY SPRINGS, AND TOWN OF FUQUAY VARINA.

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

CLEARING AND GRUBBING ON THIS PROJECT WILL BE METHOD III.

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TIP PROJECT: R–2721

CONTRACT:

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 2018 = 28,200
ADT 2040 = 66,400
K = 12 %
D = **65** %
T = 11 % *
V = 75 MPH
* TTST = 7% DUAL 4%

FUNC CLASS = INTERSTATE

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R–2721 =9.529 Miles
LENGTH STRUCTURES =0.178 Miles
TOTAL LENGTH TIP PROJECT R–2721 =9.351 Miles

Prepared In the Office of:

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
(919)571-7111
NC License Number F-0159

ECOLOGICAL ENGINEERING
NC FIRM LICENSE No: F-1148
1151 SE Cary Parkway
Suite 101
Cary, NC 27518
(919) 557-9929

SUNGATE DESIGN GROUP, P.A.
920 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-0243
NC FIRM LICENSE NO.: C-690

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
February 18, 2020

LETTING DATE:
February 18, 2020

Brian K. Eason, PE
PROJECT ENGINEER

Christina L. Yokeley, EI
PROJECT DESIGN ENGINEER

NCDOT CONTACT

HYDRAULICS ENGINEER

SIGNATURE: *P.E.*

ROADWAY DESIGN ENGINEER

SIGNATURE: *P.E.*

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

6/12/2018
R2721_Hyd_prm_wet_psh_01.dgn
jharvey

8/17/99

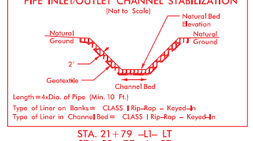
PERMIT DRAWING SHEET 2 OF 119

PROJECT REFERENCE NO.	SHEET NO.
R–2721	2A–1
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

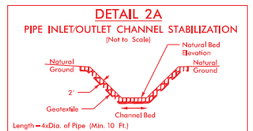
DETAIL 1A
PIPE INLET/OUTLET CHANNEL STABILIZATION
(Not to Scale)



Length = 4xDia. of Pipe (Min. 10 Ft.)
Type of Liner on Banks = CLASS I Rip–Rap – Keyed–In
Type of Liner in Channel Bed = CLASS I Rip–Rap – Keyed–In

STA. 21+79 –L1– LT
STA. 52+77 –L– RT
STA. 59+98 –L– LT
STA. 70+27 –L– RT
STA. 209+82 –L– RT
STA. 211+03 –L– LT
STA. 24+55 –Y5RPB– LT
STA. 19+96 –Y5RPC– RT

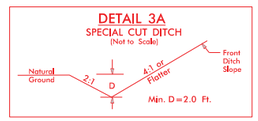
DETAIL 2A
PIPE INLET/OUTLET CHANNEL STABILIZATION
(Not to Scale)



Length = 4xDia. of Pipe (Min. 10 Ft.)
Type of Liner on Banks = CLASS II Rip–Rap – Keyed–In
Type of Liner in Channel Bed = CLASS I Rip–Rap – Keyed–In

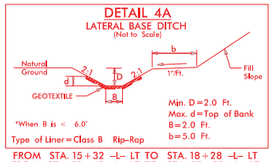
STA. 29+15 –Y1– LT

DETAIL 3A
SPECIAL CUT DITCH
(Not to Scale)



FROM STA. 185+00 –L– RT TO STA. 186+00 –L– RT
FROM STA. 232+00 –L– RT TO STA. 234+50 –L– RT
FROM STA. 68+36 –Y5– RT TO STA. 69+50 –Y5– RT
FROM STA. 70+34 –Y5– LT TO STA. 71+00 –Y5– LT
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. 14+75 –Y5F– LT TO STA. 17+00 –Y5F– LT
FROM STA. 18+00 –Y5F– RT TO STA. 19+30 –Y5F– RT
FROM STA. 18+50 –Y5F– LT TO STA. 19+21 –Y5F– LT
FROM STA. 21+00 –Y3DETR– LT TO STA. 22+00 –Y3DETR– LT

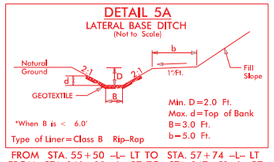
DETAIL 4A
LATERAL BASE DITCH
(Not to Scale)



Min. D=2.0 Ft.
Max. d=Top of Bank
B=2.0 Ft.
b=5.0 Ft.
*When B is < 6.0'
Type of Liner=Class B Rip–Rap

FROM STA. 15+32 –L– LT TO STA. 18+28 –L– LT
FROM STA. 50+42 –L– LT TO STA. 55+50 –L– LT
FROM STA. 77+00 –L– RT TO STA. 79+03 –L– RT
FROM STA. 148+32 –L– RT TO STA. 154+01 –L– RT
FROM STA. 204+38 –L– RT TO STA. 205+59 –L– RT
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. 50+50 –Y5– RT TO STA. 55+95 –Y5– RT
FROM STA. 66+61 –Y5– LT TO STA. 68+41 –Y5– LT
FROM STA. 68+60 –Y5– LT TO STA. 70+50 –Y5– LT
FROM STA. 18+93 –Y5NB– LT TO STA. 24+08 –Y5RPB– RT
FROM STA. 11+80 –Y5A– RT TO STA. 15+11 –Y5A– RT

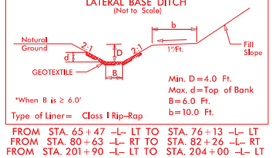
DETAIL 5A
LATERAL BASE DITCH
(Not to Scale)



Min. D=2.0 Ft.
Max. d=Top of Bank
B=3.0 Ft.
b=5.0 Ft.
*When B is < 6.0'
Type of Liner=Class B Rip–Rap

FROM STA. 55+50 –L– LT TO STA. 57+74 –L– LT
FROM STA. 146+00 –L– RT TO STA. 147+31 –L– RT

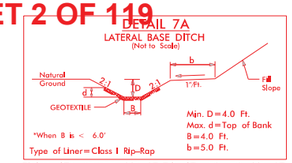
DETAIL 6A
LATERAL BASE DITCH
(Not to Scale)



Min. D=4.0 Ft.
Max. d=Top of Bank
B=6.0 Ft.
b=10.0 Ft.
*When B is ≥ 6.0'
Type of Liner= Class I Rip–Rap

FROM STA. 65+47 –L– LT TO STA. 76+13 –L– LT
FROM STA. 80+63 –L– RT TO STA. 82+26 –L– RT
FROM STA. 201+90 –L– LT TO STA. 204+00 –L– LT

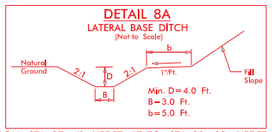
DETAIL 7A
LATERAL BASE DITCH
(Not to Scale)



Min. D=4.0 Ft.
Max. d=Top of Bank
B=4.0 Ft.
b=5.0 Ft.
*When B is < 6.0'
Type of Liner=Class I Rip–Rap

FROM STA. 47+75 –Y5– LT TO STA. 52+79 –Y5– LT

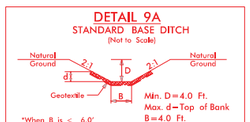
DETAIL 8A
LATERAL BASE DITCH
(Not to Scale)



Min. D=4.0 Ft.
B=3.0 Ft.
b=5.0 Ft.

FROM STA. 27+41 –Y5DET– LT TO STA. 32+82 –Y5DET– LT

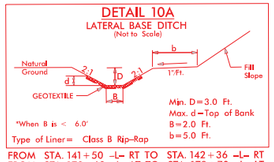
DETAIL 9A
STANDARD BASE DITCH
(Not to Scale)



Min. D=4.0 Ft.
Max. d=Top of Bank
B=4.0 Ft.
*When B is < 6.0'
Type of Liner= Class I Rip–Rap

FROM STA. 52+62 –Y5– LT TO STA. 54+98 –Y5– LT
FROM STA. 68+56 –Y5– LT TO STA. 69+50 –Y5– LT

DETAIL 10A
LATERAL BASE DITCH
(Not to Scale)

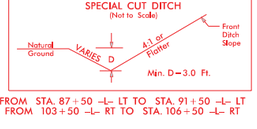


Min. D=3.0 Ft.
Max. d=Top of Bank
B=2.0 Ft.
b=5.0 Ft.
*When B is < 6.0'
Type of Liner= Class B Rip–Rap

FROM STA. 141+50 –L– RT TO STA. 142+36 –L– RT
FROM STA. 170+68 –L– LT TO STA. 173+70 –L– LT

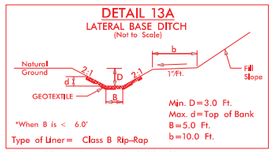
DETAIL HAS BEEN REMOVED

DETAIL 12A
SPECIAL CUT DITCH
(Not to Scale)



FROM STA. 87+50 –L– LT TO STA. 91+50 –L– LT
FROM 103+50 –L– RT TO STA. 106+50 –L– RT

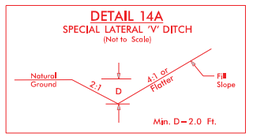
DETAIL 13A
LATERAL BASE DITCH
(Not to Scale)



Min. D=3.0 Ft.
Max. d=Top of Bank
B=5.0 Ft.
b=10.0 Ft.
*When B is < 6.0'
Type of Liner= Class B Rip–Rap

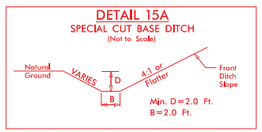
FROM STA. 196+50 –L– LT TO STA. 199+92 –L– LT

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



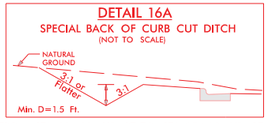
FROM STA. 13+51 –Y1LPB– LT TO STA. 15+00 –Y1LPB– LT
FROM STA. 18+88 –Y1RPC– LT TO STA. 19+85 –Y1RPC– LT
FROM STA. 19+50 –Y6– RT TO STA. 21+50 –Y6– RT
FROM STA. 18+50 –Y6– RT TO STA. 19+50 –Y6– RT

DETAIL 15A
SPECIAL CUT DITCH
(Not to Scale)



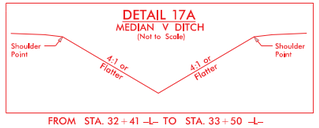
FROM STA. 225+50 –L– LT TO STA. 227+50 –L– LT
FROM STA. 227+50 –L– LT TO STA. 228+00 –L– LT

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



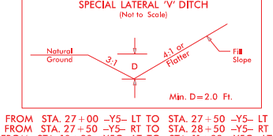
FROM STA. 23+30 –Y5– RT TO STA. 27+30 –Y5– RT
FROM STA. 31+70 –Y5– RT TO STA. 33+80 –Y5– RT
FROM STA. 11+00 –Y5I– LT TO STA. 13+51 –Y5I– LT
FROM STA. 14+00 –Y5I– LT TO STA. 10+66 –Y5J– LT
FROM STA. 10+66 –Y5J– LT TO STA. 15+50 –Y5J– LT

DETAIL 17A
MEDIAN 'V' DITCH
(Not to Scale)



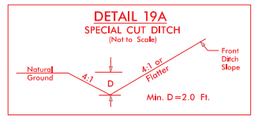
FROM STA. 32+41 –L– TO STA. 33+50 –L–

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



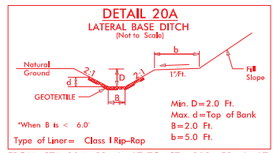
FROM STA. 27+00 –Y5– LT TO STA. 27+50 –Y5– LT
FROM STA. 27+50 –Y5– RT TO STA. 28+50 –Y5– RT
FROM STA. 10+80 –Y5C– LT TO STA. 11+89 –Y5C– LT
FROM STA. 11+00 –Y5C– RT TO STA. 27+50 –Y5– LT

DETAIL 19A
SPECIAL CUT DITCH
(Not to Scale)



FROM STA. 228+50 –L– LT TO STA. 230+50 –L– LT
FROM STA. 232+00 –L– RT TO STA. 234+50 –L– RT
FROM STA. 12+50 –Y6– LT TO STA. 13+75 –Y6– LT

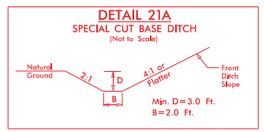
DETAIL 20A
LATERAL BASE DITCH
(Not to Scale)



Min. D=2.0 Ft.
Max. d=Top of Bank
B=2.0 Ft.
b=5.0 Ft.
*When B is < 6.0'
Type of Liner= Class I Rip–Rap

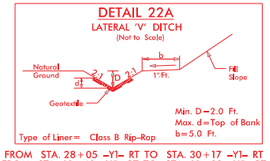
FROM STA. 204+32 –L– LT TO STA. 208+52 –L– LT
FROM STA. 204+38 –L– RT TO STA. 205+59 –L– RT
FROM STA. 209+73 –L– RT TO STA. 210+50 –L– RT
FROM STA. 15+84 –Y3– RT TO STA. 16+43 –Y3– RT
FROM STA. 24+00 –Y5RPB– LT TO STA. 24+54 –Y5RPB– LT
FROM STA. 23+86 –Y5RPD– RT TO STA. 25+12 –Y5RPD– RT

DETAIL 21A
SPECIAL CUT DITCH
(Not to Scale)



FROM STA. 154+00 –L– LT TO STA. 155+50 –L– LT
FROM STA. 155+50 –L– LT TO STA. 158+10 –L– LT
FROM STA. 160+50 –L– RT TO STA. 163+00 –L– RT

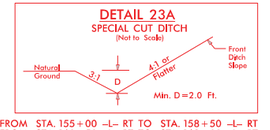
DETAIL 22A
LATERAL 'V' DITCH
(Not to Scale)



Min. D=2.0 Ft.
Max. d=Top of Bank
b=5.0 Ft.
Type of Liner= Class B Rip–Rap

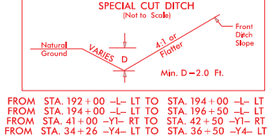
FROM STA. 28+05 –Y1– RT TO STA. 30+17 –Y1– RT
FROM STA. 68+40 –Y5– RT TO STA. 69+83 –Y5– RT
FROM STA. 69+05 –Y5– LT TO STA. 70+34 –Y5– LT

DETAIL 23A
SPECIAL CUT DITCH
(Not to Scale)



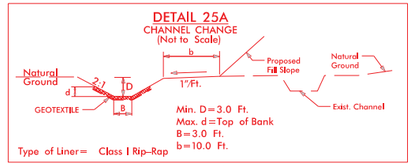
FROM STA. 155+00 –L– RT TO STA. 158+50 –L– RT
FROM STA. 160+50 –L– RT TO STA. 163+00 –L– RT
FROM STA. 14+00 –Y5G– RT TO STA. 14+33 –Y5G– RT
FROM STA. 14+00 –Y5G– LT TO STA. 14+44 –Y5G– LT

DETAIL 24A
SPECIAL CUT DITCH
(Not to Scale)



FROM STA. 192+00 –L– LT TO STA. 194+00 –L– LT
FROM STA. 194+00 –L– LT TO STA. 196+50 –L– LT
FROM STA. 41+00 –Y1– RT TO STA. 42+50 –Y1– RT
FROM STA. 34+26 –Y4– LT TO STA. 36+50 –Y4– LT

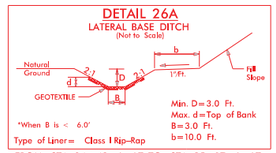
DETAIL 25A
CHANNEL CHANGE
(Not to Scale)



Min. D=3.0 Ft.
Max. d=Top of Bank
B=3.0 Ft.
b=10.0 Ft.
Type of Liner= Class I Rip–Rap

FROM STA. 83+25 –L– LT TO STA. 85+39 –L– LT

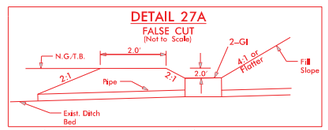
DETAIL 26A
LATERAL BASE DITCH
(Not to Scale)



Min. D=3.0 Ft.
Max. d=Top of Bank
B=3.0 Ft.
b=10.0 Ft.
*When B is < 6.0'
Type of Liner= Class I Rip–Rap

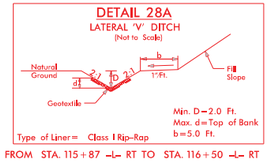
FROM STA. 84+48 –L– LT TO STA. 85+17 –L– LT

DETAIL 27A
FALSE CUT
(Not to Scale)



FROM STA. 226+02 –L– LT TO STA. 226+70 –L– LT
FROM STA. 227+28 –L– LT TO STA. 228+18 –L– LT
FROM STA. 41+25 –Y1– RT TO STA. 41+77 –Y1– RT
FROM STA. 24+50 –Y1RPB– RT TO STA. 26+50 –Y1RPB– RT
FROM STA. 27+00 –Y1RPB– RT TO STA. 28+50 –Y1RPB– RT

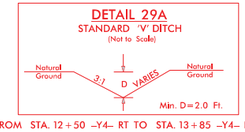
DETAIL 28A
LATERAL 'V' DITCH
(Not to Scale)



Min. D=2.0 Ft.
Max. d=Top of Bank
b=5.0 Ft.
Type of Liner= Class I Rip–Rap

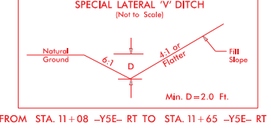
FROM STA. 115+87 –L– RT TO STA. 116+50 –L– RT

DETAIL 29A
STANDARD 'V' DITCH
(Not to Scale)



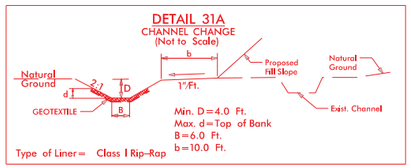
FROM STA. 12+50 –Y4– RT TO STA. 13+85 –Y4– RT

DETAIL 30A
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



FROM STA. 11+08 –Y5E– RT TO STA. 11+65 –Y5E– RT

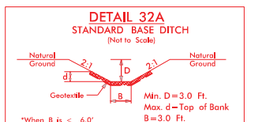
DETAIL 31A
CHANNEL CHANGE
(Not to Scale)



Min. D=4.0 Ft.
Max. d=Top of Bank
B=6.0 Ft.
b=10.0 Ft.
Type of Liner= Class I Rip–Rap

FROM STA. 65+47 –L– LT TO STA. 76+13 –L– LT
FROM STA. 80+75 –L– RT TO STA. 81+89 –L– RT

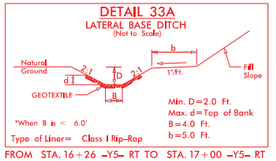
DETAIL 32A
STANDARD BASE DITCH
(Not to Scale)



Min. D=3.0 Ft.
Max. d=Top of Bank
B=3.0 Ft.
*When B is < 6.0'
Type of Liner= Class I Rip–Rap

FROM STA. 83+25 –L– LT TO STA. 84+48 –L– LT
FROM STA. 85+17 –L– LT TO STA. 85+39 –L– LT

DETAIL 33A
LATERAL BASE DITCH
(Not to Scale)



Min. D=2.0 Ft.
Max. d=Top of Bank
B=4.0 Ft.
b=5.0 Ft.
*When B is < 6.0'
Type of Liner= Class I Rip–Rap

FROM STA. 16+26 –Y5– RT TO STA. 17+00 –Y5– RT

DETAIL 34A
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



FROM STA. 24+00 –Y1RPB– RT TO STA. 29+50 –Y1RPB– RT

DETAIL HAS BEEN REMOVED

7/9/2018
R2721dgn_prm_wet_psh_02A1_Detail.dgn
bonvall

8/17/99

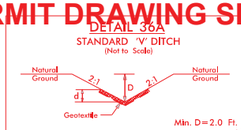
PERMIT DRAWING SHEET 3 OF 119

PROJECT REFERENCE NO.	SHEET NO.
R-2721	2A-2
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

DETAIL 36A
STANDARD 'V' DITCH
(Not to Scale)



Type of Liner= Class B Rip-Rap

FROM STA. 40+83 -L- LT TO STA. 43+50 -L- LT

DETAIL 41A
STANDARD BASE DITCH
(Not to Scale)



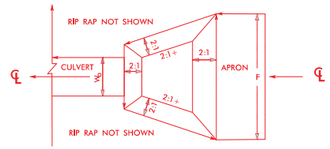
Type of Liner= Class II Rip-Rap

FROM STA. 10+11 -Y5RANB- RT TO STA. 13+06 -Y5RANB- RT

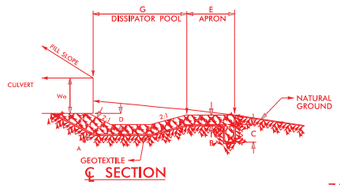
DETAIL 47A
RIP-RAPPED ENERGY DISSIPATOR BASIN

DIM. (ft)	RIP RAP BASIN # 1		
A	3.5		
B	2.3		
C	1.5		
D	1.1		
E	5.6		
F	13.6		
G	11.1		

ALL DIMENSIONS APPROXIMATE



PLAN



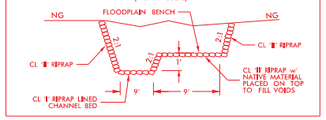
℄ SECTION

BASIN #	LOCATION (AT OUTLET)
1	15+17-Y5I-RT

7/08

STA. 15+17 -Y5I- RT

DETAIL 56A
INLET & OUTLET CHANNEL STABILIZATION
(Not To Scale)



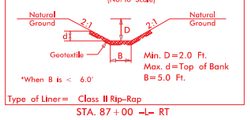
STA. 16+14 -Y5-

DETAIL 61A
SPECIAL CUT BASE DITCH
(Not to Scale)



FROM STA. 28+74 -Y3DETR- LT TO STA. 33+33 -Y3DETR- LT
FROM STA. 35+00 -Y3DETR- LT TO STA. 35+50 -Y3DETR- LT

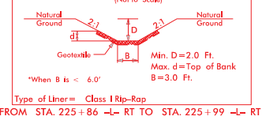
DETAIL 37A
STANDARD BASE DITCH
(Not to Scale)



Type of Liner= Class II Rip-Rap

STA. 87+00 -L- RT

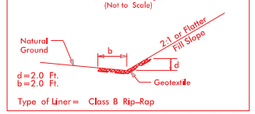
DETAIL 42A
STANDARD BASE DITCH
(Not to Scale)



Type of Liner= Class I Rip-Rap

FROM STA. 225+86 -L- RT TO STA. 225+99 -L- RT

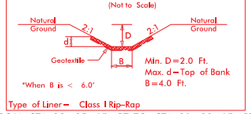
DETAIL 38A
TOE PROTECTION
(Not to Scale)



Type of Liner= Class B Rip-Rap

FROM STA. 48+92 -L- RT TO STA. 49+77 -L- RT
FROM STA. 52+30 -L- RT TO STA. 52+95 -L- RT
FROM STA. 58+10 -L- RT TO STA. 60+50 -L- RT
FROM STA. 68+00 -L- RT TO STA. 71+00 -L- RT
FROM STA. 79+95 -L- LT TO STA. 81+01 -L- LT
FROM STA. 81+24 -L- LT TO STA. 81+79 -L- LT
FROM STA. 75+65 -L- RT TO STA. 77+00 -L- RT
FROM STA. 85+66 -L- LT TO STA. 87+50 -L- LT
FROM STA. 86+62 -L- RT TO STA. 89+50 -L- RT
FROM STA. 115+53 -L- RT TO STA. 115+82 -L- RT
FROM STA. 124+67 -L- LT TO STA. 128+00 -L- LT
FROM STA. 126+06 -L- RT TO STA. 127+39 -L- RT
FROM STA. 139+80 -L- RT TO STA. 141+48 -L- RT
FROM STA. 141+19 -L- RT TO STA. 142+50 -L- RT
FROM STA. 145+24 -L- LT TO STA. 147+66 -L- LT
FROM STA. 150+00 -L- LT TO STA. 152+96 -L- LT
FROM STA. 166+00 -L- RT TO STA. 167+85 -L- RT
FROM STA. 166+60 -L- LT TO STA. 168+59 -L- LT
FROM STA. 211+06 -L- LT TO STA. 211+72 -L- LT
FROM STA. 225+14 -L- RT TO STA. 226+47 -L- RT
FROM STA. 226+16 -L- LT TO STA. 226+59 -L- LT
FROM STA. 227+39 -L- LT TO STA. 227+93 -L- LT
FROM STA. 12+00 -Y3- RT TO STA. 15+28 -Y3- RT
FROM STA. 13+66 -Y3- LT TO STA. 15+09 -Y3- LT
FROM STA. 16+33 -Y5- LT TO STA. 17+94 -Y5- LT
FROM STA. 17+26 -Y5- RT TO STA. 19+30 -Y5- RT
FROM STA. 18+00 -Y5F- RT TO STA. 19+30 -Y5F- RT
FROM STA. 11+70 -Y5RPBSB- LT TO STA. 12+45 -Y5RPBSB- LT
FROM STA. 18+40 -Y5RPC- RT TO STA. 20+18 -Y5RPC- RT
FROM STA. 13+18 -Y5RPD- LT TO STA. 15+20 -Y5RPD- LT

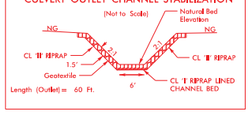
DETAIL 43A
STANDARD BASE DITCH
(Not to Scale)



Type of Liner= Class I Rip-Rap

FROM STA. 29+95 -Y1- RT TO STA. 30+23 -Y1- RT
FROM STA. 15+10 -Y5A- RT TO STA. 15+29 -Y5A- RT

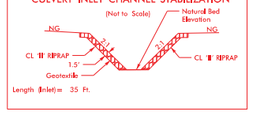
DETAIL 48A
CULVERT OUTLET CHANNEL STABILIZATION
(Not to Scale)



Length (Outlet)= 60 Ft.

STA. 79+00 -L- RT

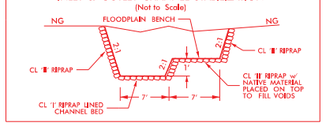
DETAIL 52A
CULVERT INLET CHANNEL STABILIZATION
(Not to Scale)



Length (Inlet)= 35 Ft.

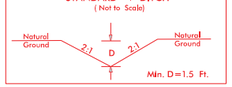
STA. 18+65 -L1-

DETAIL 57A
INLET & OUTLET CHANNEL STABILIZATION
(Not to Scale)



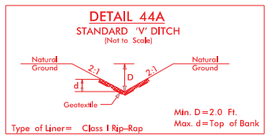
STA. 68+38 -Y5-

DETAIL 62A
STANDARD 'V' DITCH
(Not to Scale)



FROM STA. 43+50 -Y5DET- RT TO STA. 44+20 -Y5DET- RT

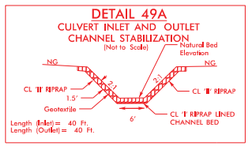
DETAIL 44A
STANDARD 'V' DITCH
(Not to Scale)



Type of Liner= Class I Rip-Rap

FROM STA. 227+46 -L- LT TO STA. 227+50 -L- LT

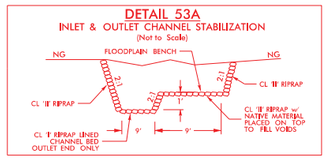
DETAIL 49A
CULVERT INLET AND OUTLET CHANNEL STABILIZATION
(Not to Scale)



Length (Inlet)= 40 Ft.
Length (Outlet)= 40 Ft.

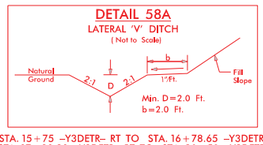
STA. 125+86 -L-

DETAIL 53A
INLET & OUTLET CHANNEL STABILIZATION
(Not to Scale)



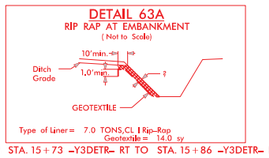
STA. 169+00 -L-

DETAIL 58A
LATERAL 'V' DITCH
(Not to Scale)



FROM STA. 15+75 -Y3DETR- RT TO STA. 16+78.65 -Y3DETR- RT
FROM STA. 17+39.39 -Y3DETR- RT TO STA. 20+50 -Y3DETR- RT
FROM STA. 17+50 -Y6DET- RT TO STA. 18+03 -Y6DET- RT
FROM STA. 18+03 -Y6DET- RT TO STA. 18+50 -Y6DET- RT

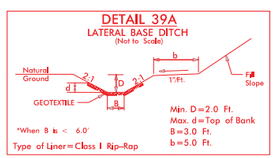
DETAIL 63A
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner= 7.0 TONS,CL I Rip-Rap
Geotextile= 14.0 sy

FROM STA. 15+73 -Y3DETR- RT TO STA. 15+86 -Y3DETR- RT

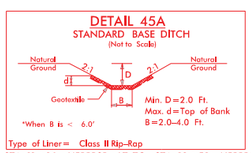
DETAIL 39A
LATERAL BASE DITCH
(Not to Scale)



Type of Liner= Class I Rip-Rap

FROM STA. 55+50 -L- LT TO STA. 57+74 -L- LT

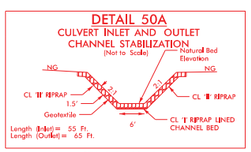
DETAIL 45A
STANDARD BASE DITCH
(Not to Scale)



Type of Liner= Class II Rip-Rap

FROM STA. 11+20 -Y5RPBSB- LT TO STA. 12+52 -Y5RPBSB- LT

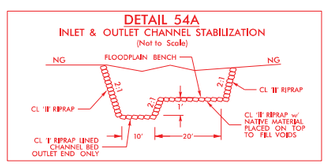
DETAIL 50A
CULVERT INLET AND OUTLET CHANNEL STABILIZATION
(Not to Scale)



Length (Inlet)= 55 Ft.
Length (Outlet)= 65 Ft.

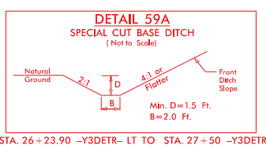
STA. 141+68 -L-

DETAIL 54A
INLET & OUTLET CHANNEL STABILIZATION
(Not to Scale)



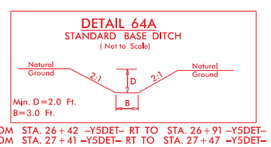
STA. 205+00 -L-

DETAIL 59A
SPECIAL CUT BASE DITCH
(Not to Scale)



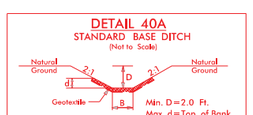
FROM STA. 26+23.90 -Y3DETR- LT TO STA. 27+50 -Y3DETR- LT

DETAIL 64A
STANDARD BASE DITCH
(Not to Scale)



FROM STA. 26+42 -Y5DET- RT TO STA. 26+91 -Y5DET- RT
FROM STA. 27+41 -Y5DET- RT TO STA. 27+47 -Y5DET- RT

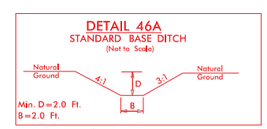
DETAIL 40A
STANDARD BASE DITCH
(Not to Scale)



Type of Liner= Class I Rip-Rap

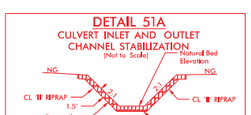
FROM STA. 148+22 -L- RT TO STA. 148+37 -L- RT
FROM STA. 150+74 -L- LT TO STA. 150+93 -L- LT
FROM STA. 226+29 -L- LT TO STA. 226+38 -L- LT

DETAIL 46A
STANDARD BASE DITCH
(Not to Scale)



FROM STA. 21+86 -Y5J- LT TO STA. 22+24 -Y5J- LT

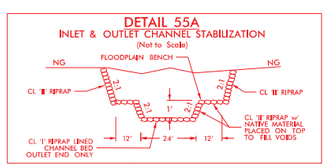
DETAIL 51A
CULVERT INLET AND OUTLET CHANNEL STABILIZATION
(Not to Scale)



Length (Inlet)= 45 Ft.
Length (Outlet)= 45 Ft.

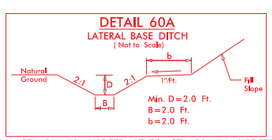
STA. 147+58 -L-

DETAIL 55A
INLET & OUTLET CHANNEL STABILIZATION
(Not to Scale)



STA. 15+55 -Y3-

DETAIL 60A
LATERAL BASE DITCH
(Not to Scale)



FROM STA. 27+50 -Y3DETR- LT TO STA. 28+74 -Y3DETR- LT
FROM STA. 33+33 -Y3DETR- LT TO STA. 35+00 -Y3DETR- LT

7/9/2018
R2721_Std_prm_wet_psh_02A2_Detail.dgn
jhargett

51499

PERMIT DRAWING SHEET 4 OF 119

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 NC FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
R-2721	2B-1
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT REMOVAL
PAVED SHOULDER

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

Sta. =15+76 -Y3DETR- RT
Q(10) = 6.0 CFS
V(10) = 2.38 FPS
d(10) = 1.12 Ft.
s = 1.03%
n = 0.040
Liner = Grass

Sta. =21+00 -Y3DETR- LT
Q(10) = 6.0 CFS
V(10) = 4.18 FPS
d(10) = 0.76 Ft.
s = 5.12%
n = 0.040
Liner = Grass

-Y3DETR- PRC Sta. 12+58.95
WETLAND WS

-Y3DETR- PT Sta. 17+05.64
WETLAND WR

-Y3DETR- EC Sta. 10+05.05

-Y3DETR- POT Sta. 10+00.00

SITE 1

SITE 2

MATCHLINE SHEET 2B-2 -Y3DET- STA 22+00.00

MATCHLINE SHEET 2B-1 -Y3- STA 21+75.00

BEGIN CONSTRUCTION -Y3DETR- STA. 10+05.05

SEE SHEET 121 FOR -Y3DET- PROFILE
SEE SHEETS 11, 42, & 43 FOR -Y3- PLAN VIEW
SEE SHEETS 101 & 102 FOR -Y3- PROFILE

7/9/2018
R-2721_hyd_prm_wet_psh_02B1.dgn
jlhorney

PERMIT DRAWING SHEET 5 OF 119

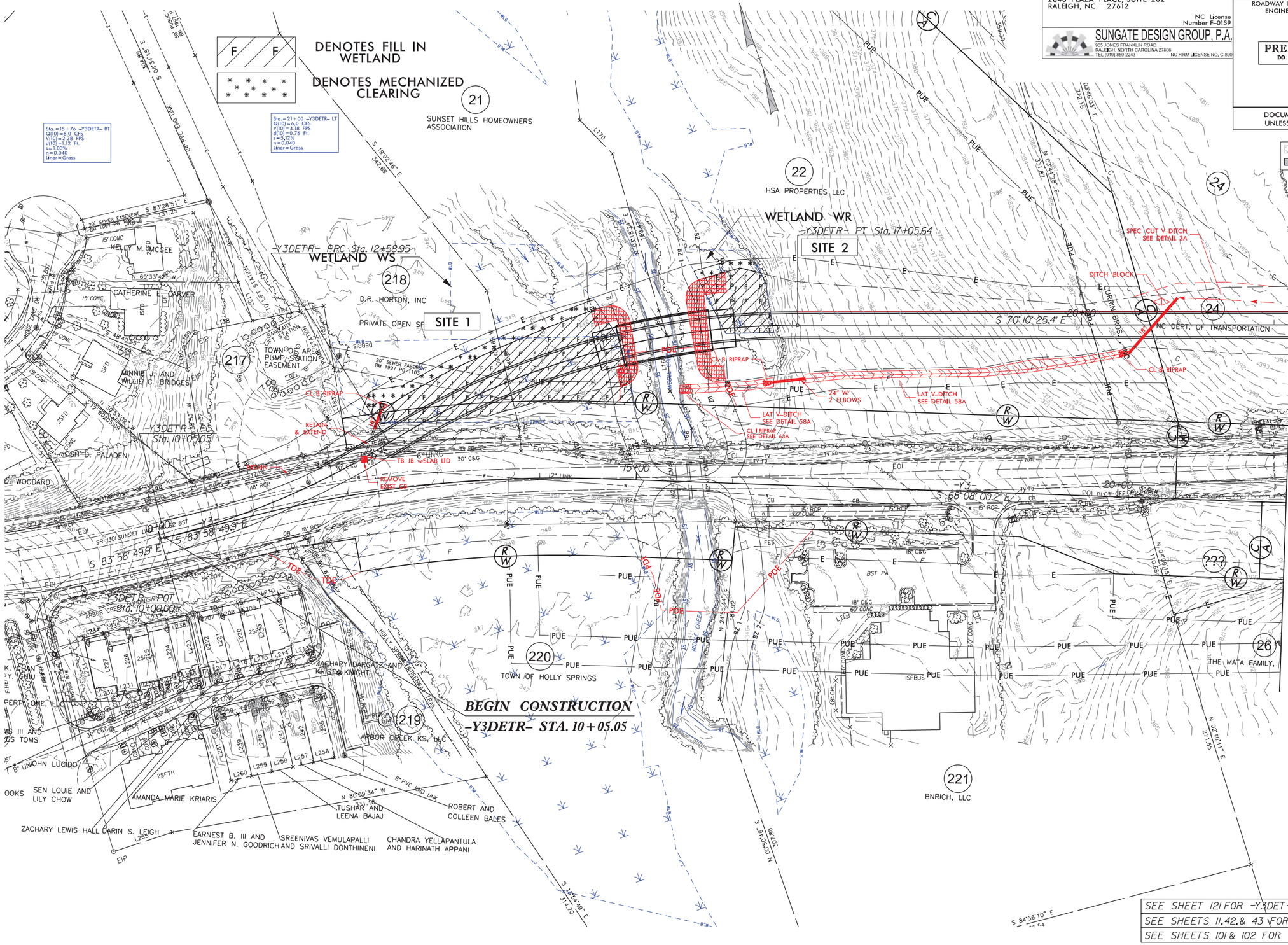
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 NC FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
R-2721	2B-1
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



SEE SHEET 121 FOR -Y3DET- PROFILE
SEE SHEETS 11, 42, & 43 FOR -Y3- PLAN VIEW
SEE SHEETS 101 & 102 FOR -Y3- PROFILE

51499

7/9/2018
R2721_Hyd_prm_wet_psh_0281a.dgn
jharvey

PERMIT DRAWING SHEET 6 OF 119

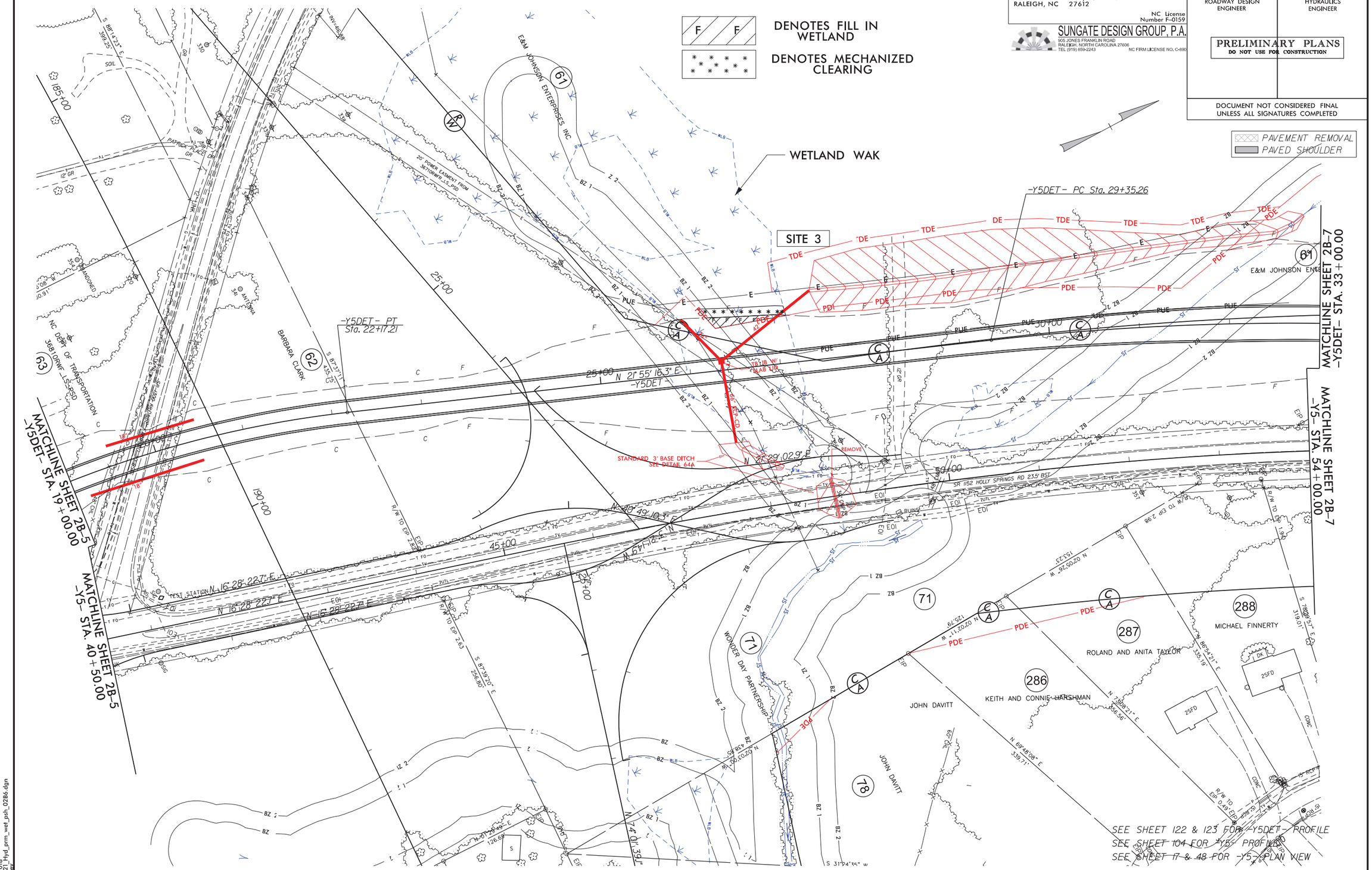
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
NC FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
R-2721	2B-6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



51499

7/9/2018
R2721_Hyd_prm_wet_psh_0286.dgn
jbarvey

PERMIT DRAWING SHEET 7 OF 119

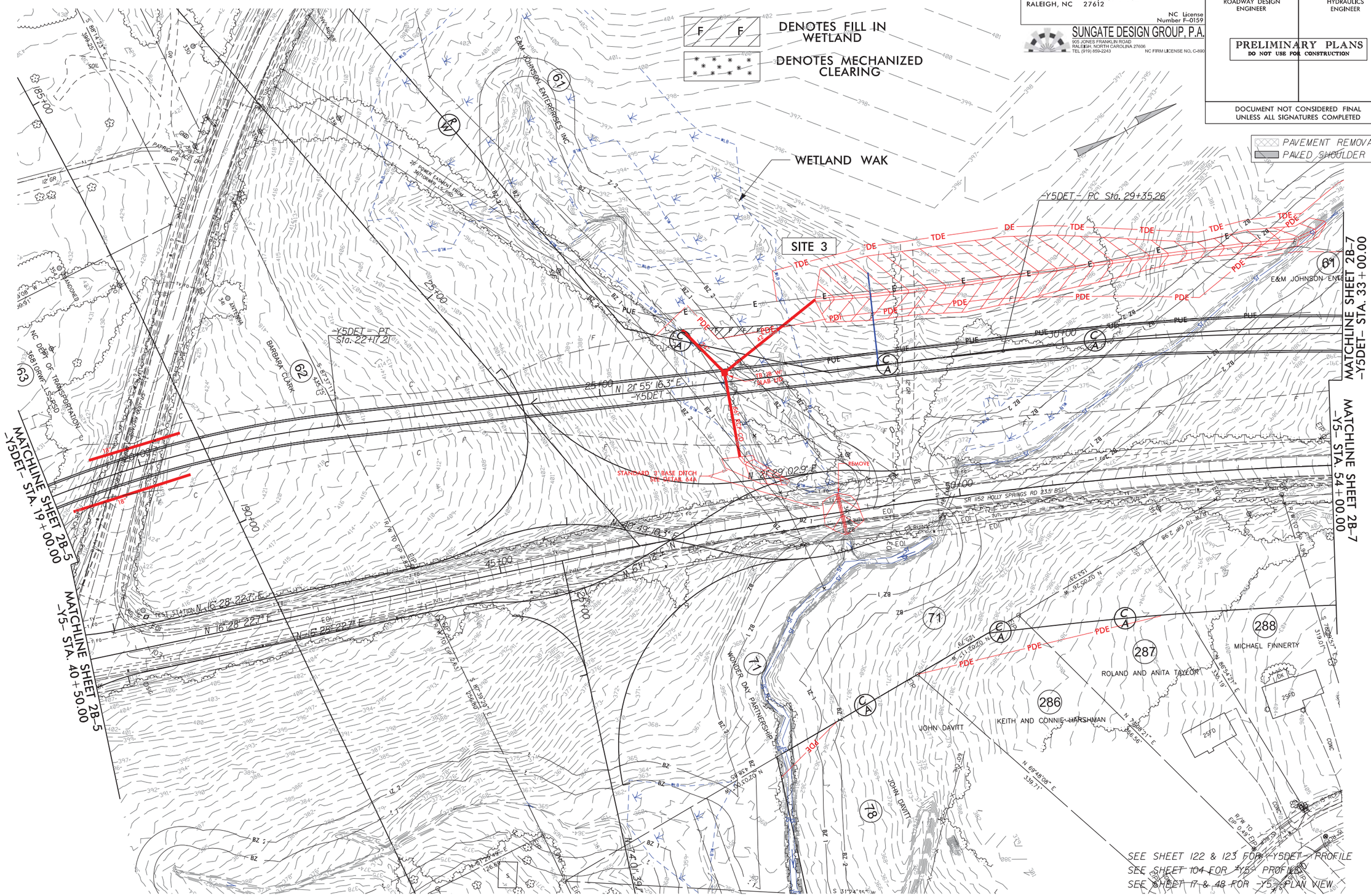
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
NC FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
R-2721	2B-6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



51499

7/9/2018
R2721_Hyd_prm_wet_psh_02B6a.dgn
jbarvey

51499

PERMIT DRAWING SHEET 8 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'

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 NC FIRM LICENSE NO. C-890

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

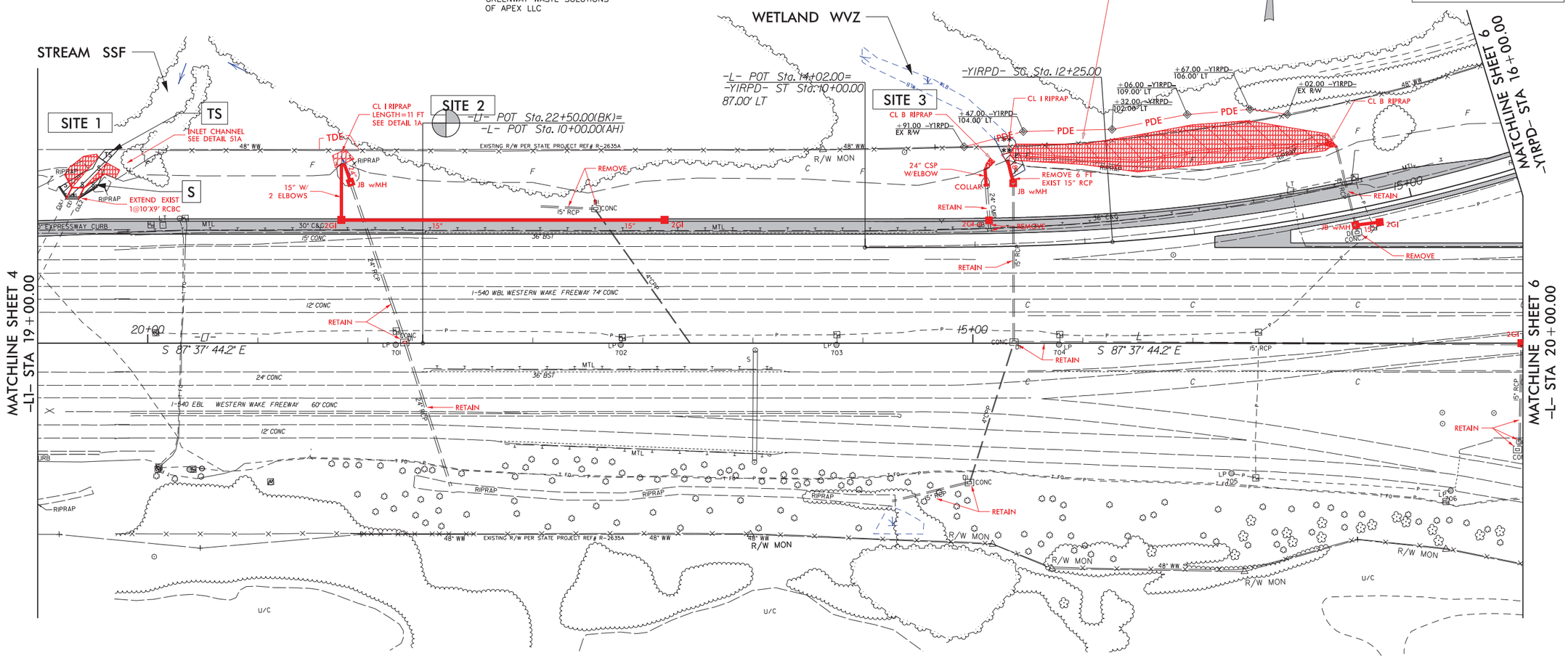
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83

PAVEMENT REMOVAL
PAVED SHOULDER

409
GREENWAY WASTE SOLUTIONS OF APEX LLC



GREENWAY WASTE SOLUTIONS OF APEX LLC

SEE SHEET 66 FOR -L- PROFILE
SEE SHEET 66 FOR -LI- PROFILE
SEE SHEET 88 FOR -YIRPD- PROFILE

7/2/2018
R2721_Hyd_prm_wet_psh_05.dgn
lhorney

PERMIT DRAWING SHEET 9 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'

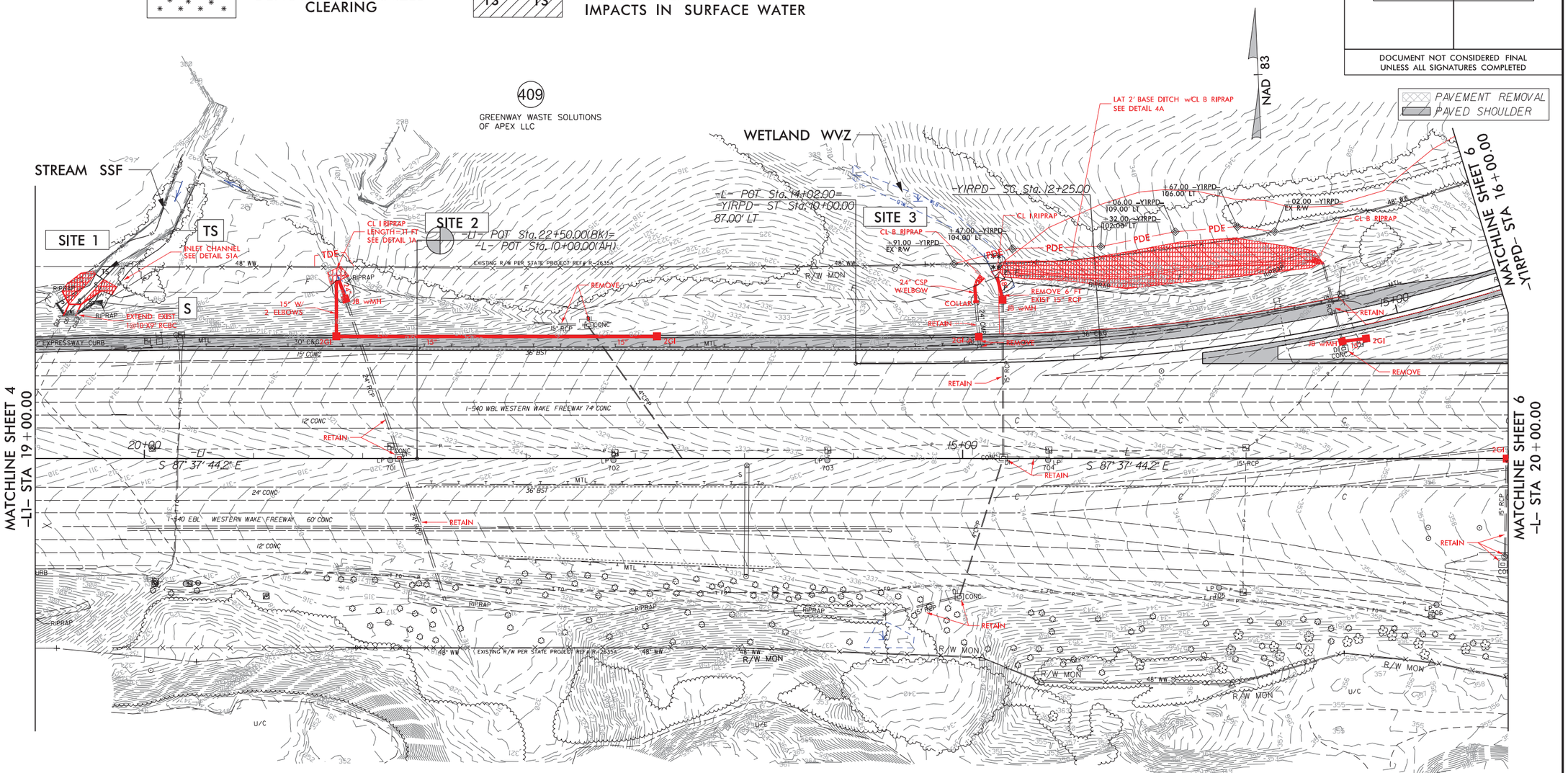
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 NC FIRM LICENSE NO. C-890

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



SEE SHEET 66 FOR -L- PROFILE
SEE SHEET 66 FOR -L1- PROFILE
SEE SHEET 88 FOR -YIRPD- PROFILE

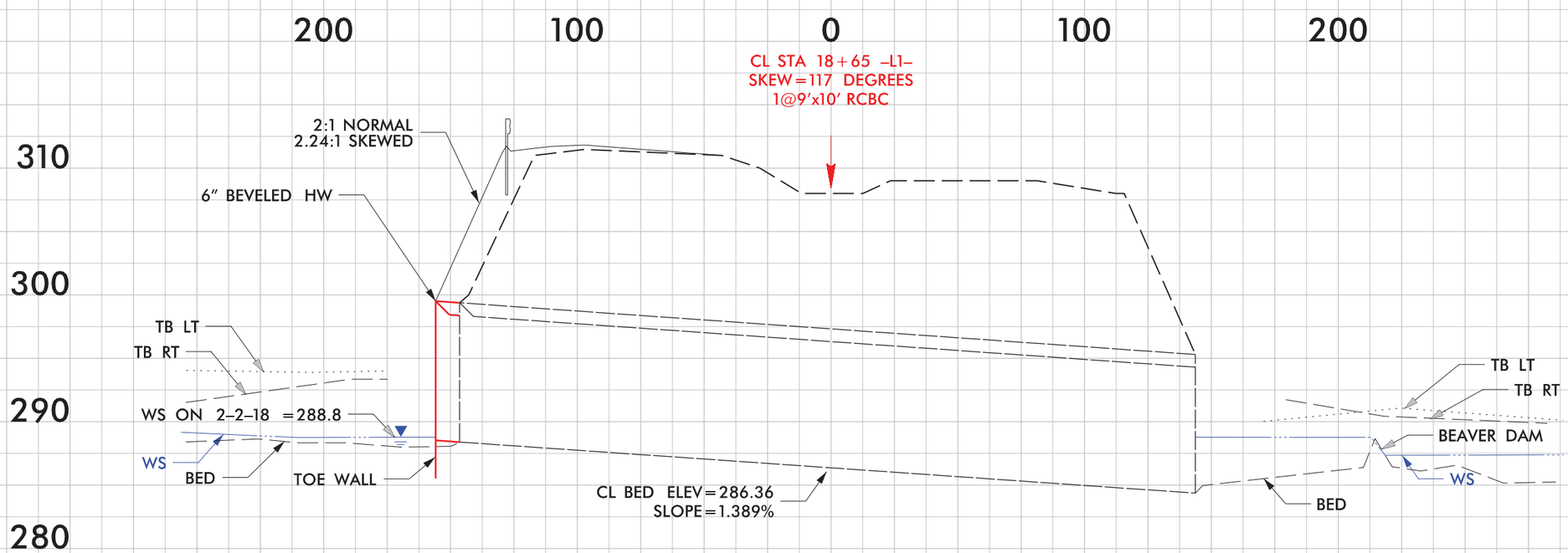
7/9/2018
R2721_Hyd_prm_wet_psh_05a.dgn
jharvey

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



5/14/99

7/9/2018
R2721_Hyd_prm_wet_psh_05b_sec.dgn
jbarvey

PERMIT DRAWING SHEET 11 OF 119

REVISIONS

NC 55 BYPASS
35,400
60,800
600 6,900 | 4,500 10,300 | COMPLETE 540 17,500 49,300
26,800 66,400 | WESTERN WAKE FREEWAY | 14,900 31,300 | 3,300 10,800
46,600 105,700
NC 55 BYPASS
2018 ADT
2040 ADT

DENOTES FILL IN WETLAND
DENOTES IMPACTS IN SURFACE WATER (POND)

LOCHNER
H. W. LOCHNER, INC.
7644 FALLS POINTE, SUITE 202
RALEIGH, NC 27615
NC License Number P-0253
SUNGATE DESIGN GROUP, P.A.

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MATCHLINE SHEET 41
-Y1- STA 47+00.00

-Y1- POT Sta.44+89.8=
-YIRPC- POT Sta. 31+05.56
Δ = 68°09'18.2"

-YIRPD- PT Sta. 29+14.73

-YIRPD- SC Sta. 24+97.93

-YIRPD- SRS Sta. 22+17.93

-YIRPD- CS Sta. 19+92.93

-Y1- POT Sta.44+76.5=
-YIRPD- POT Sta. 31+70.24
Δ = 68°09'18.2"

-L1 POC Sta. 31+10.55=
-Y1- POT Sta. 37+56.06
Δ = 68°07'02.6"

-YIRPC- PC Sta. 30+33.56

-YIRPC- SC Sta. 27+99.33

-YIRPC- TS Sta. 24+99.33

-YIRPC- ST Sta. 22+99.33

-YIRPC- CS Sta. 20+94.33

-YIRPC- SRS Sta. 17+90.33

-YIRPD- POT Sta. 37+10.24
Δ = 9°10'24"

-L- POC Sta. 32+50.57=
-YILPB- ST Sta. 0+00.00
75.000 RT

-YILPB- SC Sta. 12+00.00

-YILPB- ST Sta. 19+22.71

-YILPB- CS Sta. 17+22.71

-YILPB- PT Sta. 31+55.55

-YIRPB- SRS Sta. 26+07.72

-YIRPB- SC Sta. 29+12.72

-YIRPB- ST Sta. 32+35.62

-YIRPB- CS Sta. 20+28.50

-YIRPB- CS Sta. 23+37.72

-L- PC Sta. 22+53.85

-L- POC Sta. 32+40.00=
-Y1- POT Sta. 34+40.59
Δ = 92°44'42.5"

-L- POC Sta. 32+40.00=
-YILPB- POT Sta. 32+40.00
Δ = 91°10'2.4"

MATCHLINE SHEET 40
-Y1- STA 31+00.00

MATCHLINE SHEET 5
-L- STA 20+00.00

MATCHLINE SHEET 7
-L- STA 45+00.00

-YIRPD- STA 16+00.00

-YIRPC- STA 17+00.00

SEE PSH 06B

WETLAND WE
SITE 4

POND PA

HOPE COMMUNITY CHURCH OF NC, INC

NC TURNPIKE AUTHORITY

GEORGE WILLIAMS & JULIA PULLEN HUGHES

VICTOR B. JAMMAL & TERESA B. MORENO CDE

JOHN E. & JACQUELINE Y. BROWN

NO WETLAND IMPACT

SEE SHEET 2B-25 FOR BRIDGE SKETCH

SEE SHEET 67 FOR -L- PROFILE
SEE SHEET 88 FOR -YIRPD- PROFILE
SEE SHEET 86 FOR -YIRPB- PROFILE
SEE SHEET 87 FOR -YIRPC- PROFILE
SEE SHEET 88 FOR -YILPB- PROFILE

PROPOSED SIGNAL
PAVED SHOULDER
PAVEMENT REMOVAL

GRAPHIC SCALE
50 25 0 50 100
PLANS

LOCATION:

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

PERMIT DRAWING SHEET 12 OF 119

REVISIONS

NC 55 BYPASS
35,400 / 60,800
600 / 6,900 | 4,500 / 10,300 | COMPLETE 540 17,500 / 49,300
26,800 / 66,400 | 14,900 / 31,300 | 3,300 / 10,800
WESTERN WAKE FREEWAY
46,600 / 105,700
NC 55 BYPASS
2018 ADT / 2040 ADT

DENOTES FILL IN WETLAND
DENOTES IMPACTS IN SURFACE WATER (POND)

MATCHLINE SHEET 41 -Y1- STA 47+00.00
MATCHLINE SHEET 5 -L- STA 20+00.00
MATCHLINE SHEET 40 -Y1- STA 31+00.00
MATCHLINE SHEET 7 -L- STA 45+00.00
-YIRPB- STA 14+00.00
-YIRPC- STA 17+00.00
-YIRPD- STA 16+00.00

SEE PSH 06B

WETLAND WE SITE 4
POND PA
NO WETLAND IMPACT

SEE SHEET 6F FOR -L- PROFILE
SEE SHEET 9B FOR -YIRPD- PROFILE
SEE SHEET 8G FOR -YIRPB- PROFILE
SEE SHEET 8F FOR -YIRPC- PROFILE
SEE SHEET 8B FOR -YILPB- PROFILE
SEE SHEET 2B-25 FOR BRIDGE SKETCH

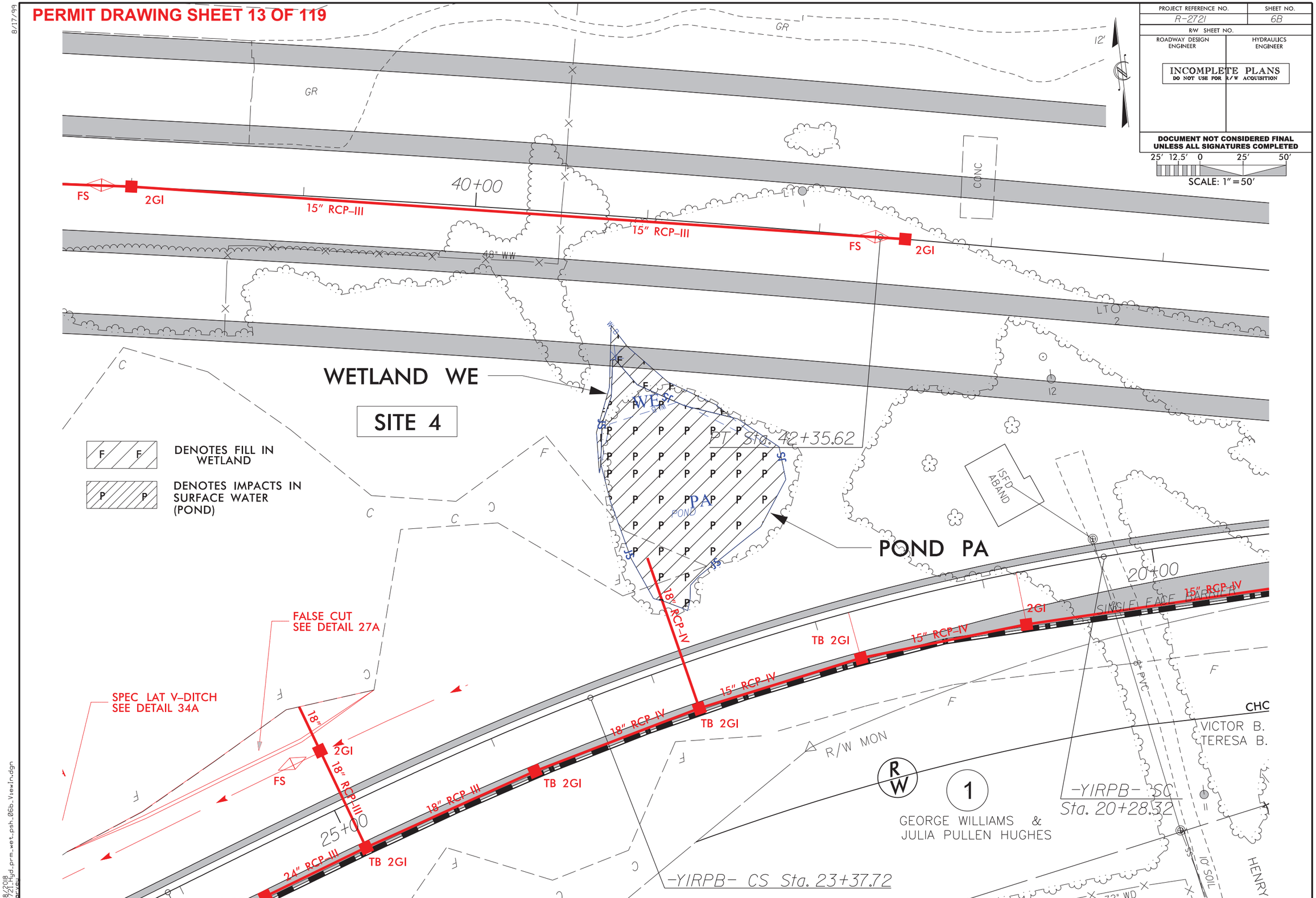
PROPOSED SIGNAL
PAVED SHOULDER
PAVEMENT REMOVAL

GRAPHIC SCALE
50 25 0 50 100
PLANS

LOCHNER
H. W. LOCHNER, INC.
7345 POLO PLACE, SUITE 202
RALEIGH, NC 27615
NC License Number P-0933
SUNGATE DESIGN GROUP, P.A.

PROJECT REFERENCE NO. R-2721
SHEET NO. 6
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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


PERMIT DRAWING SHEET 13 OF 119
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
25' 12.5' 0 25' 50'
SCALE: 1" = 50'
GR
12'
40+00
FS
2GI
15" RCP-III
48" WW
CONC
LT 1
LT 2
WETLAND WE
SITE 4
DENOTES FILL IN WETLAND
DENOTES IMPACTS IN SURFACE WATER (POND)
PT Sta. 42+35.62
WE
PA
POND
POND PA
ISFD ABAND
20+00
SINGLE FACE BARRIER
15" RCP-IV
2GI
TB 2GI
18" RCP-IV
FALSE CUT SEE DETAIL 27A
SPEC LAT V-DITCH SEE DETAIL 34A
18"
18" RCP-III
24" RCP-III
25+00
R/W MON
CHC
VICTOR B.
TERESA B.
R W
1
GEORGE WILLIAMS & JULIA PULLEN HUGHES
-YIRPB- SC Sta. 20+28.32
-YIRPB- CS Sta. 23+37.72
72" WD
10' SOIL
HENRY
8" PVC
8/17/99
7/8/2018
R2721_Hyd_prm_wet_psh_06b_ViewIn.dgn

6/23/16

PERMIT DRAWING SHEET 14 OF 119

0 5 10

PROJ. REFERENCE NO.	SHEET NO.
R-2721	X-317

10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290

430 420 410 400 390 380

WETLAND WETLAND

FILL IN WETLAND *(WE)*

IMPACTS IN SURFACE WATER POND

6.693:1 0.020 0.020 4.29:1 4.6:1

412.96 406.22 395.97

41+50.00

WETLAND WETLAND

FILL IN WETLAND *(WE)*

IMPACTS IN SURFACE WATER POND

6.208:1 0.020 0.020 4.33:1

411.95 399.75

41+00.00

SITE 4

5.738:1 0.020 0.020 5.21:1

410.86 399.61

40+50.00

—L— RT

7/8/2018
R2721_Hyd-prm_wet_psh_06c_xpl.dgn
jharvey

PERMIT DRAWING SHEET 15 OF 119

51499

50′ 25′ 0 50′ 100′
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

PAVEMENT REMOVAL
PAVED SHOULDER

NAD 83

MATCHLINE SHEET 6
-L- STA 45+00.00

MATCHLINE SHEET 8
-L- STA 58+00.00

-YIRPB- STA 14+00.00

-YIRPC- STA 17+00.00

3 NC TURNPIKE AUTHORITY

5 PAULINE PENNINGTON

-Y2- POC Sta.16+50.78=
-YIRPC- POC Sta.13+75.76
Δ 107°05' 36.70"

6 MAINER T & UVA R. HOLLAND

7 MAINER T & UVA R. HOLLAND

2 MAINER T & UVA R. HOLLAND

12 MCI ENTERPRISES, LLC

13 WORD OF TRUTH CHURCH OF GOD

16 MCI ENTERPRISES, LLC

MCI ENTERPRISES, LLC

STREAM SF

14 NCDOT

15 BESSIE H. JONES

11 HARVEY L. MONTAGUE

8 IGNACIO RODRIGUEZ IBARRA

10 THOROUGHFARE BUFFER BM 2000 PG 1820

9 WETLAND WG
DARRIN F. MCCLAIN (PER GIS)
HEIR OF HENRY E. MCCLAIN

LORENE DOBBS

PEGGY S. CANNADY

DAVID C. AND TERENA R. ROBINSON

EDWARD C. AND PATRICIA D. KILEY

SITE 6

SITE 5

WETLAND WF

-L- POT Sta.53+33.40
-YIRPC- ST Sta.10+00.00
75.00' LT

-Y2- PT Sta.16+71.59

-YIRPC- SC Sta.12+05.00

-Y2- PC Sta.15+95.96

-L- POT Sta.49+75.34=
-Y2- POT Sta.15+56.34
Δ = 79°27' 37.04"

-Y2- PT Sta.13+64.88

-YIRPB- SC Sta.12+00.00

-L- POT Sta.54+01.62
-YIRPB- ST Sta.10+00.00
75.00' RT

-Y2- PC Sta.11+18.81
N 1° 24' 41.7" W

-YIRPB- OS Sta.18+28.32

N 1° 17' 37.0" E

S 78° 10' 00.1" E

TOE PROTECTION SEE DETAIL 38A

LAT 3' BASE DITCH w/CL RIPRAP SEE DETAIL 29A

CL RIPRAP LENGTH=16 FT SEE DETAIL 1A

RETAIN

15" RCP-III
15" RCP-IV
18" RCP-III
2GI
TB 2GI
FS
MCF
PDE
PUE
SSA
BZ 1
BZ 2

SEE SHEET 87 FOR -YIRPC- PROFILE
SEE SHEET 86 FOR -YIRPB- PROFILE
SEE SHEET 2B-25 FOR BRIDGE SKETCH
SEE SHEET 68 FOR -L- PROFILE

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 NC FIRM LICENSE NO. C-890

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

7/8/2018
R2721_Hyd_prm_wet_psh_07.dgn
jbarrow

51499

PERMIT DRAWING SHEET 16 OF 119

50′ 25′ 0 50′ 100′
SCALE: 1″ = 100′

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 NC FIRM LICENSE NO. C-890

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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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

PAVEMENT REMOVAL
PAVED SHOULDER

NAD 83

END CONSTRUCTION
-Y2- STA. 19+75.00

-Y2- POC Sta.16+50.78=
-YIRPC- POC Sta.13+75.76
Δ 107°05' 36.70"

-Y2- PT Sta.16+71.59
-YIRPC- SC Sta.12+05.00
-L- POT Sta.53+33.40
-YIRPC- ST Sta.10+00.00
75.00' LT

-Y2- PC Sta.15+95.96
-L- POT Sta.49+75.34=
-Y2- POT Sta.15+56.54
Δ 79°27' 37.04"

-Y2- PT Sta.13+54.88
-YIRPB- SC Sta.12+00.00
-L- POT Sta.54+01.62
-YIRPB- ST Sta.10+00.00
75.00' RT

-Y2- PC Sta.11+18.81
N 1° 24' 41.7" W

-YIRPB- Sta.18+28.32

BEGIN CONSTRUCTION
-Y2- STA. 13+72.00

-YIRPC- STA 17+00.00
-YIRPB- STA 14+00.00

MATCHLINE SHEET 6
-L- STA 45+00.00

MATCHLINE SHEET 8
-L- STA 58+00.00

STREAM SF

SITE 5
SITE 6

WETLAND WF
WETLAND WG

NC TURNPIKE AUTHORITY
PAULINE PENNINGTON
MAINER T & UVA R. HOLLAND
LORENE DOBBS
BRENDA W. BIALOCK KEOPPEN
PEGGY S. CANNADY
HARVEY L. MONTAGUE
IGNACIO RODRIGUEZ IBARRA
MCI ENTERPRISES, LLC
WORD OF TRUTH CHURCH OF GOD
DARRIN F. MCCLAIN (PER GIS) HEIR OF HENRY E. MCCLAIN
NCDOT
BESSIE H. JONES
EDWARD C. AND PATRICIA D. KILEY
DAVID C. AND VERENA R. ROBINSON
SUSAN E. CATCHINGS

NC 55 E WILLIAMS ST

LAT 3' BASE DITCH w/CL I RIPRAP SEE DETAIL 19A
TOE PROTECTION SEE DETAIL 38A
CL I RIPRAP LENGTH=16 FT SEE DETAIL 1A
SINGLE FACE BARRIER
15" RCP-III
15" RCP-IV
2GI
TB 2GI
FS
MCF
ISFD
DK
RETAIN
ACCESS EASEMENT PER DB 2000 PG 1820
AT&T FIBER INSTALLED @ TIME OF COMPLETION OF FIELD SURVEY

SEE SHEET 87 FOR -YIRPC- PROFILE
SEE SHEET 86 FOR -YIRPB- PROFILE
SEE SHEET 2B-25 FOR BRIDGE SKETCH
SEE SHEET 68 FOR -L- PROFILE

78201B
R2721_Hyd_prm_wet_psh_07a.dgn
lbarney

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
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SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
NC FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
R-2721	68
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

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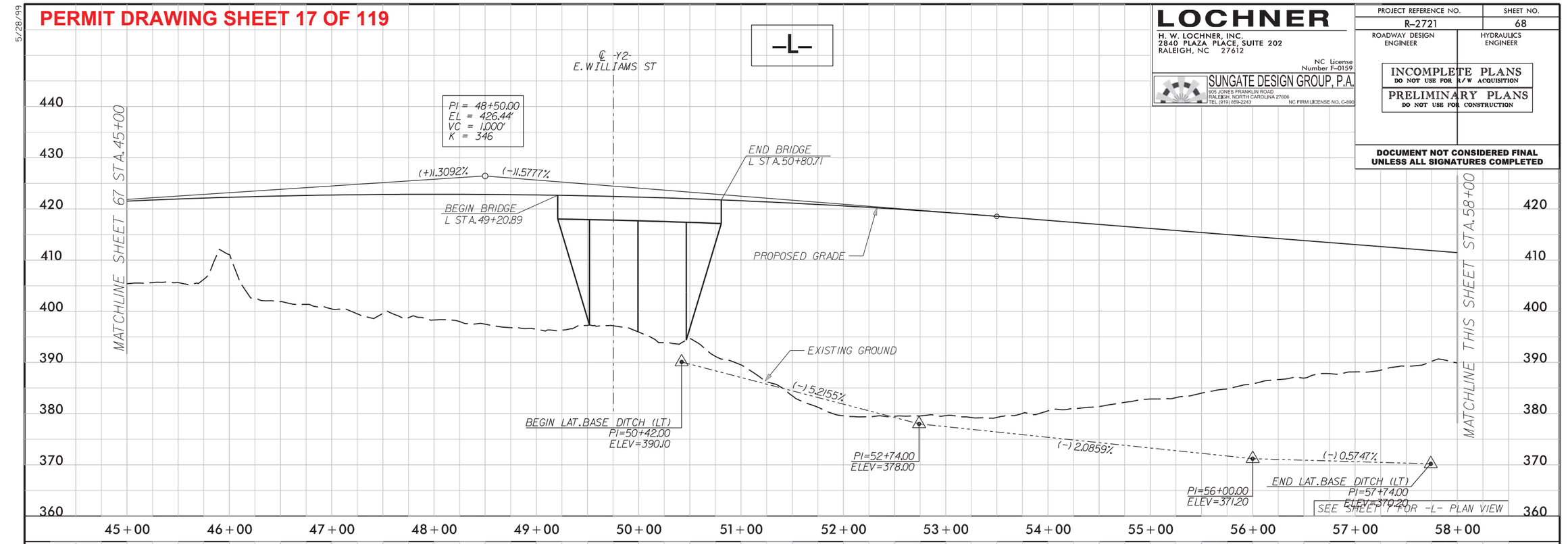

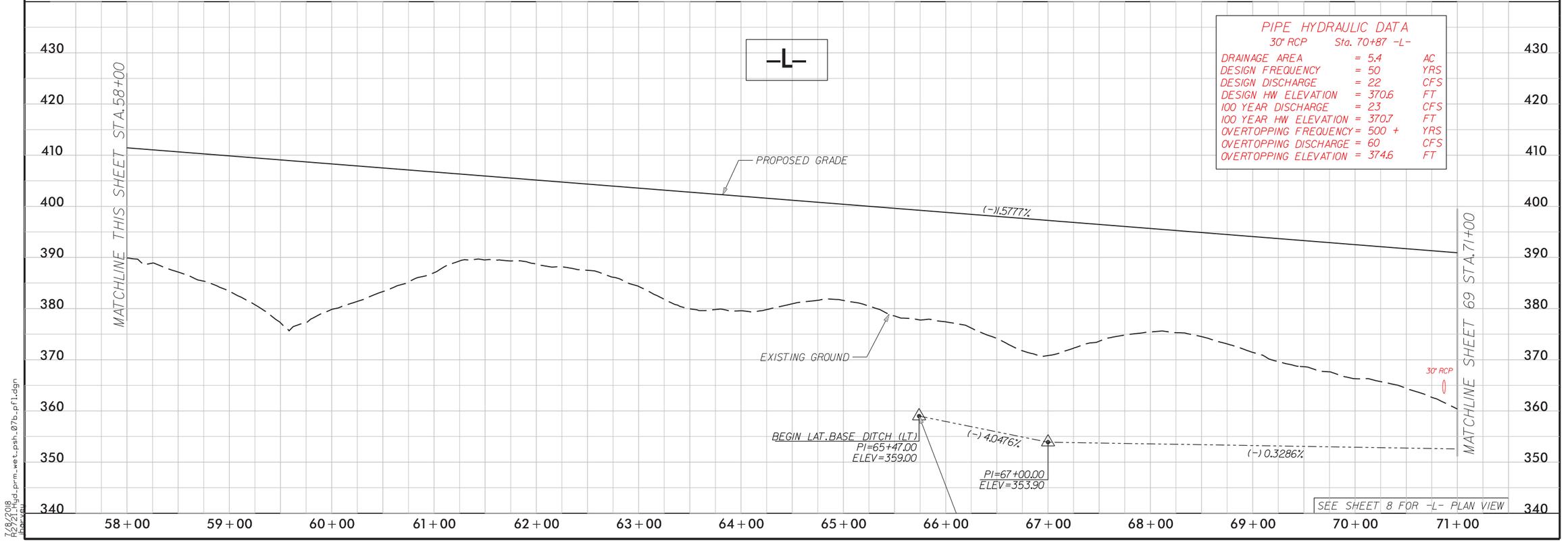

5/28/99

7/8/2018
R2721_Hyd_prm_wet_psh_07b_pfl.dgn
jharvey

6/23/16

PERMIT DRAWING SHEET 18 OF 119

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2721	X-321

10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290

430 420 410 400 390

0.020

397.24

49 + 50.00

:1 8:1 0.020

419.01

2.01:1

396.50

49 + 00.00

430 420 410 400 390

:1 8:1 0.012 0.020

419.21

WETLAND

FILL IN WETLAND (WF)

2.01:1

WETLAND

397.47

48 + 50.00

430 420 410 400 390

7.961:1 0.020 0.02

419.34

WETLAND

FILL IN WETLAND (WF)

2:1

WETLAND

SITE 5

398.30

48 + 00.00

430 420 410 400 390

-L- RT

10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290

7/9/2018
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jharvey

6/23/16

PERMIT DRAWING SHEET 19 OF 119

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2721	X-33

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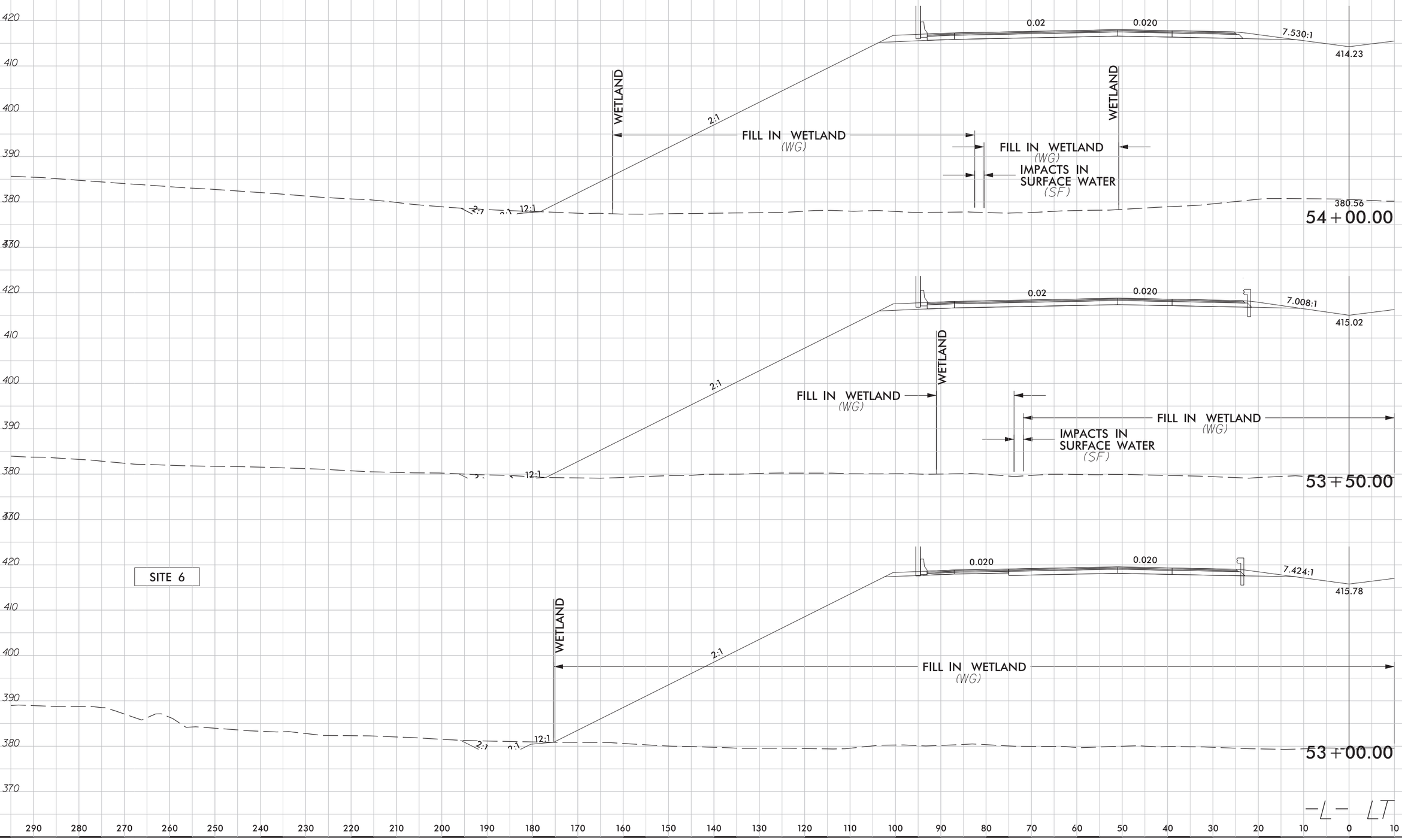
430 420 410 400 390 380 370



7/9/2018
R2721_hyd_prm_wet_psh_07d.xpl.dgn
jharvey

6/23/16

PERMIT DRAWING SHEET 20 OF 119

PROJ. REFERENCE NO.	SHEET NO.
R-2721	X-324

0 5 10

10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290

430 420 410 400 390 380 370

8:1 414.23 8:1 0.020 0.020 2:1

WETLAND WETLAND

FILL IN WETLAND (WG)

380.56

54+00.00

8:1 415.02 8:1 0.020 0.020 2:1

WETLAND

FILL IN WETLAND (WG)

53+50.00

4:1 415.78 8:1 0.020 0.02 2:1

WETLAND

FILL IN WETLAND (WG)

53+00.00

SITE 6

-L- RT

7/9/2018
R2721_grd_prm_wet_psh_07e_xpl.dgn
jharvey

51499

PERMIT DRAWING SHEET 21 OF 119

F F DENOTES FILL IN WETLAND

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′

LOCHNER

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RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 NC FIRM LICENSE NO. C-890

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT REMOVAL
PAVED SHOULDER

NAD 83/95

STREAM SG

STREAM SH

STREAM SJ

CL I RIPRAP LENGTH=10 FT SEE DETAIL 1A

LAT 6' BASE DITCH w/CL I RIPRAP SEE DETAIL 6A

16 MCI ENTERPRISES, LLC

15 BESSIE H. JONES

17 CSP COMMUNITY OWNER, LLC

18 HSA PROPERTIES LLC

SITE 7

SITE 8

SITE 9

SITE 10

-L- TS Sta. 60+14.85

-L- SC Sta. 65+39.35

WETLAND WI

MATCHLINE SHEET 7 -L- STA 58+00.00

MATCHLINE SHEET 9 -L- STA 71+00.00

60+00

65+00

70+00

S 78° 10' 00.1" E

30" RCP-V 3.77%

30" RCP-III 3.30%

TOE PROTECTION SEE DETAIL 38A

SINGLE FACE BARRIER

REUNION CREEK PKWY

CRYSTAL LYNN RAY

LISA M. AND TIMOTHY P. ELLIS

BEVERLY FARAH

JOHN AND PAULETTE GALLAGHER

ASHLEY JANELLE BISCOE

ROY MITCHELL III

JACQUELINE B. SMITH

GARY T. AND ELANA I. MURRAY

SANDRA N. SHECKELLS

TIMOTHY R. GARDNER

SUNSET HILLS SUBDIVISION

JERRY W. AND PAMELA E. LEE

AMH 2014-2 BORROWER, LLC

KEVIN T. BELL

RICHARD B. CLARK AND ANNETTE N. ALDRIDGE

CHRISTINA AND TRACY EVANS

DANA AND WAYLON EDELEN

ANDRE LEROUX

AARON M. AND LAURA N. RACZ

AT&T FIBER INSTALLED SINCE COMPLETION OF FIELD SURVEY

SUNSHINE CREST CT

SPRING DOYLE LN

SEE SHEET 68 FOR -L- PROFILE

PERMIT DRAWING SHEET 22 OF 119

51499

F F DENOTES FILL IN WETLAND

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′

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT REMOVAL
PAVED SHOULDER

NAD 83/95

STREAM SH

STREAM SG

STREAM SJ

SITE 7

SITE 8

SITE 9

SITE 10

WETLAND WI

-L- SC Sta. 65+39.35

-L- TS Sta. 60+14.85

MATCHLINE SHEET 7
-L- STA 58+00.00

MATCHLINE SHEET 9
-L- STA 71+00.00

S 78° 10' 00.1" E

60+00

65+00

70+00

CL I RIPRAP LENGTH=10 FT SEE DETAIL 1A

LAT 6' BASE DITCH w/CL I RIPRAP SEE DETAIL 6A

TOE PROTECTION SEE DETAIL 38A

CL I RIPRAP LENGTH=12 FT SEE DETAIL 1A

16 MCI ENTERPRISES, LLC

17 CSP COMMUNITY OWNER, LLC

18 HSA PROPERTIES LLC

15 BESSIE H. JONES

10

LISA M. AND TIMOTHY P. ELLIS

CRYSTAL LYNN RAY

JACQUELINE B. SMITH

SANDRA N. SHECKELLS

JOHN AND PAULETTE GALLAGHER

GARY T. AND ELANA I. MURRAY

TIMOTHY R. GARDNER

JERRY W. AND PAMELA J. SEE

KEVIN T. BELL

RICHARD B. CLARK AND ANNETTE N. ALDRIDGE

CHRISTINA AND TRACY EVANS

DANA AND WAYDON EOBLEN

AARON M. AND LAURA N. RACZ

ANDRE LEROUX

BEVERLY FARRAR

ASHLEY JANELLE BISCOE

ROY MITCHELL III

ANDRZEJ SZEPIELA AND ELBIETA SAKOWSKI

AMH 2014-2 BORROWER LLC

SUNSET HILLS SUBDIVISION

SUNSHINE CREST CT

SPRING DOVE LN

AT&T FIBER INSTALLED SINCE COMPLETION OF FIELD SURVEY

AT&T FIBER INSTALLED SINCE COMPLETION OF FIELD SURVEY

THOROUGHFARE BUFFER BM 2000 PG 1820

SEE SHEET 68 FOR -L- PROFILE

7/8/2018
R2721_Hyd_prm_wet_psh_08a.dgn
jlgray

6/23/16

PERMIT DRAWING SHEET 23 OF 119

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2721	X-43

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

400 390 380 370 360 350

IMPACTS IN SURFACE WATER (SH)

WETLAND

WETLAND

FILL IN WETLAND (W1)

2:1

12:1

2:1

2:1

0.080

8:1

5.2

390.35

371.45

69+00.00

IMPACTS IN SURFACE WATER (SH)

WETLAND

WETLAND

FILL IN WETLAND (W1)

2:1

12:1

2:1

2:1

0.080

8:1

5.2

391.14

374.52

68+50.00

SITE 8

SITE 9

IMPACTS IN SURFACE WATER (SH)

WETLAND

WETLAND

FILL IN WETLAND (W1)

2:1

12:1

2:1

2:1

0.080

0.080

8:1

5.2

391.93

375.44

68+00.00

-L- LT

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

7/8/2018
R2721Hgd_prm_wet_psh_08b_xp1.dgn
jharvey

51499

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

50' 25' 0 50' 100'

SCALE: 1" = 100'

LOCHNER

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RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 NC FIRM LICENSE NO. C-890

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT REMOVAL
PAVED SHOULDER

NAD 83

MATCHLINE SHEET 8 -L- STA 71+00.00

MATCHLINE SHEET 10 -L- STA 83+00.00

SITE 11 · SITE 8 · SITE 13 · SITE 12 · SITE 10

WETLAND WK · WETLAND WL · WETLAND WL

STREAM SH · STREAM SJ · STREAM SH

HSA PROPERTIES, LLC

TRIANGLE GREENWAYS COUNCIL

LAT 6' BASE DITCH wCL I RIPRAP SEE DETAIL 6A

SANITARY SEWER EASEMENT 24" DIP

SINGLE FACE BARRIER

30" RCP-V · 30" RCP-III · 1@6'X8' RCBC · 1.07% · 15" RCP-IV

75+00 · 80+00

2GI-A · 2GI · 10GI

30" W/ 2 ELBOWS · JB wMH · 36" · 15" W/ 2 ELBOWS

LAT 2' BASE DITCH wCL B RIPRAP SEE DETAIL 4A

TOE PROTECTION SEE DETAIL 38A

CL B RIPRAP OUTLET CHANNEL SEE DETAIL 47A

RIP RAP

END FENCE 8.20 Rt -L- 84.42' LT

JAMES AND DONNA MULLEN · MATTHEW J. KRISTIV AND MELISSA M. DIFONDI · DAVID L. AND ELIZABETH S. DOUGLAS · CLIFFORD J. BARTH · STEVEN DICKENS · JARED AND AMANDA MESTLER · NEAL GOODWIN · BRADLEY O. AND DIANA I. RINGLIEN · COREY A. NORTON · SUNSET HILLS HOMEOWNERS' ASSOC. · WILLIAM D. HAYES AND KIMBERLY A. BURRELL · JUSTICE ACRES HOMEOWNERS ASSOC.

THORNCREST DR · 26' BST · AT&T FIBER INSTALLED SINCE COMPLETION OF FIELD SURVEY

DETAIL 47A
CULVERT OUTLET CHANNEL STABILIZATION
(Not to Scale)
Natural Bed Elevation
CL 'II' RIPRAP
CL 'I' RIPRAP
Geotextile
CL 'I' RIPRAP LINED CHANNEL BED
Length (Outlet) = 60 Ft.
STA. 79+00 -L- RT

8" PVC END UNK · 15" RCP · 20' SLOPE DRAIN LINK 8M TYPE PG BTT

SEE SHEET 69 FOR -L- PROFILE

7/8/2019
R2721_Hyd_prm_wet_psh_09.dgn
lhoover

51499

PERMIT DRAWING SHEET 25 OF 119

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

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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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

PAVEMENT REMOVAL
PAVED SHOULDER

NAD 83

MATCHLINE SHEET 8 -L- STA 71+00.00

MATCHLINE SHEET 10 -L- STA 83+00.00

SITE 11
SITE 10
SITE 8
SITE 12
SITE 13

WETLAND WK
WETLAND WL
STREAM SJ
STREAM SH

SINGLE FACE BARRIER
SANITARY SEWER EASEMENT
8" DIP
24" DIP
72" WD
12" WD
30" RCP-III
15" RCP-IV
1@6'X8' RCBC
1.07%
2GI-A
2GI
30" W 2 ELBOWS
15" W 2 ELBOWS
JB w/MH
36"
18"
LAT 6' BASE DITCH w/CL I RIPRAP SEE DETAIL 6A
LAT 2' BASE DITCH w/CL B RIPRAP SEE DETAIL 4A
CL B RIPRAP OUTLET CHANNEL SEE DETAIL 47A
TOE PROTECTION SEE DETAIL 28A
TREE PROTECTION SEE DETAIL 38X
END FENCE STA 80+10.75 -L- 84.42' LT
8" PVC END UNK
20" SIDE DRAIN UNK 60' TYP PS BTW
CB
INV=356.45
TOP=362.70'

TRIANGLE GREENWAYS COUNCIL
WEAL CREEK
BZ 1
BZ 2

JAMES AND DONNA MULLEN
MATTHEW J. KRISTIV AND MELISSA M. DIFONDI
DAVID L. AND ELIZABETH S. CHICAS
CLIFFORD BARTH
STEVEN DICKENS
JARED AND AMANDA MESTLER
NEAL GOODWIN
BRADLEY O. AND DIANA I. RINGLIEN
COREY A. NORTON
SUNSET HILLS HOMEOWNERS' ASSOC.
WILLIAM D. HAYES AND KIMBERLY A. VBURRELL
HSA PROPERTIES, LLC

THORNCREST DR
AT&T FIBER INSTALLED SINCE COMPLETION OF FIELD SURVEY

DETAIL 47A
CULVERT OUTLET CHANNEL STABILIZATION
(Not to Scale)
Natural Bed Elevation
NG
CL II RIPRAP
1.5'
Geotextile
Length (Outlet)= 60 Ft.
6'
CL I RIPRAP LINED CHANNEL BED
STA. 79+00 -L- RT

SEE SHEET 69 FOR -L- PROFILE

782018
R2721_hyd_prm_wet_psh_09a.dgn
jlhickey

PERMIT DRAWING SHEET 26 OF 119

5/28/99

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 260	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 357.9	FT
BASE DISCHARGE	= 280	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 358.2	FT
OVERTOPPING DISCHARGE	= 680	CFS
OVERTOPPING FREQUENCY	= > 500	YRS
OVERTOPPING ELEVATION	= 364.2	FT

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RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
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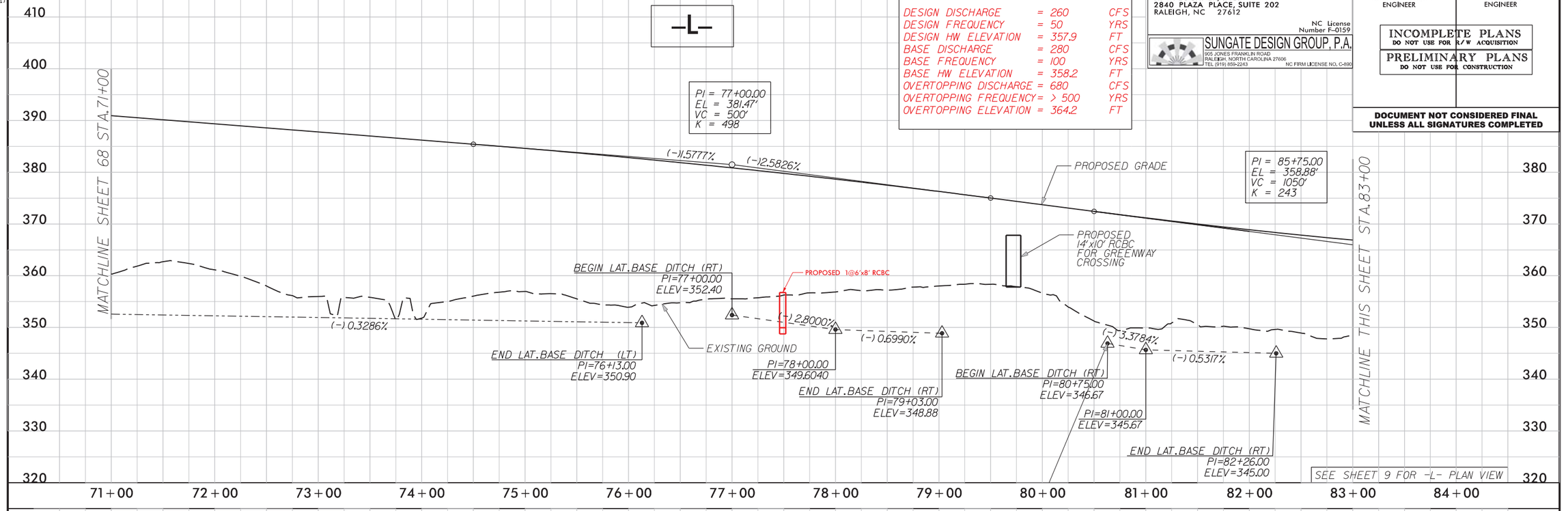
PROJECT REFERENCE NO.	SHEET NO.
R-2721	69
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

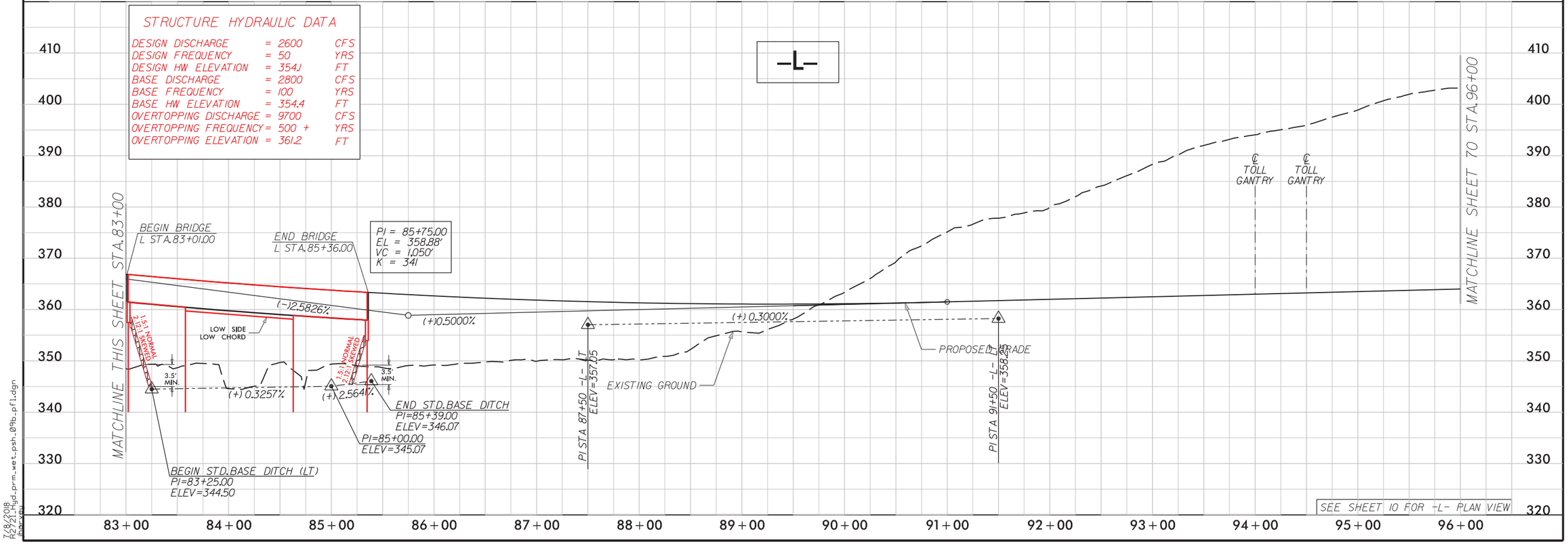
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



STRUCTURE HYDRAULIC DATA

DESIGN DISCHARGE	= 2600	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 354.1	FT
BASE DISCHARGE	= 2800	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 354.4	FT
OVERTOPPING DISCHARGE	= 9700	CFS
OVERTOPPING FREQUENCY	= 500 +	YRS
OVERTOPPING ELEVATION	= 361.2	FT



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jbarvey

6/23/16

PERMIT DRAWING SHEET 27 OF 119

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2721	X-46

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

400 390 380 370 360 350

WETLAND

SITE 11

EXCAVATION

FILL IN WETLAND (WK)

2:1 2:1 12:1 2:1

0.080

8:1 5.2

383.25

355.83

73+50.00

WETLAND

IMPACTS IN SURFACE WATER (SH)

SITE 8

2:1 2:1 12:1 2:1

0.080

8:1 5.2

384.04

356.00

73+00.00

SITE 8

2:1 2:1 12:1 2:1

0.080

8:1 5.2

384.83

358.02

72+50.00

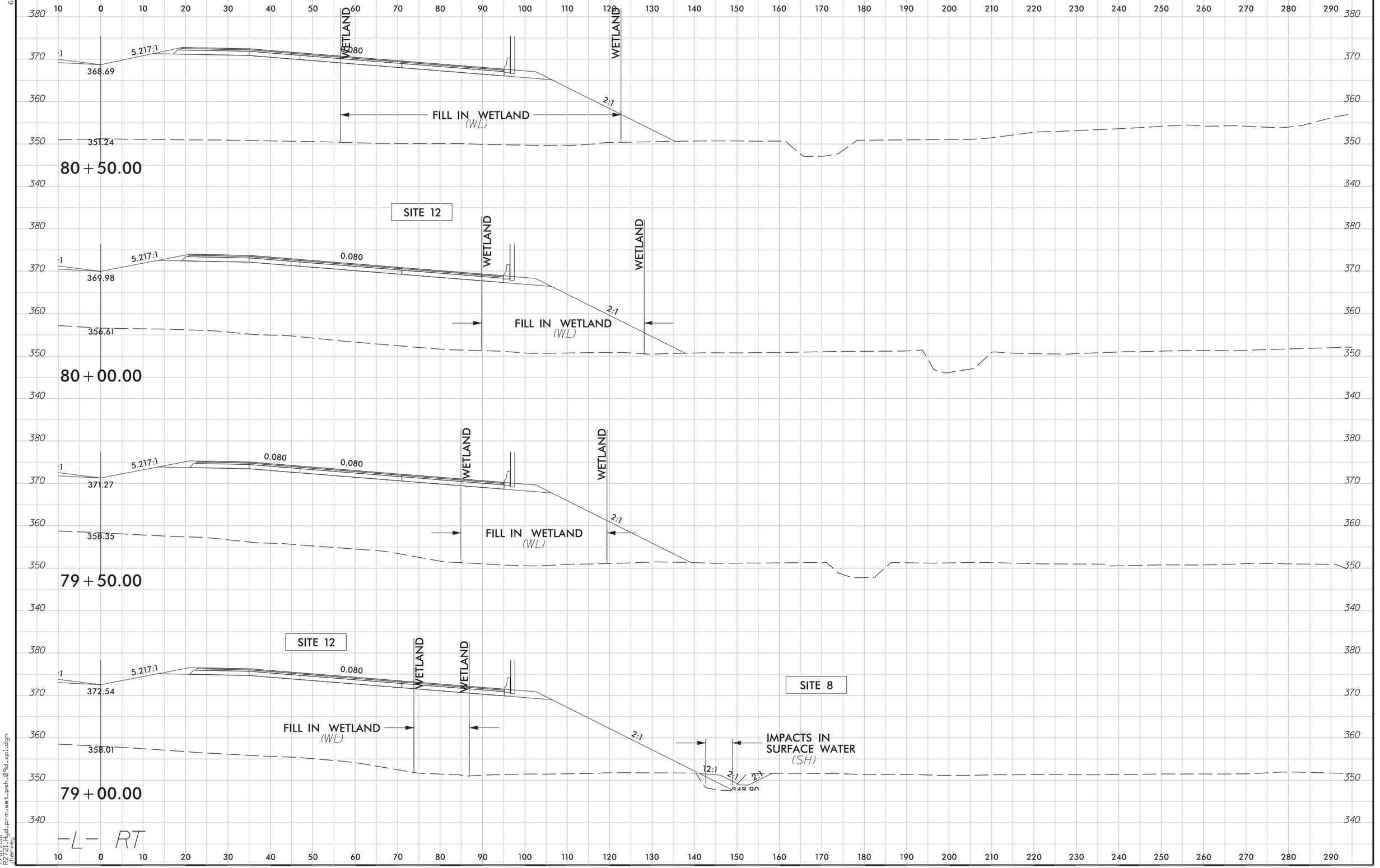
-L- LT

7/8/2018
R2721_hyd_prm_wet_psh_09c_xpl.dgn
jharvey

6/23/16

PERMIT DRAWING SHEET 28 OF 119

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2721	X-341



7/9/2018
R2721_hyd_prm_wet_psh_09d_xpl.dgn
jharvey

6/23/16

PERMIT DRAWING SHEET 29 OF 119

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2721	X-51

SITE 13

WETLAND

WETLAND

2:1

FILL IN WETLAND
(WL)

0.060

8:1

6.0

365.43

349.75

82+00.00

WETLAND

SITE 12

0.066

WETLAND

8:1

5.7

2:1

FILL IN WETLAND
(WL)

366.45

350.53

81+50.00

WETLAND

0.074

8:1

5.4

2:1

367.52

FILL IN WETLAND
(WL)

349.90

81+00.00

SITE 12

WETLAND

WETLAND

WETLAND

WETLAND

0.080

8:1

5.2

2:1

368.69

FILL IN WETLAND
(WL)

351.24

80+50.00

-L- LT

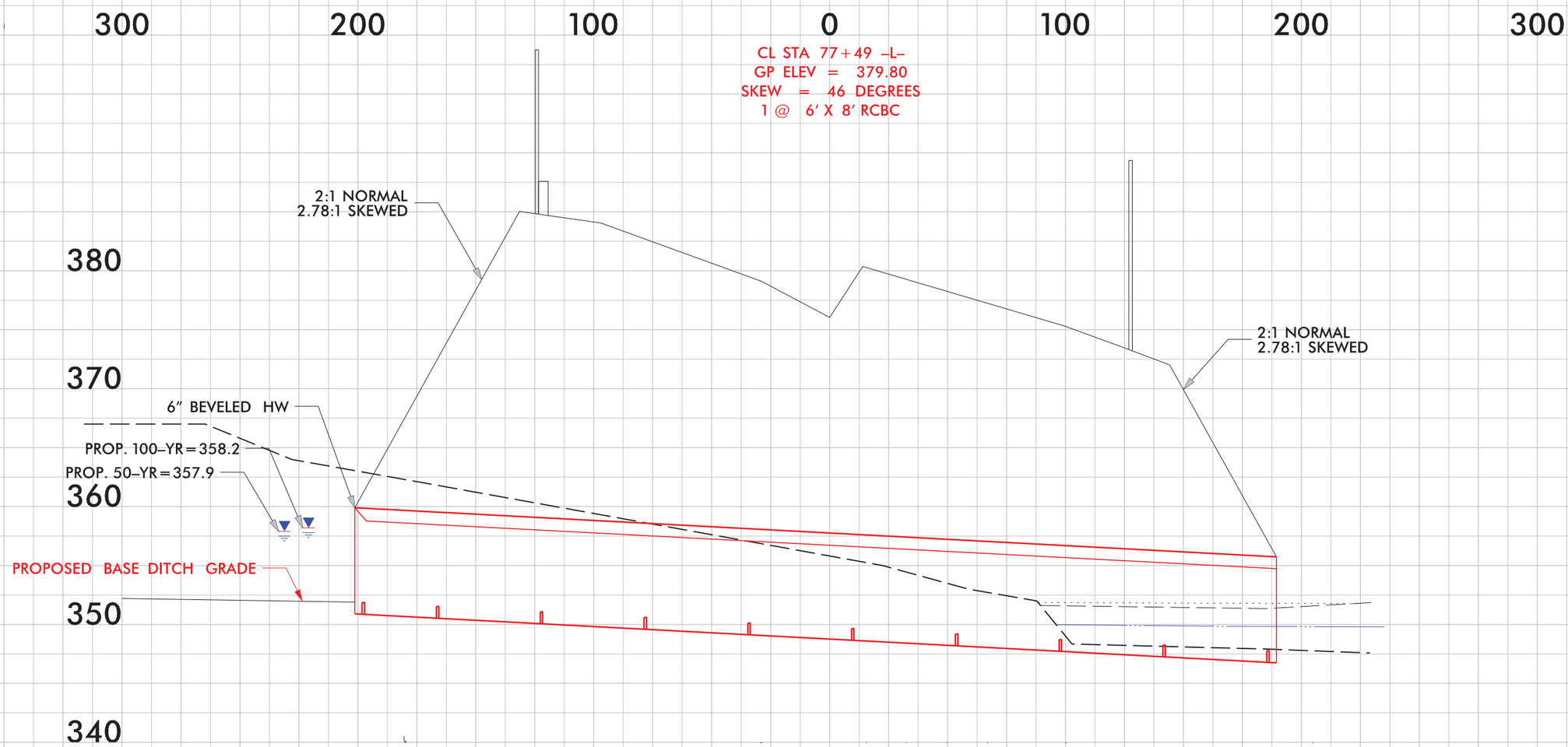
7/9/2018
R2721hyd_prm_wet_psh_09e_xpl.dgn
jharvey

PERMIT DRAWING SHEET 30 OF 119

PROJECT REFERENCE NO.	SHEET NO.
U-2721	9F
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

7/8/2018
R2721_Hyd_prm_wet_psh_09f_sec.dgn
jharvey

PERMIT DRAWING SHEET 31 OF 119

51499

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

NAD 83

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

PAVEMENT REMOVAL
PAVED SHOULDER

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
NC FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
R-2721	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

JACLYN AND JEREMY KRING
CURRIN BROS. INC
TRIANGLE GREENWAYS COUNCIL
BRIAN L. AND DEANNA C. HAMILTON
LOUIS C. III AND SHIRLEY R. DAVIS
DERRICK P. AND MICHELLE G. ARQUIETT
TIANLIN AND JUHONG LIU WANG
NC DEPT. OF TRANSPORTATION
SUNSET HILLS HOMEOWNERS ASSOCIATION
HSA PROPERTIES LLC

PRIVATE UTILITY EASEMENT
PUE
SIG-COLONIAL PIPELINE EASEMENT
DB 1524 PG 161
DB 1894 PG 340
PC 340 161

STREAM SM
WETLAND WR
-L- CS Sta. 83+79.88
-L- ST Sta. 89+04.88
-L- S 30° 52' 10.3" E

SITE 14
SITE 14A
SITE 15

STANDARD BASE DITCH SEE DETAIL 32A
TOE PROTECTION SEE DETAIL 38A
SPEC CUT V-DITCH SEE DETAIL 12A
BEGIN FENCE 54.35 LT 84.42 LT
TAIL DITCH w/CL II RIPRAP SEE DETAIL 37A
20' SEWER EASEMENT DB 1998 PG 817

15" RCP-III
18" RCP-III
24" RCP-III
36" RCP-III
48" RCP-III
54" RCP-III
2GI
2GI-A
FS
RCB
RMH
FES

85+00
90+00
95+00

MATCHLINE SHEET 9 -L- STA 83+00.00
MATCHLINE SHEET 11 -L- STA 96+00.00

SEE SHEET 2B-26 FOR BRIDGE SKETCH
SEE SHEET 69 FOR -L- PROFILE

7/2/2018
R-2721_Hyd_prm_wet_psh_10.dgn
jhopper

PERMIT DRAWING SHEET 32 OF 119

51499

50′ 25′ 0 50′ 100′
SCALE: 1″=100′

NAD 83

LOCHNER	PROJECT REFERENCE NO.	SHEET NO.
H. W. LOCHNER, INC. 2840 PLAZA PLACE, SUITE 202 RALEIGH, NC 27612 NC License Number F-0159	R-2721	10
SUNGATE DESIGN GROUP, P.A. 905 JONES FRANKLIN ROAD RALEIGH, NORTH CAROLINA 27606 TEL (919) 859-2243 NC FIRM LICENSE NO. C-890	RW SHEET NO.	
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
PRELIMINARY PLANS DO NOT USE FOR CONSTRUCTION		
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		

PAVEMENT REMOVAL
PAVED SHOULDER

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

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. ARQUIETT
PRIVATE UTILITY EASEMENT
PUE
SC COLONIAL PIPELINE CO. BB 1994 PG 1425 BB 1994 PG 1431 BB 2004 PG 161 SPRAYLINE EASEMENT
NC DEPT. OF TRANSPORTATION
HSA PROPERTIES LLC
SUNSET HILLS HOMEOWNERS ASSOCIATION
SUNSET HILLS HOMEOWNERS ASSOCIATION
20' SEWER EASEMENT BB 1998 PG 4171
24" PVC END USM
MH-4 RIM=348.42

STREAM SM
WETLAND WR
℄ CS Sta. 83+79.88
℄ ST Sta. 89+04.88
BEGIN FENCE S 54.35 LT 84.42 LT
SITE 14
SITE 14A
SITE 15
STANDARD BASE DITCH SEE DETAIL 32A
TOE PROTECTION SEE DETAIL 38A
SPEC CUT V-DITCH SEE DETAIL 12A
TAIL DITCH w/CL II RIPRAP SEE DETAIL 37A
TOE PROTECTION SEE DETAIL 38A
PEET

19 23 25 24 10 22 21

85+00 90+00 95+00

2GI 2GI-A 18" RCP-III 24" RCP-III 54" RCP-III 48" RCP-III 15" RCP-III FS

S 30° 52′ 10.3″ E

MATCHLINE SHEET 9 –L– STA 83+00.00

MATCHLINE SHEET 11 –L– STA 96+00.00

SEE SHEET 2B-26 FOR BRIDGE SKETCH
SEE SHEET 69 FOR –L– PROFILE

6/23/16

PERMIT DRAWING SHEET 33 OF 119

PROJ. REFERENCE NO.	SHEET NO.
R-2721	X-53

0 5 10

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

370 360 350 340

WETLAND

0.060
2:13:1
8:1
6.0
358.76
FILL IN WETLAND
(WR)
349.79

86 + 50.00

WETLAND

0.060
2:1
8:1
6.0
359.21
FILL IN WETLAND
(WR)
349.20

86 + 00.00

WETLAND

WETLAND

SITE 15

WETLAND

0.060
2:1
8:1
6.0
359.73
FILL IN WETLAND
(WR)
348.66

85 + 50.00

SITE 14A

0.020
IMPACTS IN SURFACE WATER
(SM)
349.36

85 + 00.00

2:1
2:1
12:1
345.81

0.020

2:1
2:1
12:1
345.57
349.70

84 + 50.00

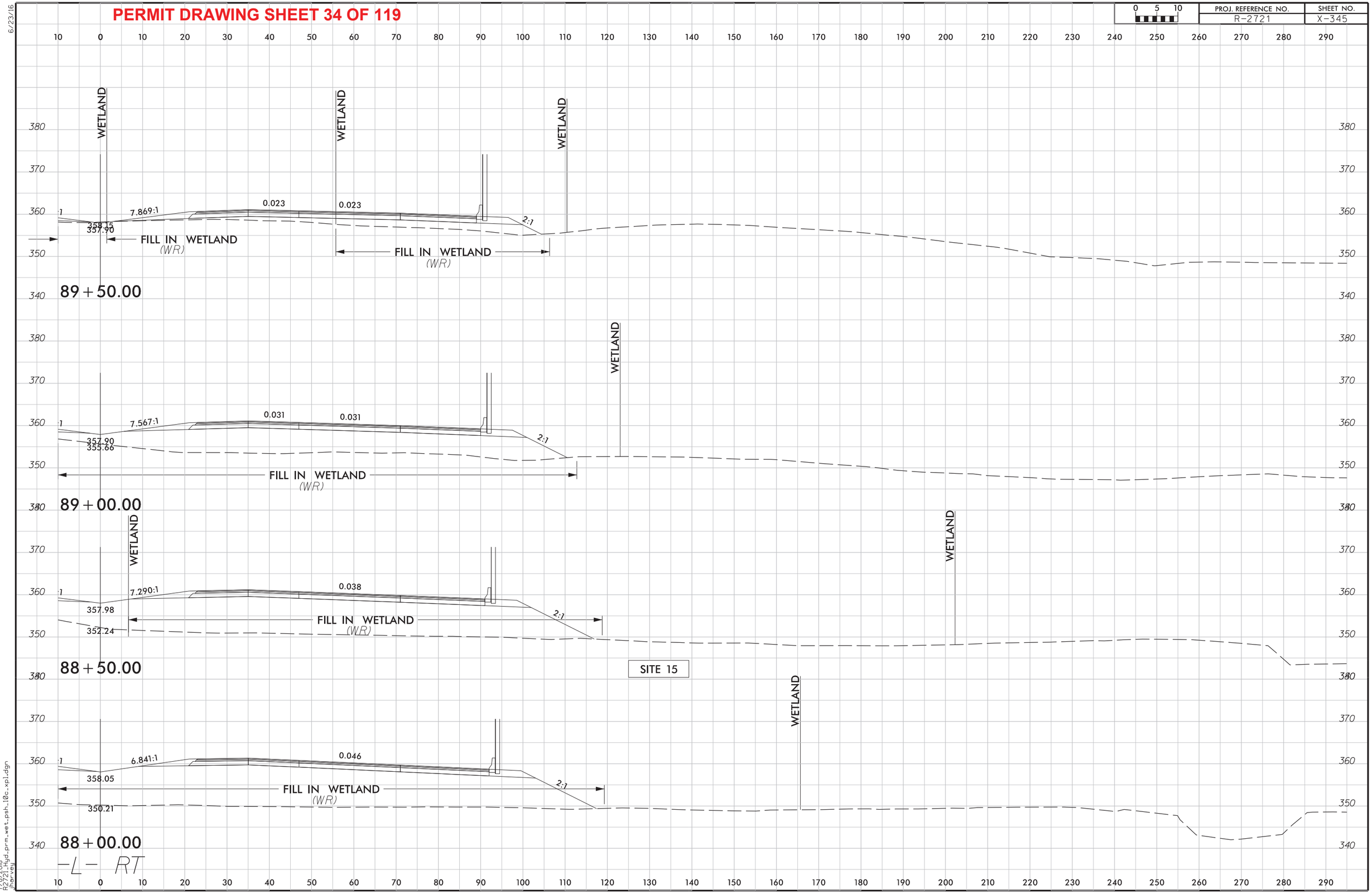
-L- LT

7/8/2018
R2721_grd_prm_wet_psh_10b_xpl.dgn
jharvey

6/23/16

PERMIT DRAWING SHEET 34 OF 119

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2721	X-345



7/8/2018
R2721_hyd_prm_wet_psh_10c_xpl.dgn
jharvey

51499

PERMIT DRAWING SHEET 35 OF 119

50′ 25′ 0 50′ 100′
SCALE: 1″=100′

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 NC FIRM LICENSE NO. C-890

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT REMOVAL
PAVED SHOULDER

NAD 83

ALVIN L. AND STACEY CARTER COLEY
SCOTT A. AND JENNIFER B. LANGFELDT
ANDREW J. AND MELISSA R. FELTON
LIZA M. RIVERA
JOHN C. VOLPI
NASIM AHMED
29 JAMES C. AND LIAN LIU WALKER
28 JORDAN C. AND CALLIE E. HESS
ALYSIA DANETTE DAGADU BENOIT K. AND
24 NC DEPT. OF TRANSPORTATION
25
26 THE MATA FAMILY, LLC
27 THE MATA FAMILY, LLC

MATCHLINE SHEET 43 -Y3- STA 32+00.00
MATCHLINE SHEET 10 -L- STA 96+00.00
MATCHLINE SHEET 12 -L- STA 109+00.00
MATCHLINE SHEET 42 -Y3- STA 22+00.00

-L- TS Sta. 98+31.10
-L- SC Sta. 101+51.10
-Y3- PC Sta. 23+09.88
-L- POC Sta.103+53.19=
-Y3- POC Sta.27+12.96
△ = 133°23'27.16"
S 30° 52' 10.3" E
S 68° 08' 00.2" E

BERM DITCH STA. 102+00 – 103+90 -L- LT
24" W/ 3 ELBOWS
24" W/ 2 ELBOWS
24" RCP-IV
30" RCP-IV
18" RCP-III
24" RCP-III
30" RCP-III
36" RCP-III
42" RCP-III
48" RCP-III
15" RCP-III
18" RCP-III
2GI
2GI-A
FS
CB
BDO
REMOVE
SPEC CUT V-DITCH SEE DETAIL 12A
20' DRAINAGE EASEMENT SM 8003 PG 234
ACCESSIBLE TELEPHONE EASEMENT APPROXIMATE LOCATION SM 1994 PG 150
PUE
WETLAND WU
SITE 16
TOTAL TAKE
E E DENOTES EXCAVATION IN WETLAND

SEE SHEET 101 FOR -Y3- PROFILE
SEE SHEET 2B-26 FOR BRIDGE SKETCH | SEE SHEET 70 FOR -L- PROFILE

7/8/2018
R-2721_Hyd_prm_wet_psh_11.dgn
lhunter

51499

PERMIT DRAWING SHEET 36 OF 119

SCALE: 1" = 100'

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
NC FIRM LICENSE NO. C-890

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT REMOVAL
PAVED SHOULDER

NAD 83

MATCHLINE SHEET 43
-Y3- STA 32+00.00

MATCHLINE SHEET 10
-L- STA 96+00.00

MATCHLINE SHEET 12
-L- STA 109+00.00

MATCHLINE SHEET 42
-Y3- STA 22+00.00

ALVIN L. AND STACEY CARTER COLEY
SCOTT A. AND JENNIFER B. LANGFELDT
ANDREW J. AND MELISSA R. FELTON
LIZA M. RIVERA
JOHN C. VOLPI
NASIM AHMED
JORDAN C. AND CALLIE E. HESS
JAMES C. AND LIAN LIU WALKER
ALYSIA DANETTE DAGADUT BENOIT K. AND
NC DEPT. OF TRANSPORTATION
THE MATA FAMILY, LLC
WETLAND WU

-L- TS Sta. 98+31.10
-L- SC Sta. 101+51.10
-L- S 30° 52' 10.3" E
-Y3- PC Sta. 23+09.88
-L- POC Sta. 103+53.19=
-Y3- POC Sta. 27+12.96
Δ = 133°23'27.16"
S 68° 08' 00.2" E

BERM DITCH
STA. 102+00 - 103+90 -L- LT
+79.50 -Y3DETR- 45.00 LT
+33.57 -Y2DETR- 45.00 LT
24" W/ 3 ELBOWS
24" W/ 2 ELBOWS
24" RCP-IV
SPEC CUT V-DITCH SEE DETAIL 12A
+00.62 -Y3- 80.00' RT
+00.00 -Y3- 90.00' RT
109.88 -Y3- 100.00' RT

SITE 16
TOTAL TAKE

E E DENOTES EXCAVATION IN WETLAND

SEE SHEET 101 FOR -Y3- PROFILE
SEE SHEET 2B-26 FOR BRIDGE SKETCH | SEE SHEET 70 FOR -L- PROFILE

PERMIT DRAWING SHEET 37 OF 119

51499

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

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 NC FIRM LICENSE NO. C-890

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT REMOVAL
PAVED SHOULDER

NAD 83

MATCHLINE SHEET 11 -L- STA 109+00.00

MATCHLINE SHEET 13 -L- STA 122+00.00

HOLLY SPRINGS RESIDENTIAL PROPERTIES LLC
BM 2008 PG 105

31 HOLLY SPRINGS RESIDENTIAL PROPERTIES LLC

M/I HOMES OF RALEIGH LLC U/C

KEVIN AND SUSAN CASSANO 3SFD U/C

SCHANTEL AND RODERICK BOURKNIGHT 3SFD

ROBERT AND JENNIFER SMITH 3SFD CONC

MICHAEL AND PAMELA WHITE 3SFD CONC

MAURICE AND JAMILA MINGA 2SFD CONC

M/I HOMES OF RALEIGH LLC U/C

M/I HOMES OF RALEIGH LLC

BERM DITCH STA. 108+80 -L- 111+00 -L- LT

BERM DITCH STA. 116+00 -L- 117+50 -L- LT

TDE

BDO

26 THE MATA FAMILY, LLC

WETLAND WU

36 HOLLY SPRINGS RESIDENTIAL PROPERTIES LLC

37 NC DEPT OF TRANSPORTATION

50' I-540 C-255 BUFFER BM 2008 PG 109

25' COMMON OPEN SPACE BM 2008 PG 109

20' TOWN OF HOLLY SPRINGS WATERLINE EASEMENT BM 2011 PG 72

+50.02 -L- 215.69' LT

+00.00 -L- 220.00' LT

+50.00 -L- 215.00' LT

+00.00 -L- 202.03' LT

42" RCP-III

18" RCP-III

15" RCP-III

18" W 2 ELBOWS

2GI

2GI-D

2GI-B

FS

100+00

115+00

120+00

SITE 16

SITE 17

27 THE MATA FAMILY, LLC

WETLAND WV

DAYLIGHT DITCH

TOE PROTECTION SEE DETAIL 38A

CL I RIPRAP

LAT V-DITCH w/CL I RIPRAP SEE DETAIL 28A

GRADE TO DRAIN (GTD)

50' TEMPORARY ACCESS & AT-WILL ENCROACHMENT EASEMENT BM 2007 PG 2789 BM 2011 PG 72

38 NC DEPT OF TRANSPORTATION

32 HOLLY SPRINGS RESIDENTIAL PROPERTIES LLC

33 M/I HOMES OF RALEIGH LLC

34 M/I HOMES OF RALEIGH LLC

35 M/I HOMES OF RALEIGH LLC

1.5SFD YAN QIN

20' TYPE A-20 PERIMETER BUFFER BM 2016 PG 455

HOLLY SPRINGS RESIDENTIAL PROPERTIES LLC

M/I HOMES OF RALEIGH LLC

50' I-540 C-255 BUFFER BM 2016 PG 455

RETAIN

EXISTING R/W

F F DENOTES FILL IN WETLAND

E E DENOTES EXCAVATION IN WETLAND

DENOTES MECHANIZED CLEARING

SEE SHEET 70 FOR -L- PROFILE

7R2018
R2721_Hyd_prm_wet_psh_12.dgn
jhorney

PERMIT DRAWING SHEET 38 OF 119

51499

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

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
NC FIRM LICENSE NO. C-890

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT REMOVAL
PAVED SHOULDER

NAD 83

MATCHLINE SHEET 11 -L- STA 109+00.00

MATCHLINE SHEET 13 -L- STA 122+00.00

BM 2008 PG 105

HOLLY SPRINGS RESIDENTIAL PROPERTIES LLC

M/I HOMES OF RALEIGH LLC U/C

KEVIN AND SUSAN CASSANO

SCHANTEL AND RODERICK BOURKNIGHT

ROBERT AND JENNIFER SMITH

MICHAEL AND PAMELA WHITE

MAURICE AND JAMILA MINGA

M/I HOMES OF RALEIGH LLC

M/I HOMES OF RALEIGH LLC

BERM DITCH STA. 108+80 – 111+00 –L– LT

BERM DITCH STA. 116+80 – 117+50 –L– LT

TDE

BDO

26 THE MATA FAMILY, LLC

26" W 2 ELBOWS

2GI

WETLAND WU

36 HOLLY SPRINGS RESIDENTIAL PROPERTIES LLC

37 NC DEPT OF TRANSPORTATION

18" W 2 ELBOWS

2GI-D

50' I-540 C-255 BUFFER BM 2008 PG 109

25' COMMON OPEN SPACE BM 2008 PG 109

30' TOWN OF HOLLY SPRINGS WATERLINE EASEMENT BM 2011 PG 72

42" RCP-III

18" RCP-III

15" RCP-III

2GI-B

SITE 16

27 THE MATA FAMILY, LLC

WETLAND WV

SITE 17

DAYLIGHT DITCH

TOE PROTECTION SEE DETAIL 38A

CL I RIPRAP

LAT V-DITCH w/CL I RIPRAP SEE DETAIL 12BA

50' TEMPORARY ACCESS & AT-WILL ENCROACHMENT EASEMENT BM 2007 PG 2789 BM 2011 PG 72

GRADE TO DRAIN (GTD)

38 NC DEPT OF TRANSPORTATION

50' I-540 C-255 BUFFER BM 2016 PG 455

34

33

35

RETAIN

32 HOLLY SPRINGS RESIDENTIAL PROPERTIES LLC

20' TYPE A-20 PERIMETER BUFFER BM 2016 PG 455

M/I HOMES OF RALEIGH LLC

HOLLY SPRINGS RESIDENTIAL PROPERTIES LLC

HOLLY SPRINGS RESIDENTIAL PROPERTIES LLC

M/I HOMES OF RALEIGH LLC

M/I HOMES OF RALEIGH LLC

1.5SFD YAN QIN

EXISTING R/W

F F DENOTES FILL IN WETLAND

E E DENOTES EXCAVATION IN WETLAND

DENOTES MECHANIZED CLEARING

SEE SHEET 70 FOR -L- PROFILE

782018
R2721_Hyd_prm_wet_psh_12a.dgn
lhorvey

PERMIT DRAWING SHEET 39 OF 119

5/28/99

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159

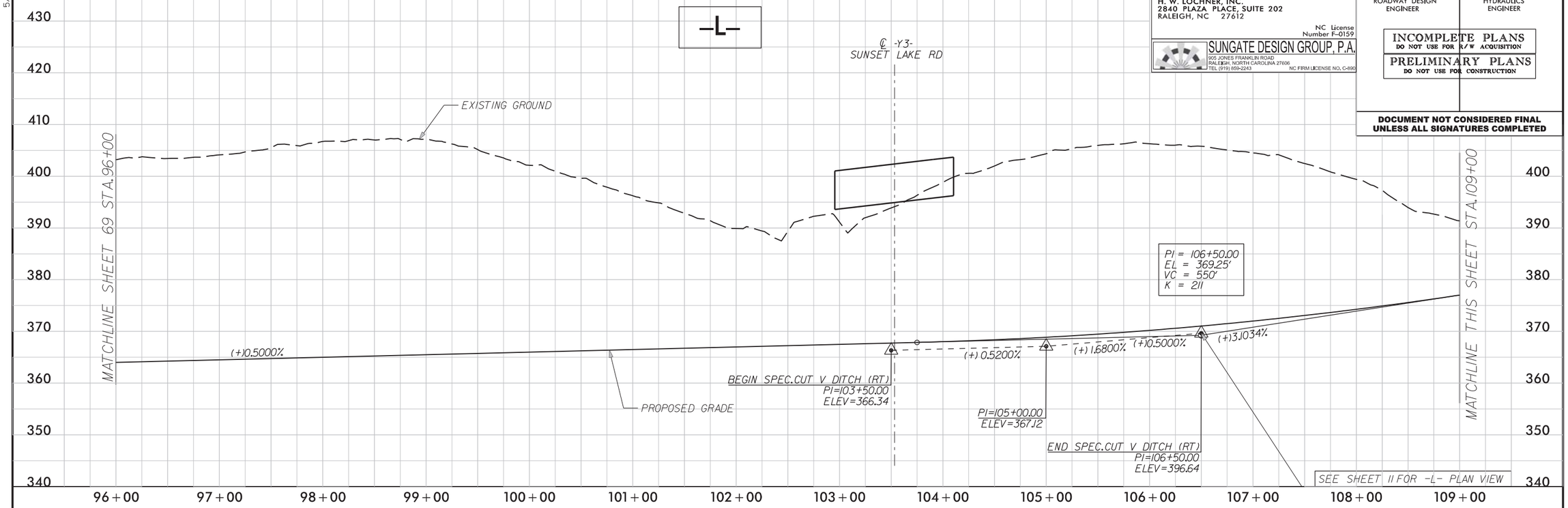
SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 NC FIRM LICENSE NO. C-890

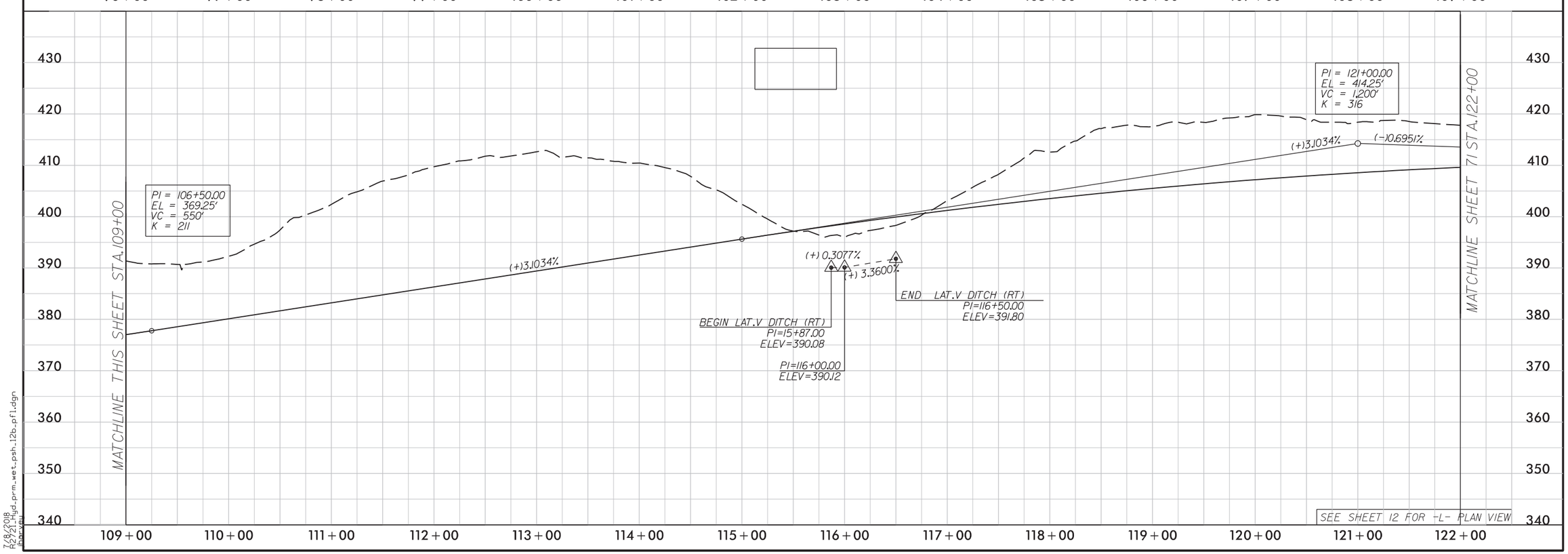
PROJECT REFERENCE NO.	SHEET NO.
R-2721	70
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





7/8/2018
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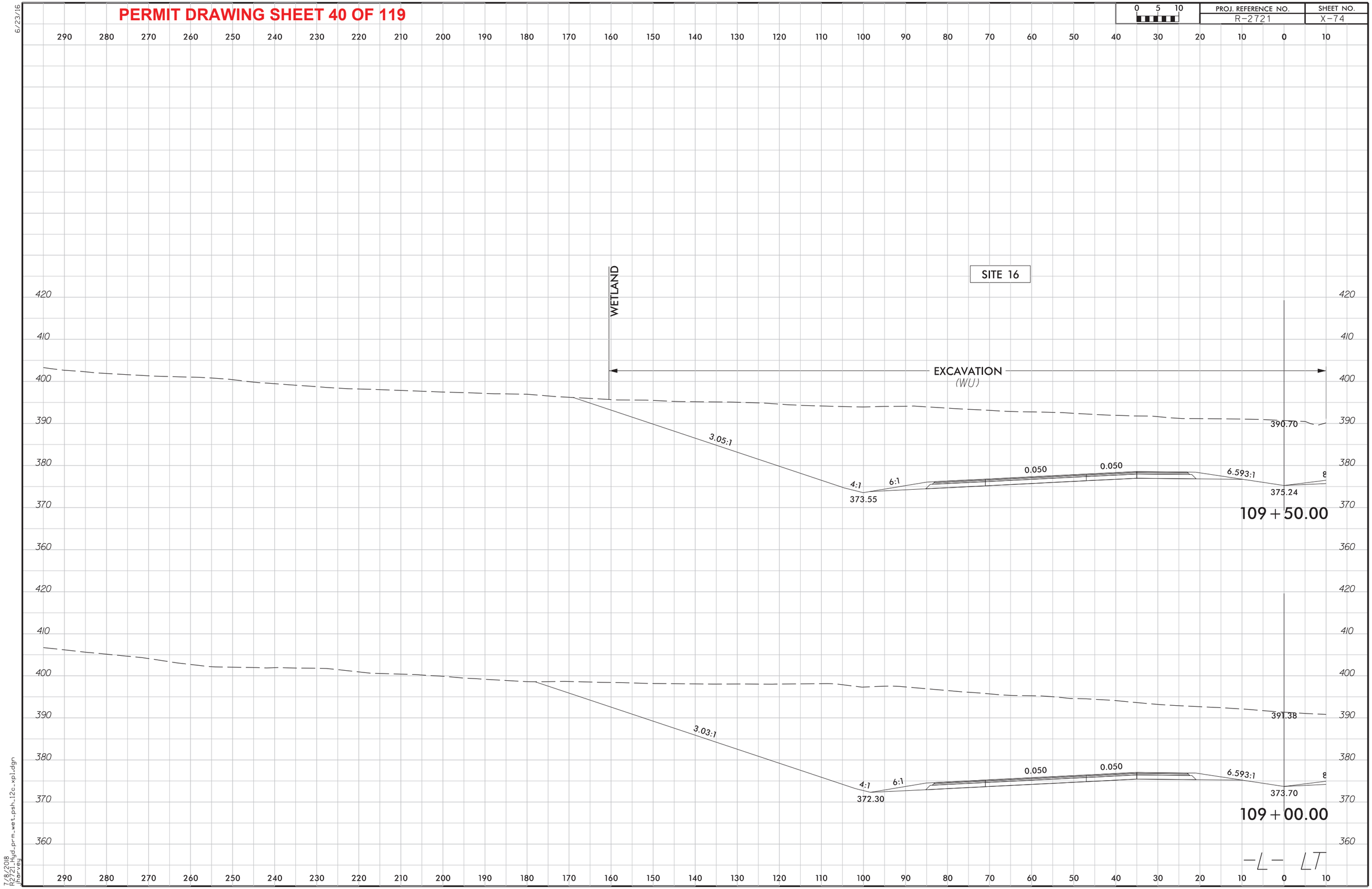
jharvey

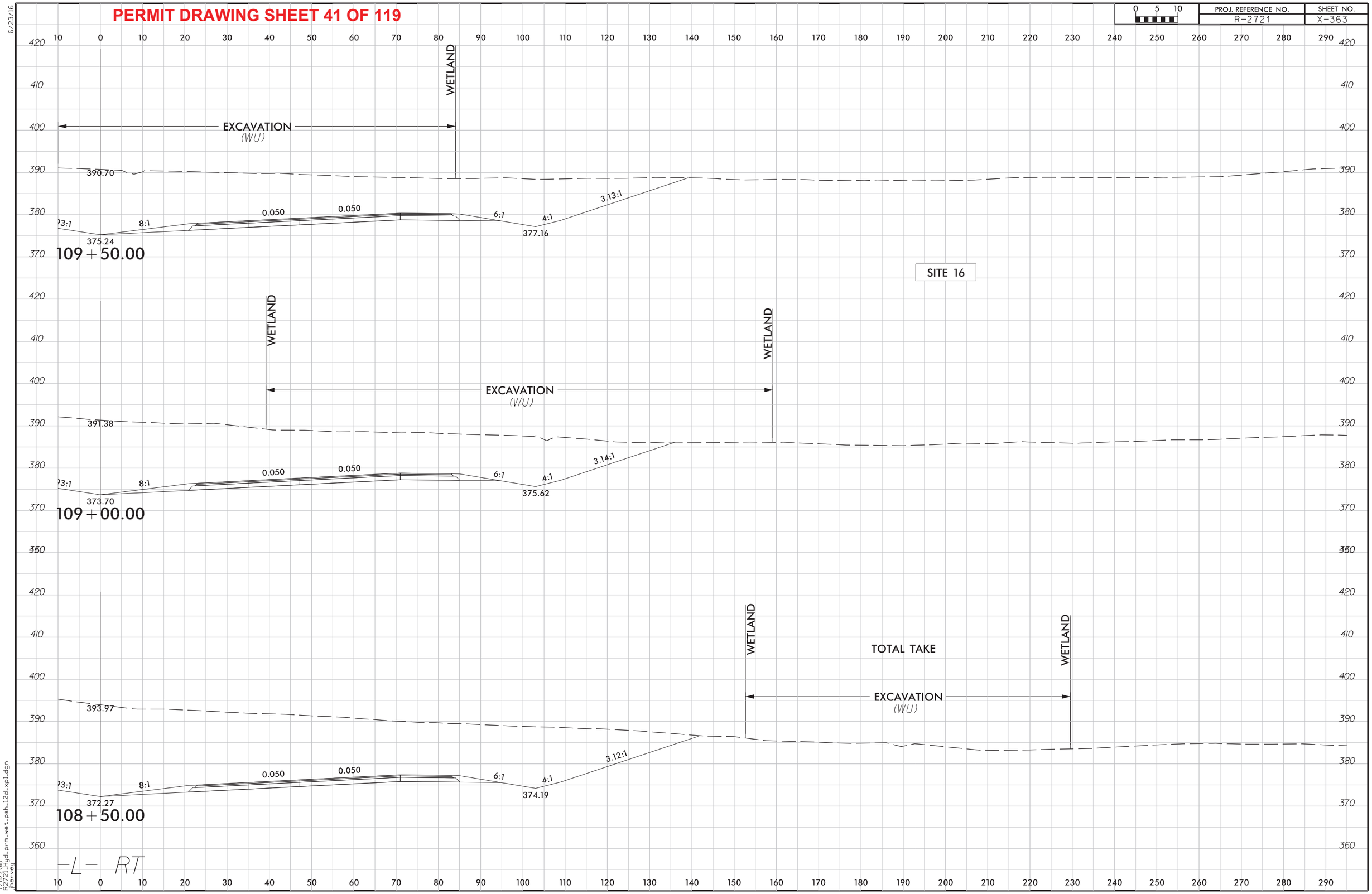

PERMIT DRAWING SHEET 40 OF 119
PROJ. REFERENCE NO.
R-2721
SHEET NO.
X-74
SITE 16
WETLAND
EXCAVATION
(WU)
3.05:1
4:1
6:1
373.55
0.050
0.050
6.593:1
390.70
375.24
109+50.00
3.03:1
4:1
6:1
372.30
0.050
0.050
6.593:1
391.38
373.70
109+00.00
-L- LT
6/23/16
7/8/2018
R2721_Hyd_prm_wet_psh_12c_xpl.dgn
jharvey

6/23/16

PERMIT DRAWING SHEET 41 OF 119

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2721	X-363

SITE 16



7/9/2018
R2721_lyd_prm_wet_psh_12d_xpl.dgn
jharvey

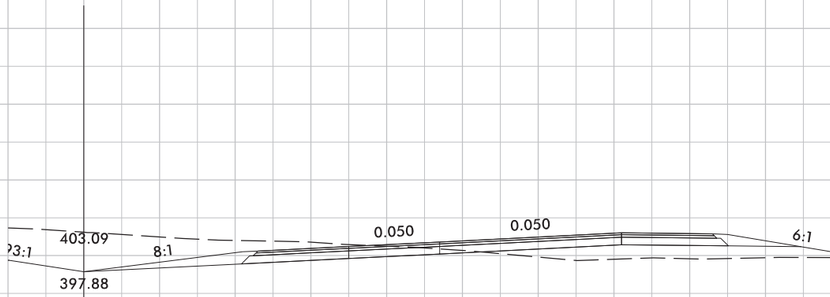
6/23/16

PERMIT DRAWING SHEET 42 OF 119

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2721	X-368

10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290

440 430 420 410 400 390 380



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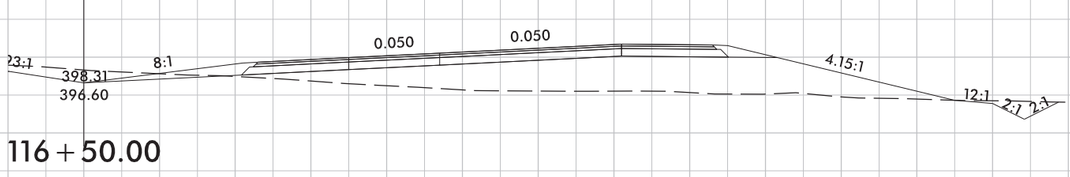

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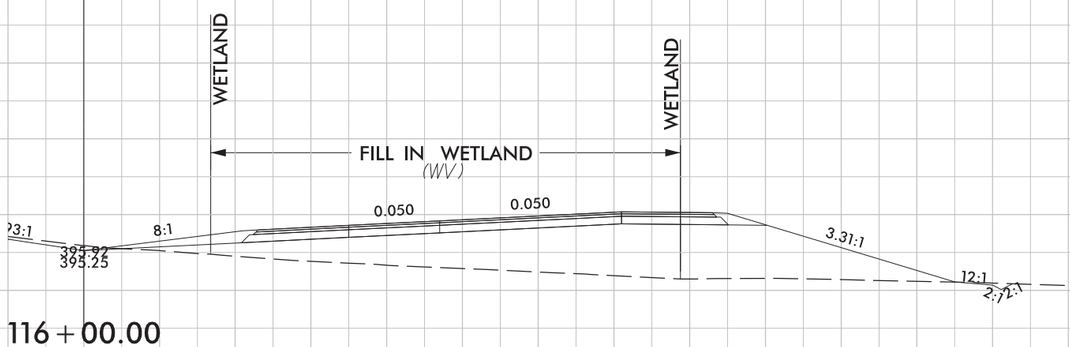
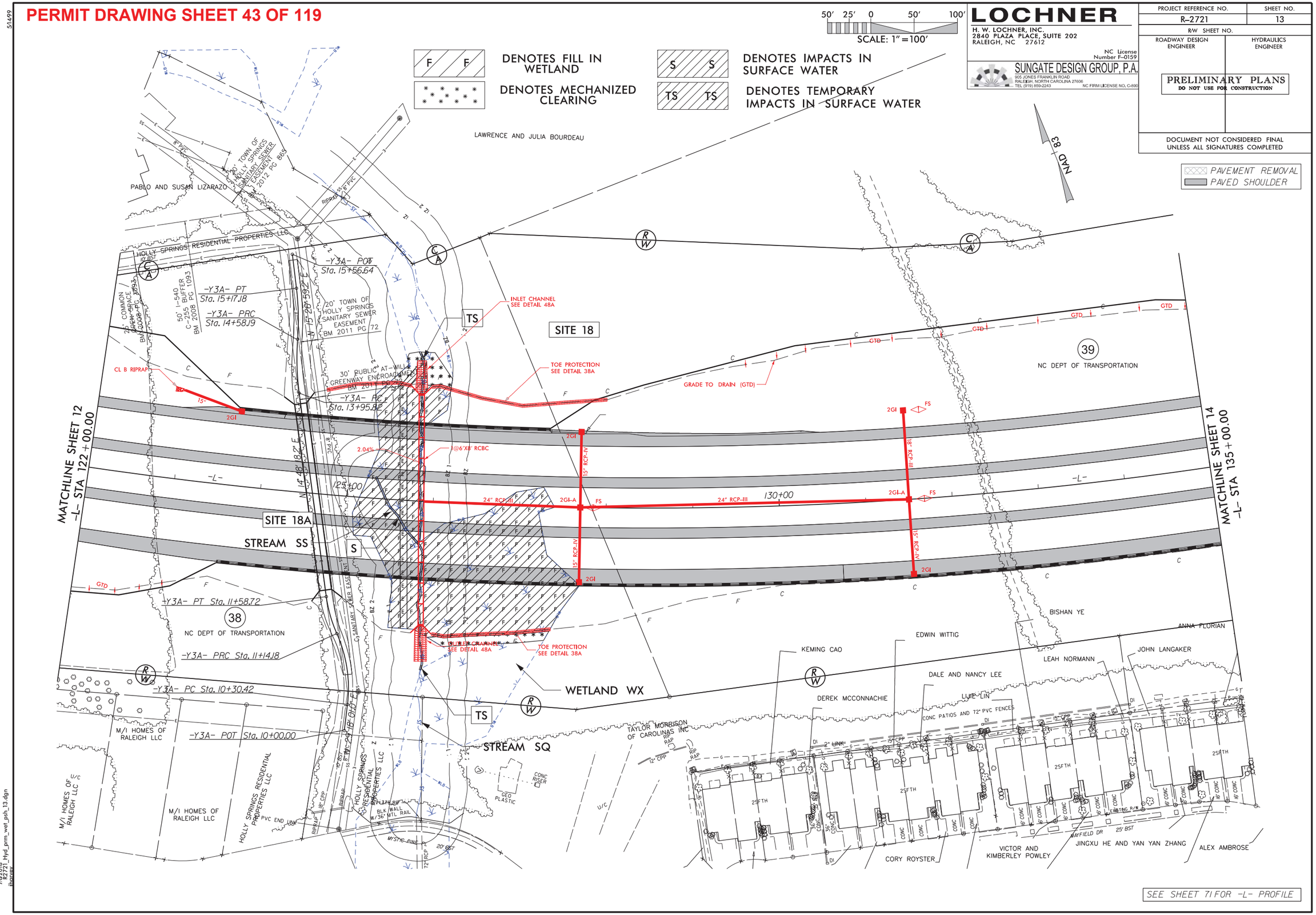


SITE 17

116 + 00.00

-L- RT

7/9/2018
R2721_grd_prm_wet_psh_12e_xpl.dgn
jharvey


PERMIT DRAWING SHEET 43 OF 119
50' 25' 0 50' 100'
SCALE: 1" = 100'
DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159
SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
NC FIRM LICENSE NO. C-890
PROJECT REFERENCE NO.
R-2721
SHEET NO.
13
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
PAVEMENT REMOVAL
PAVED SHOULDER
NAD 83
LAWRENCE AND JULIA BOURDEAU
PABLO AND SUSAN LIZARAZO
HOLLY SPRINGS RESIDENTIAL PROPERTIES LLC
20' TOWN OF HOLLY SPRINGS SANITARY SEWER EASEMENT BM 2012 PG 865
-Y3A- POT Sta. 15+56.64
-Y3A- PT Sta. 15+17.18
-Y3A- PRC Sta. 14+58.19
20' TOWN OF HOLLY SPRINGS SANITARY SEWER EASEMENT BM 2011 PG 72
30' PUBLIC AT-WILL GREENWAY ENCROACHMENT BM 2011 PG 72
-Y3A- PC Sta. 13+95.82
INLET CHANNEL SEE DETAIL 48A
TOE PROTECTION SEE DETAIL 38A
SITE 18
TS
GRADE TO DRAIN (GTD)
39
NC DEPT OF TRANSPORTATION
CL B RIPRAP
MATCHLINE SHEET 12 -L- STA 122+00.00
MATCHLINE SHEET 14 -L- STA 135+00.00
125+00
130+00
24" RCP-III
15" RCP-IV
18" RCP-III
SITE 18A
STREAM SS
S
-Y3A- PT Sta. 11+58.72
38
NC DEPT OF TRANSPORTATION
-Y3A- PRC Sta. 11+14.18
-Y3A- PC Sta. 10+30.42
-Y3A- POT Sta. 10+00.00
WETLAND WX
STREAM SQ
M/I HOMES OF RALEIGH LLC
HOLLY SPRINGS RESIDENTIAL PROPERTIES LLC
TAYLOR MORRISON OF CAROLINAS INC
KEMING CAO
EDWIN WITTIG
DALE AND NANCY LEE
DEREK MCCONNACHIE
LIJIE LIN
BISHAN YE
ANNA FLORIAN
LEAH NORMANN
JOHN LANGAKER
CONC PATIOS AND 72" PVC FENCES
CORY ROYSTER
VICTOR AND KIMBERLEY POWLEY
JINGXU HE AND YAN YAN ZHANG
ALEX AMBROSE
SEE SHEET 71 FOR -L- PROFILE

51499

PERMIT DRAWING SHEET 44 OF 119

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

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
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NC License Number F-0159

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 NC FIRM LICENSE NO. C-890

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT REMOVAL
PAVED SHOULDER

NAD 83

LAWRENCE AND JULIA BOURDEAU

PABLO AND SUSAN LIZARAZO

HOLLY SPRINGS RESIDENTIAL PROPERTIES LLC

20' TOWN OF HOLLY SPRINGS SANITARY SEWER EASEMENT BM 2012 PG 865

-Y3A- POB Sta. 15+56.64

-Y3A- PT Sta. 15+17.18

-Y3A- PRC Sta. 14+58.19

50' I-540 C 255 BUFFER BM 2008 PG 1083

COMMON OPEN SPACE BM 2008 PG 1083

20' TOWN OF HOLLY SPRINGS SANITARY SEWER EASEMENT BM 2011 PG 72

30' PUBLIC AT-WILL GREENWAY ENCROACHMENT BM 2011 PG 72

-Y3A- PC Sta. 13+95.82

TS

SITE 18

INLET CHANNEL SEE DETAIL 48A

TOE PROTECTION SEE DETAIL 38A

CL B RIPRAP

15"

2GI

2.04%

1@6'X3' RCBC

15" RCP-IV

24" RCP-III

2GI-A

FS

GRADE TO DRAIN (GTD)

39

NC DEPT OF TRANSPORTATION

MATCHLINE SHEET 12 -L- STA 122+00.00

MATCHLINE SHEET 14 -L- STA 135+00.00

125+00

130+00

SITE 18A

STREAM SS

S

-Y3A- PT Sta. 11+58.72

38

NC DEPT OF TRANSPORTATION

-Y3A- PRC Sta. 11+14.18

-Y3A- PC Sta. 10+30.42

-Y3A- POT Sta. 10+00.00

WETLAND WX

STREAM SQ

TS

M/I HOMES OF RALEIGH LLC

HOLLY SPRINGS RESIDENTIAL PROPERTIES LLC

BLK WALL W/36" MTL RAIL

MYSTIC PINE PL

72" RCP

20' BST

TAYLOR MORRISON OF CAROLINAS INC

KEMING CAO

DEREK MCCONNACHIE

EDWIN WITTIG

DALE AND NANCY LEE

LEAH NORMANN

JOHN LANGAKER

ANNA FLORIAN

BISHAN YE

LINE IN

CONC PATIOS AND 72" PVC FENCE

42" CPP

15" CPP

2' LINK

RIP RAP

25FTH

CORY ROYSTER

VICTOR AND KIMBERLEY POWLEY

JINGXU HE AND YAN YAN ZHANG

ALEX AMBROSE

MAYFIELD DR 25' BST

EXISTING R/W

SEE SHEET 71 FOR -L- PROFILE

7/8/2018
R2721_Hyd_prm_wet_psh_13a.dgn
lhoover

PERMIT DRAWING SHEET 45 OF 119

5/28/99

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159

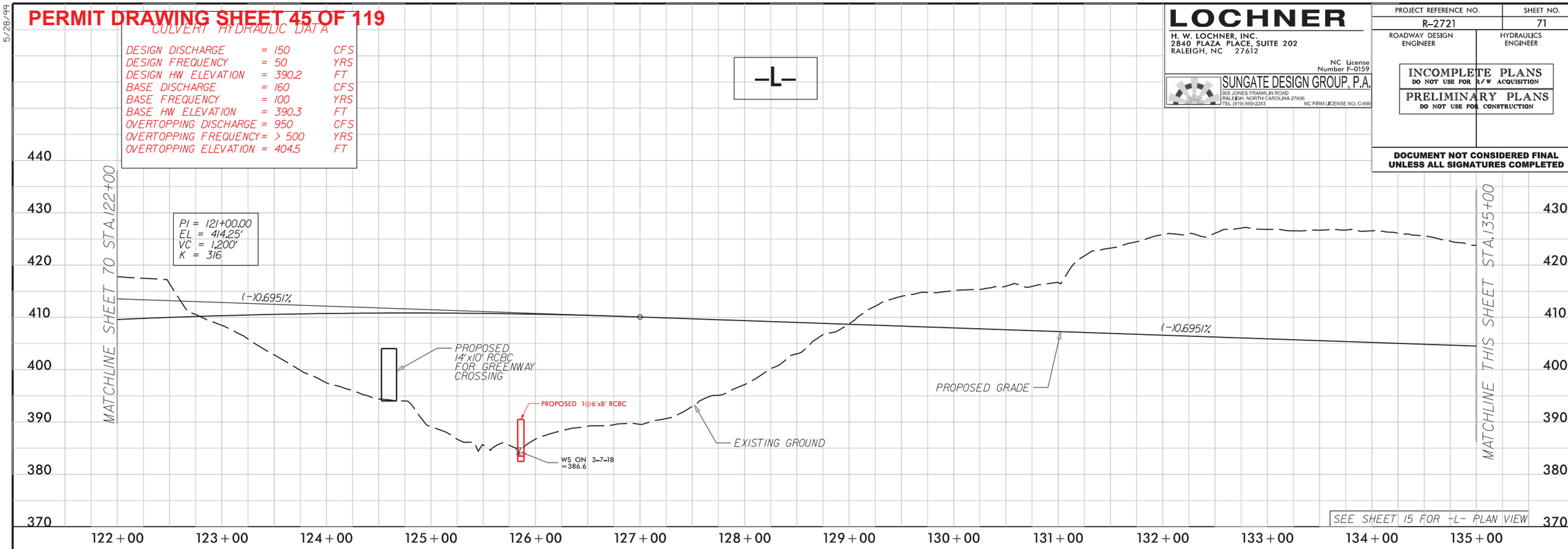
SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 NC FIRM LICENSE NO. C-890

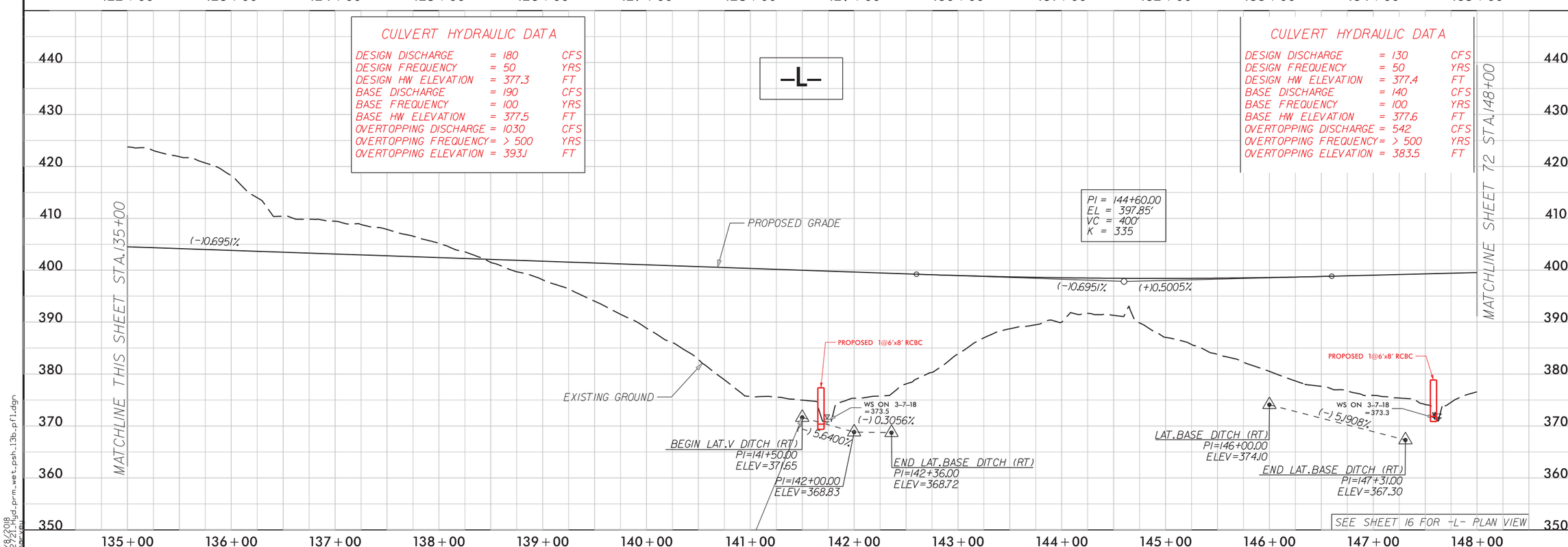
PROJECT REFERENCE NO.	SHEET NO.
R-2721	71
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





7/8/2018
R2721_Hyd_prm_wet_psh_13b_pfl.dgn
jharvey

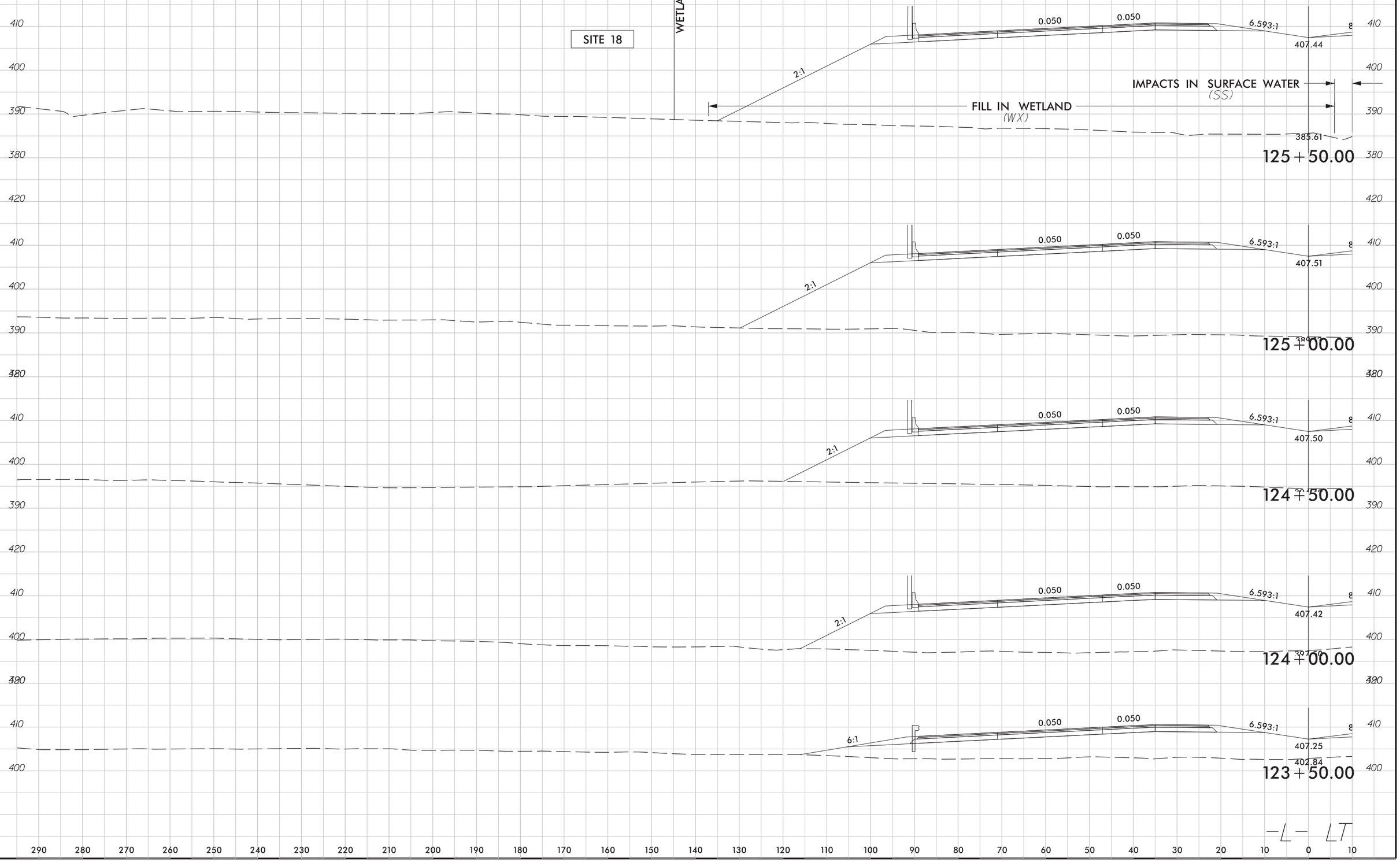
6/23/16

PERMIT DRAWING SHEET 46 OF 119

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2721	X-83

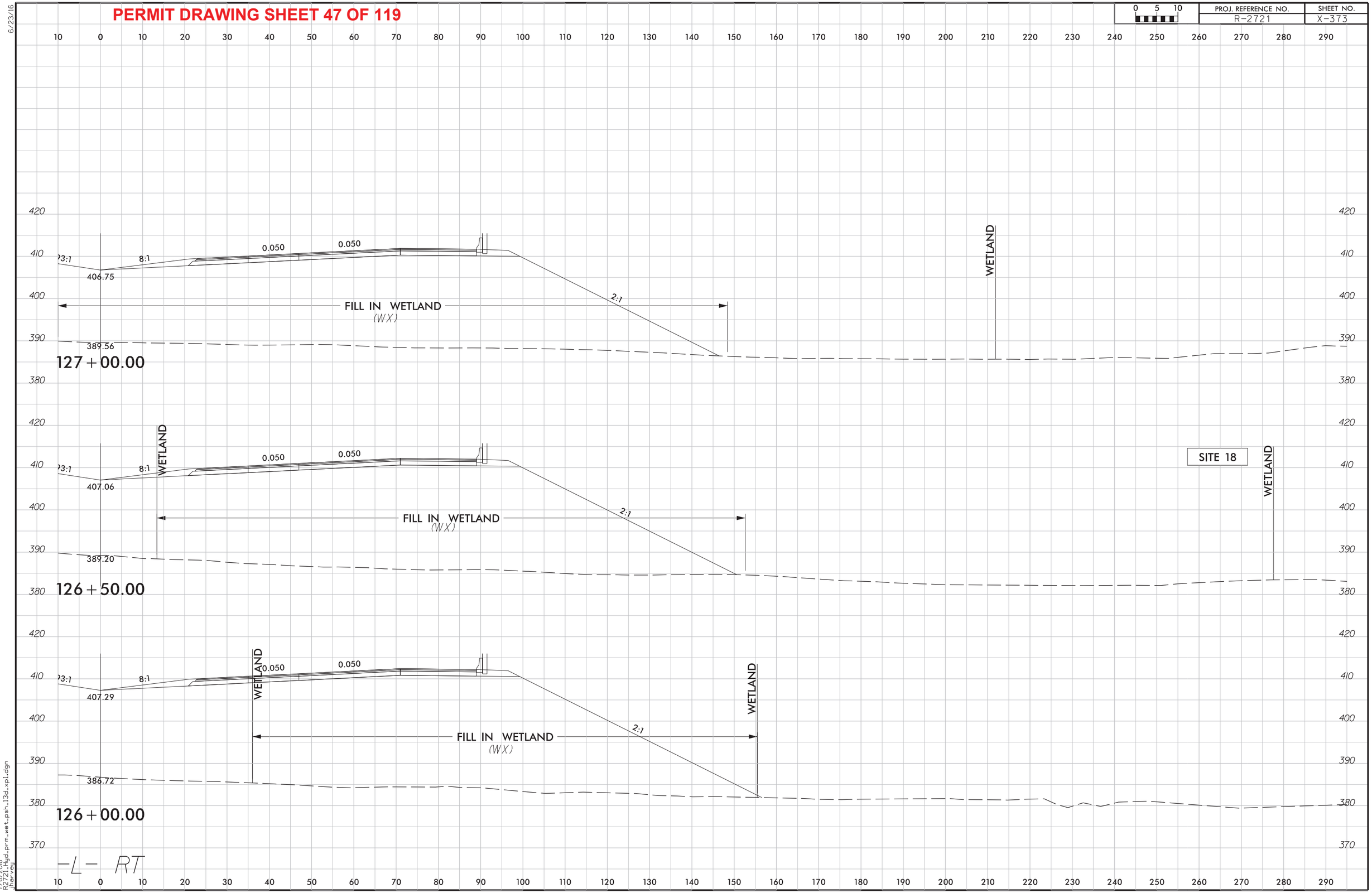
SITE 18

WETLAND



7/18/2018
R2721_hyd_prm_wet_psh_13c_xpl.dgn
jharvey

PROJ. REFERENCE NO.	SHEET NO.
R-2721	X-373



6/23/16

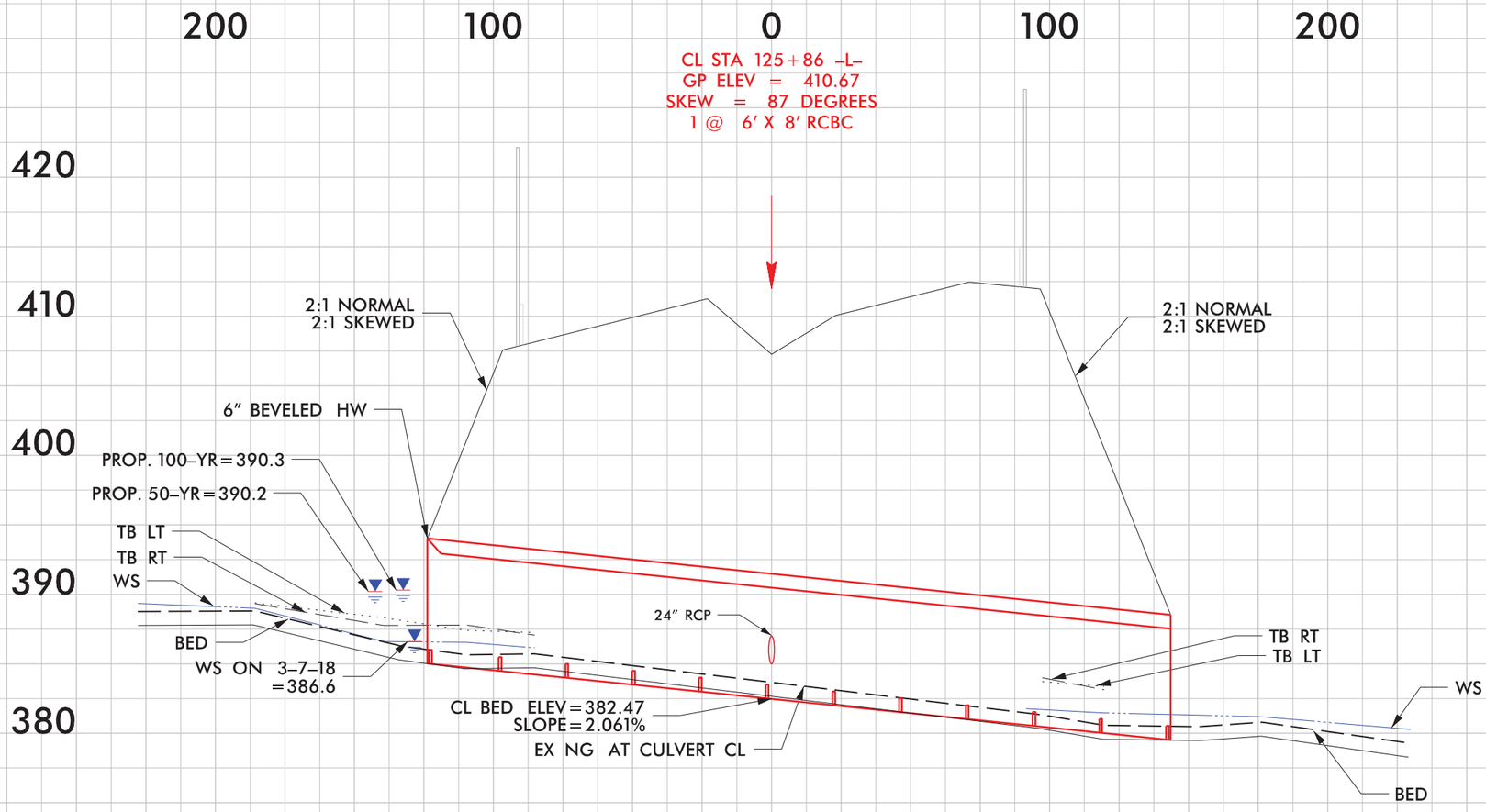
7/8/2018
R2721_Hyd_prm_wet_psh_13d_xpl.dgn
jharvey

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

7/8/2018
R2721_Hyd_prm_wet_psh_13e_sec.dgn
jbarvey

51499

PERMIT DRAWING SHEET 49 OF 119

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

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
NC FIRM LICENSE NO. C-890

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

HOLLY SPRINGS RESIDENTIAL PROPERTIES LLC

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

PAVEMENT REMOVAL
PAVED SHOULDER

NAD 83

MATCHLINE SHEET 13 -L- STA 122+00.00

MATCHLINE SHEET 15 -L- STA 148+00.00

WALLACE FARRINGTON

8" DIP

NEW BOSS ROAD

WETLAND WY

40 NATALIE AND THOMAS BROOKS

43 BENJAMIN MCDONALD

STREAM SV

WETLAND WZ

SITE 20

INLET CHANNEL SEE DETAIL 50A

BEGIN FENCE +90.49 -L- 127.47' LT

END FENCE +65.46 -L- 127.39' LT

INLET CHANNEL SEE DETAIL 49A

39 NC DEPT OF TRANSPORTATION

SITE 19

END FENCE +91.85 -L- 130.94' LT

BEGIN FENCE +19.33 -L- 130.83' LT

TOE PROTECTION SEE DETAIL 38A

WILLIAM AND BERTHA TURNER

44

STREAM ST

1@6'X8' RCBC

1.63%

1.47%

WILLIAM GRIFFIN

45

140+00

145+00

18" RCP-III

30" RCP-III

15" RCP-III

15" RCP-IV

24" RCP-III

2GI

2GI-A

FS

SINGLE FACE BARRIER

JAMES TURNER AND WILLIAM TURNER

46

24" W
2 ELBOWS

30" W
2 ELBOWS

TOE PROTECTION SEE DETAIL 38A

LAT 3' BASE DITCH w/CL B RIPRAP SEE DETAIL 10A

OUTLET CHANNEL SEE DETAIL 49A

41 NC DEPT OF TRANSPORTATION

LAT 3' BASE DITCH w/CL B RIPRAP SEE DETAIL 50A

SITE 21

OUTLET CHANNEL SEE DETAIL 50A

47 H&B STEPHENSON FAMILY LLC

60' PRIVATE ROAD EASEMENT BM 1981 PG 1000

BRIDGET GWALTNEY

TAYLOR MORRISON OF CAROLINAS INC

DIANE COX

ALLISON AND STEVEN HARRIS

WOODCREEK NEIGHBORHOOD ASSN INC

HOLLY SPRINGS RESIDENTIAL PROPERTIES LLC

ERIN KAMM

MATTHEW AND HEATHER JONES

TIMOTHY REINHARDT AND APRIL SMITH

BASKETBALL

TENNIS COURTS

PLAY GROUND

SEE SHEET 71 FOR -L- PROFILE

7/8/2018
R2721_Hyd_prm_wet_psh_14.dgn
lhorzey

51499

PERMIT DRAWING SHEET 50 OF 119

50′ 25′ 0 50′ 100′
SCALE: 1″=100′

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 NC FIRM LICENSE NO. C-890

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

PAVEMENT REMOVAL
PAVED SHOULDER

NAD 83

HOLLY SPRINGS RESIDENTIAL PROPERTIES LLC
WALLACE FARRINGTON
NATALIE AND THOMAS BROOKS
BRIDGET GWALTNEY
TAYLOR MORRISON OF CAROLINAS INC
WOODCREEK NEIGHBORHOOD ASSN INC
HOLLY SPRINGS RESIDENTIAL PROPERTIES LLC
NC DEPT OF TRANSPORTATION
MATTHEW AND HEATHER JONES
TIMOTHY REINHARDT AND APRIL SMITH
60' PRIVATE ROAD EASEMENT BM 1981 PG 1000

WETLAND WY
WETLAND WZ
STREAM ST
STREAM SV
SITE 19
SITE 20
SITE 21

MATCHLINE SHEET 13 -L- STA 122+00.00
MATCHLINE SHEET 15 -L- STA 148+00.00

1@6'X8' RCBC
18" RCP-III
30" RCP-III
15" RCP-IV
24" RCP-III
24" W/ 2 ELBOWS
30" W/ 2 ELBOWS
TOE PROTECTION SEE DETAIL 38A
LAT 3' BASE DITCH w/CL B RIPRAP SEE DETAIL 10A
LAT 3' BASE DITCH w/CL B RIPRAP SEE DETAIL 5A
BEGIN FENCE +19.33 -L- 130.83' LT
END FENCE +91.85 -L- 139.94' LT
BEGIN FENCE +50.40 -L- 127.47' LT
END FENCE +69.46 -L- 127.39' LT
SINGLE FACE BARRIER

SEE SHEET 71 FOR -L- PROFILE

6/12/2018
R2721_Hyd_prm_wet_psh_14a.dgn
jbarkley

6/23/16

PERMIT DRAWING SHEET 51 OF 119

PROJ. REFERENCE NO.	SHEET NO.
R-2721	X-91

0 5 10

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

410 400 390 380 370

SITE 19

WETLAND

WETLAND

FILL IN WETLAND

397.5 0.050 0.050 6.590:1 8

396.67

SITE 19

IMPACTS IN SURFACE WATER (ST)

374.98

141+50.00

397.8 0.050 0.050 6.590:1 8

397.02

375.68

141+00.00

398.2 0.050 0.050 6.590:1 8

397.37

382.79

140+50.00

0.050 0.050 6.593:1 8

3.03:1

397.72

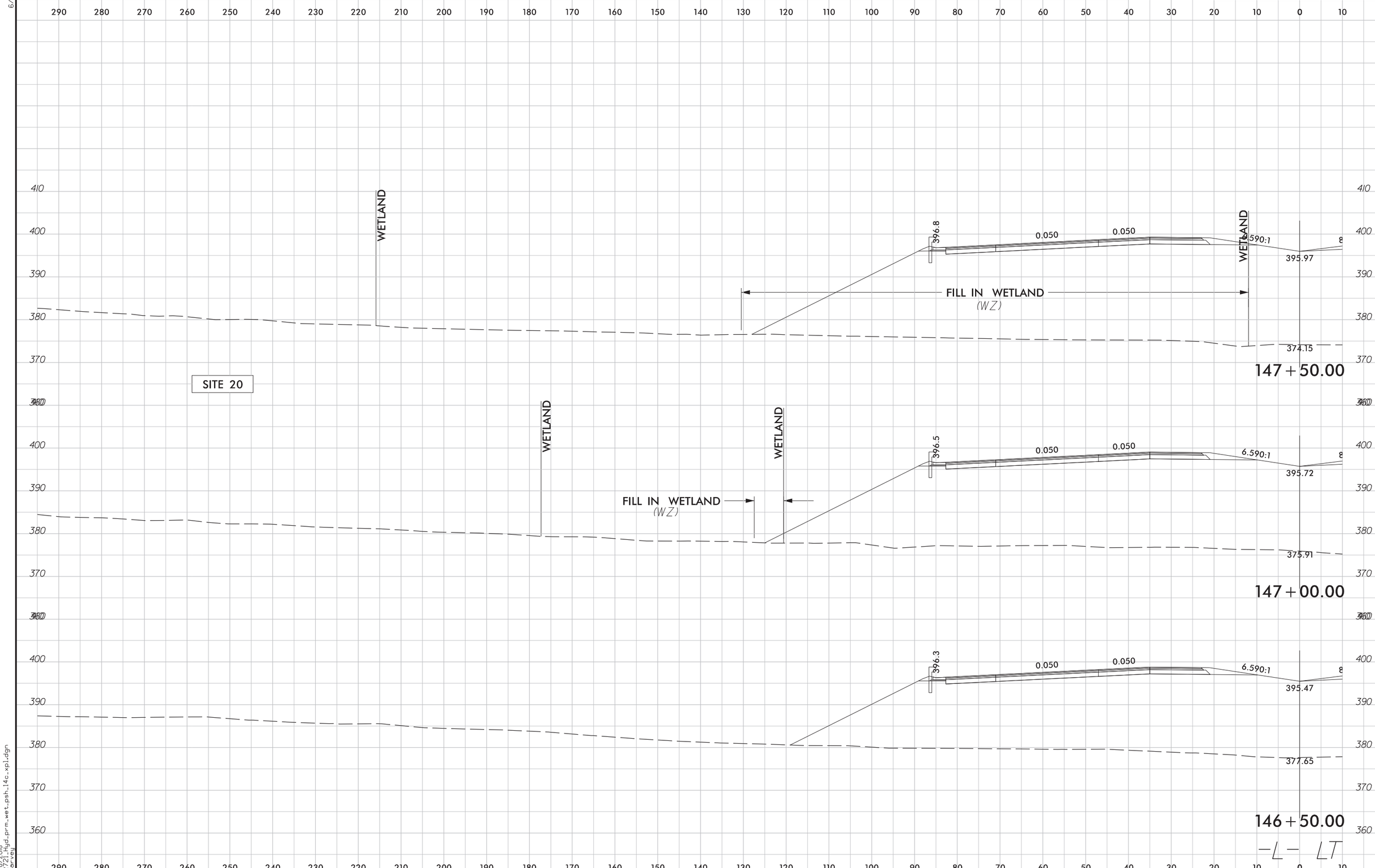
388.84

140+00.00

-L- LT

7/8/2018
R-2721_Hyd_prm_wet_psh_14b_xpl.dgn
jharvey

PROJ. REFERENCE NO.	SHEET NO.
R-2721	X-95



6/23/16

7/8/2018
R2721_Hyd_prm_wet_psh_14c_xpl.dgn
jharvey

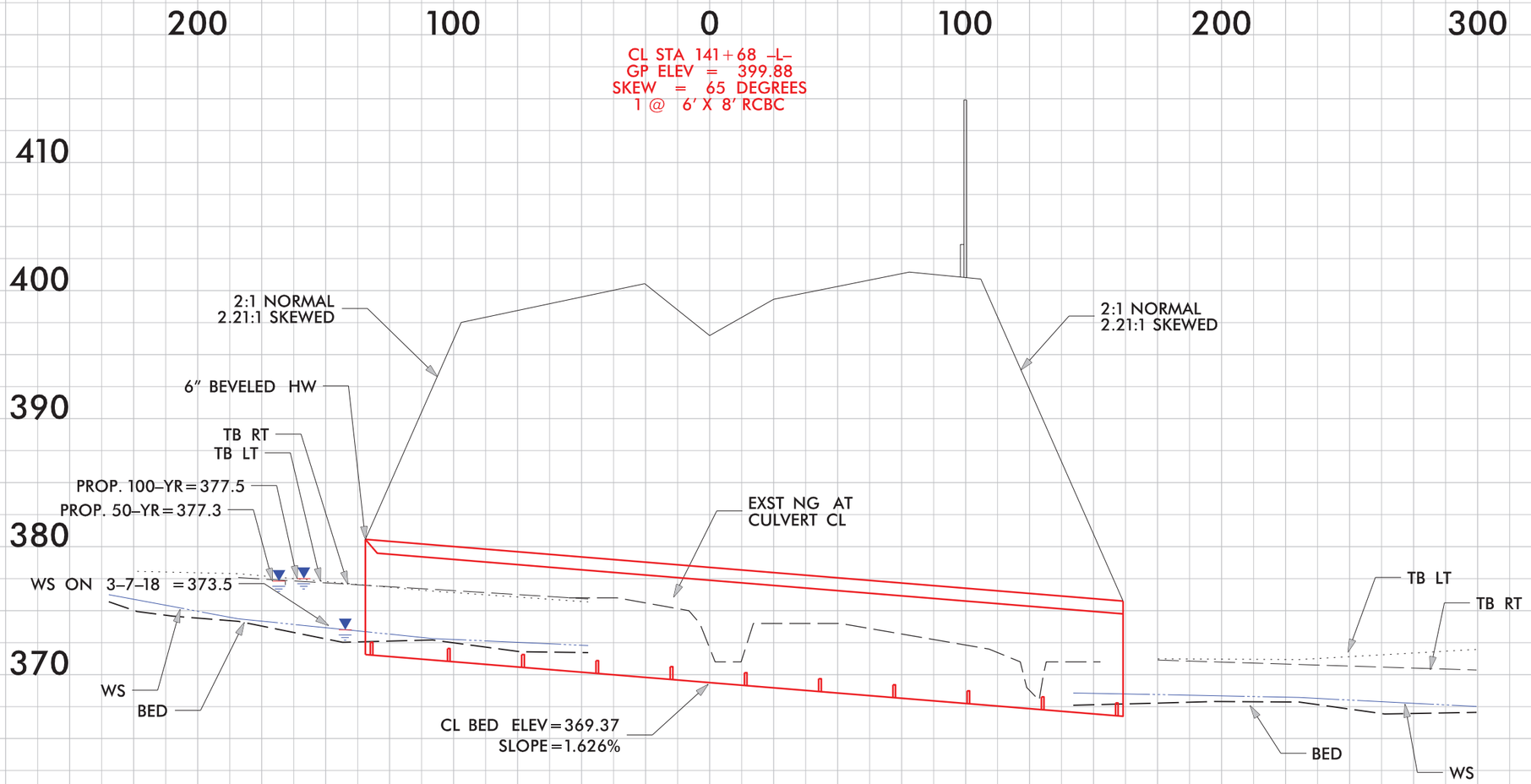
5/14/99

PERMIT DRAWING SHEET 53 OF 119

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

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



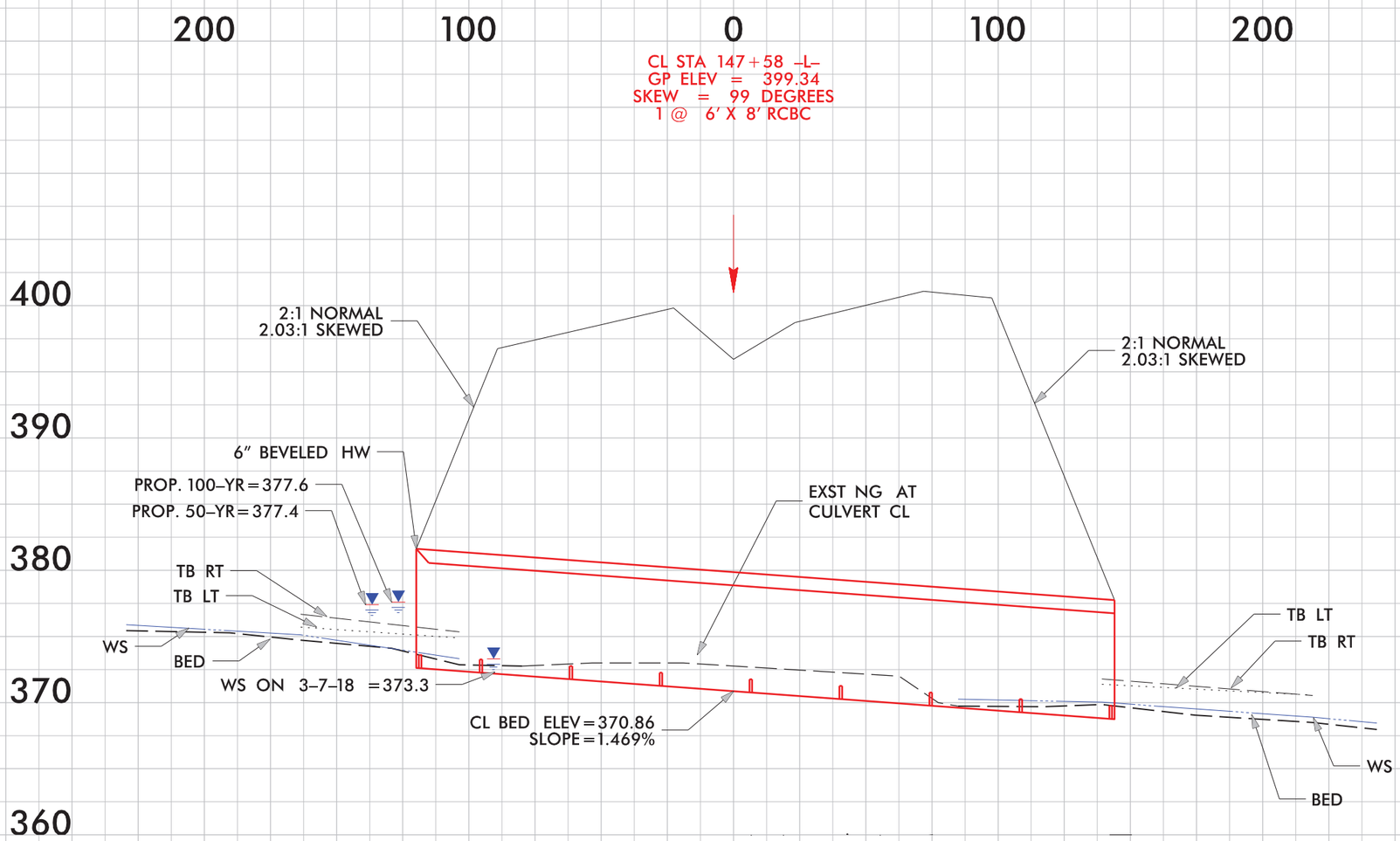
7/8/2018
R2721_hyd_prm_wet_psh_14d_sec.dgn
hgravel

PERMIT DRAWING SHEET 54 OF 119

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

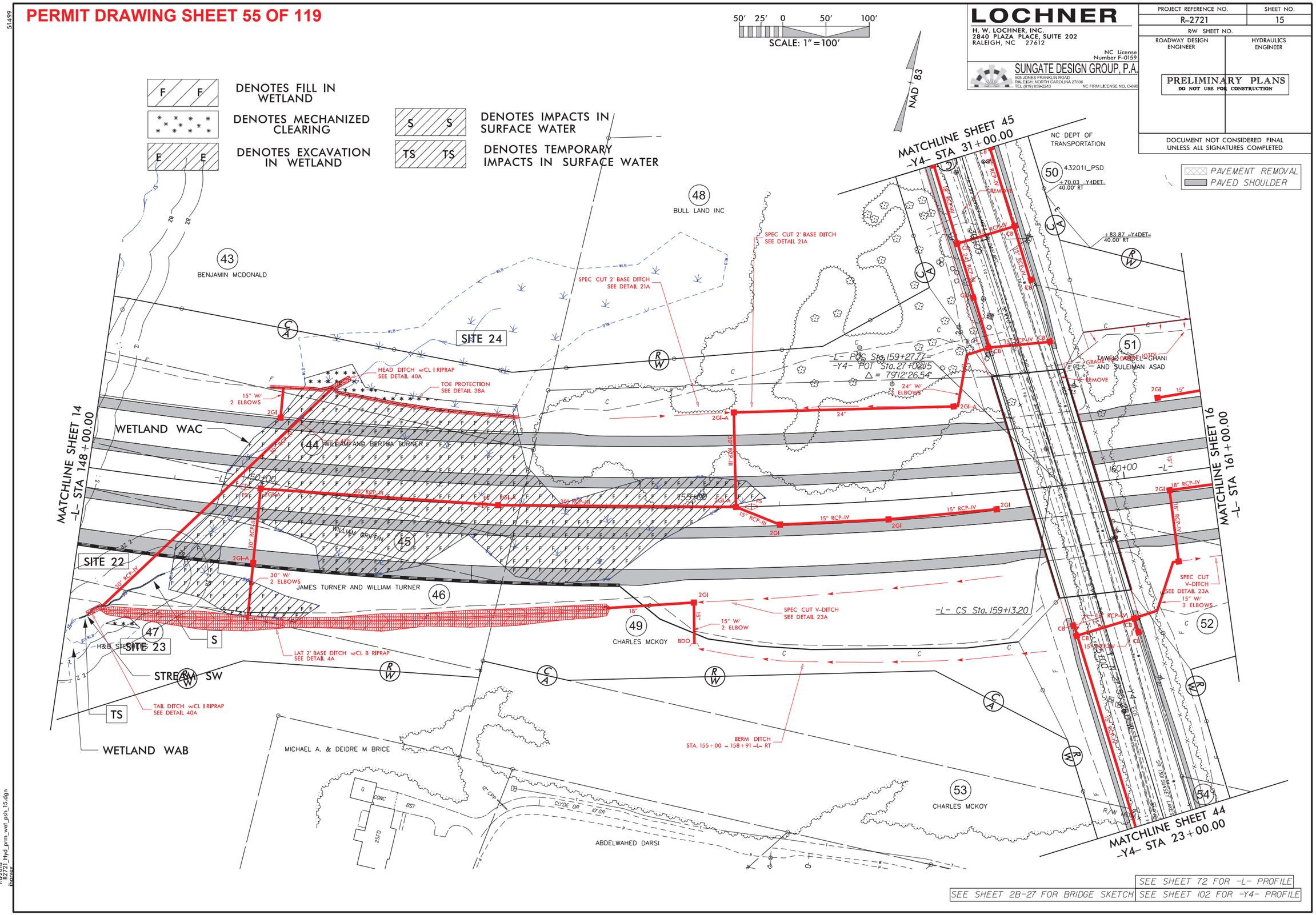
INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



5/14/99

7/8/2018
R2721_Hyd_prm_wet_psh_14e_sec.dgn
jharvey


PERMIT DRAWING SHEET 55 OF 119
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159
SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
NC FIRM LICENSE NO. C-890
PROJECT REFERENCE NO.
R-2721
SHEET NO.
15
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
SCALE: 1"=100'
DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
DENOTES EXCAVATION IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
PAVEMENT REMOVAL
PAVED SHOULDER
NAD 83
MATCHLINE SHEET 45 -Y4- STA 31+00.00
MATCHLINE SHEET 14 -L- STA 148+00.00
MATCHLINE SHEET 16 -L- STA 161+00.00
MATCHLINE SHEET 44 -Y4- STA 23+00.00
NC DEPT OF TRANSPORTATION
43 BENJAMIN MCDONALD
48 BULL LAND INC
50 432011_PSD
51 TAWFIQ ABDEL-GHANI AND SULEIMAN ASAD
52
53 CHARLES MCKOY
54
44 WILLIAM AND BERTHA TURNER
45 WILLIAM GRIFFIN
46 JAMES TURNER AND WILLIAM TURNER
47 H&B STEEL INC
49 CHARLES MCKOY
SITE 24
SITE 22
SITE 23
WETLAND WAC
WETLAND WAB
STREAM SW
MICHAEL A. & DEIDRE M BRICE
ABDELWAHED DARSI
-L- POC Sta. 159+27.77
-Y4- POT Sta. 27+02.15
Δ = 79°12'26.54"
-L- CS Sta. 159+13.20
SPEC CUT 2' BASE DITCH SEE DETAIL 21A
HEAD DITCH w/CL I RIPRAP SEE DETAIL 40A
TOE PROTECTION SEE DETAIL 38A
LAT 2' BASE DITCH w/CL B RIPRAP SEE DETAIL 4A
TAIL DITCH w/CL I RIPRAP SEE DETAIL 40A
SPEC CUT V-DITCH SEE DETAIL 23A
BERM DITCH STA. 155+00 - 158+91 -L- RT
15" W/ 2 ELBOWS
30" W/ 2 ELBOWS
15" W/ 2 ELBOW
15" W/ 3 ELBOWS
24" W/ ELBOWS
30" RCP-III
30" RCP-IV
15" RCP-III
15" RCP-IV
18" RCP-IV
2GI
2GI-A
CB
BDO
SR 1301 SUNSET LAKES
SEE SHEET 72 FOR -L- PROFILE
SEE SHEET 2B-27 FOR BRIDGE SKETCH
SEE SHEET 102 FOR -Y4- PROFILE
7/8/2018
R2721_Hyd_prm_wet_psh_15.dgn
jharvey

PERMIT DRAWING SHEET 56 OF 119

51499

50′ 25′ 0 50′ 100′
SCALE: 1″=100′

NAD 83

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
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NC License Number F-0159

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
NC FIRM LICENSE NO. C-890

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

PAVEMENT REMOVAL
PAVED SHOULDER

MATCHLINE SHEET 45
-Y4- STA 31+00.00

NC DEPT OF TRANSPORTATION
50 43201_PSD
70.00 -Y4DET- 40.00' RT
83.87 -Y4DET- 40.00' RT

48 BULL LAND INC

43 BENJAMIN MCDONALD

SITE 24

SPEC CUT 2' BASE DITCH SEE DETAIL 21A

HEAD DITCH wCL I RIPRAP SEE DETAIL 40A

TOE PROTECTION SEE DETAIL 38A

-L- PC Sta 159+27.72
-Y4- POT Sta 27+02.15
Δ = 7912°26.54"

24" W/ ELBOWS

15" W/ 2 ELBOWS

51 TAWFIQ DARDEL (LIFE) AND SULEIMAN ASAD

GRADE & REMOVE

MATCHLINE SHEET 14
-L- STA 148+00.00

WETLAND WAC

44 WILLIAM AND BERTHA TURNER

-L- 150+00

-L- 155+00

30" RCP-III

35" RCP-III

15" RCP-III

15" RCP-IV

18" RCP-IV

WILLIAM GRIFFIN 45

SITE 22

30" W/ 2 ELBOWS

JAMES TURNER AND WILLIAM TURNER 46

47 H&B STEPHENS

SITE 23

S

LAT 2' BASE DITCH wCL B RIPRAP SEE DETAIL 4A

STREAM SW

TS

TAIL DITCH wCL I RIPRAP SEE DETAIL 40A

WETLAND WAB

49 CHARLES MCKOY

-L- CS Sta. 159+13.20

SPEC CUT V-DITCH SEE DETAIL 23A

15" W/ 2 ELBOW

MICHAEL A. & DEIDRE M BRICE

BERM DITCH STA. 153+00 – 158+91 -L- RT

-L- 160+00

SPEC CUT V-DITCH SEE DETAIL 23A 15" W/ 3 ELBOWS

52

53 CHARLES MCKOY

54

SR 1501 SUNSET LAKE RD

ABDELWAHED DARSI

MATCHLINE SHEET 16
-L- STA 161+00.00

MATCHLINE SHEET 44
-Y4- STA 23+00.00

SEE SHEET 72 FOR -L- PROFILE
SEE SHEET 2B-27 FOR BRIDGE SKETCH | SEE SHEET 102 FOR -Y4- PROFILE

7B2018_R2721_hyd_prm_wet_psh_15a.dgn
thornley

PERMIT DRAWING SHEET 57 OF 119

5/28/99

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159

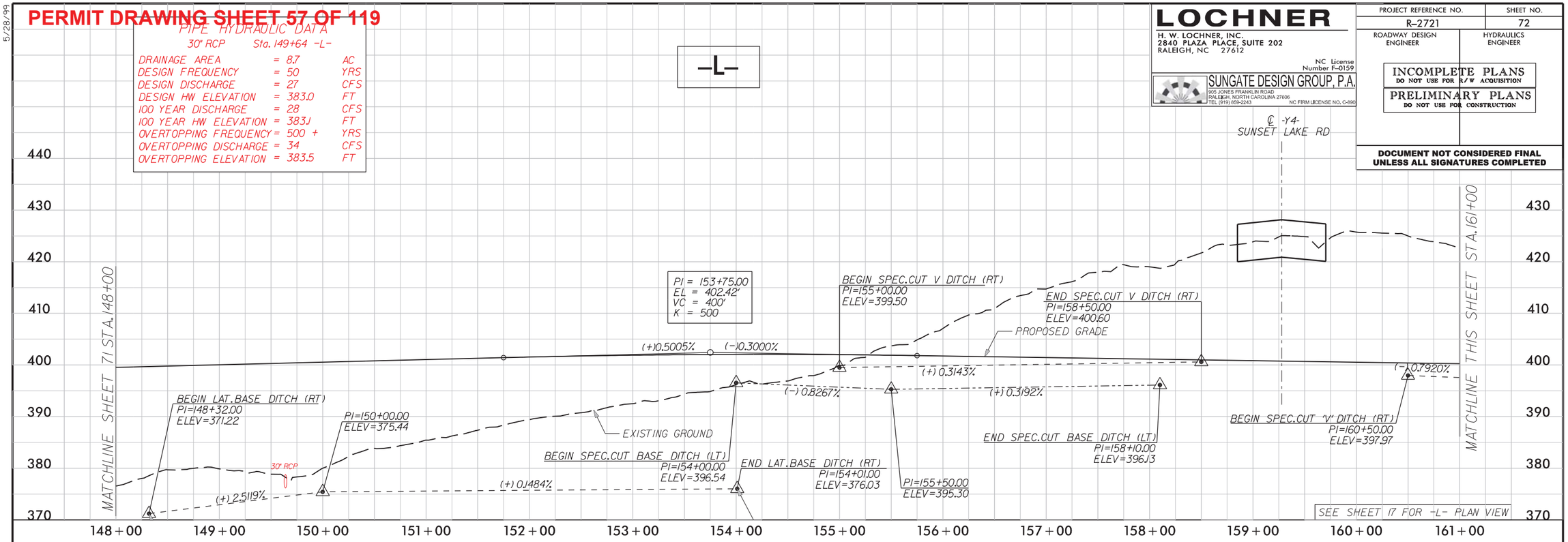
SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 NC FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
R-2721	72
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



7/8/2018
R2721_Hyd_prm_wet_psh_15b_pfl.dgn
jbarvey

6/23/16

PERMIT DRAWING SHEET 58 OF 119

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2721	X-97

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

410 400 390 380

WETLAND

398.82 0.050 0.050 6.590:1 8

FILL IN WETLAND (WAC)

397.97

387.37

151 + 50.00

WETLAND

398.57 0.050 0.050 6.590:1 8

FILL IN WETLAND (WAC)

397.72

385.44

151 + 00.00

SITE 24

WETLAND

398.3 0.050 0.050 6.590:1 8

FILL IN WETLAND (WAC)

397.47

383.86

150 + 50.00

WETLAND

398.0 0.050 0.050 6.590:1 8

FILL IN WETLAND (WAC)

397.22

380.00

150 + 00.00

410 400 390 380 370

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

-L- LT

7/9/2018
R-2721_Hyd_prm_wet_psh_15c_xpl.dgn
jharvey

6/23/16

PERMIT DRAWING SHEET 59 OF 119

PROJ. REFERENCE NO.	SHEET NO.
R-2721	X-386

0 5 10

10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290

410 400 390 380

WETLAND

0.050 0.050

20:1 8:1

398.22

FILL IN WETLAND
(WAC)

389.41

2:1

152 + 00.00

WETLAND

0.050 0.050

20:1 8:1

397.97

FILL IN WETLAND

387.37

2:1

151 + 50.00

SITE 24

WETLAND

0.050 0.050

20:1 8:1

397.72

FILL IN WETLAND
(WAC)

385.44

2:1

151 + 00.00

WETLAND WETLAND WETLAND

0.050 0.050

20:1 8:1

397.47

FILL IN WETLAND
(WAC)

383.86

FILL IN WETLAND
(WAC)

EXCAVATION
(WAC)

2:1

150 + 50.00

-L- RT

7/9/2018
R2721_Hyd_prm_wet_psh_15d_xpl.dgn
jharvey

51499

PERMIT DRAWING SHEET 60 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'

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
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NC License Number F-0159

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 NC FIRM LICENSE NO. C-890

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT REMOVAL
PAVED SHOULDER

NAD 83

2SFD DARREN AND KIMBERLY ANDRUS

2SFD JENNIFER WARD AND JENNIFER REEVES

56 WILL PIERSON & KAYLEE JAKUBOWSKI

55 CDP LEASING INC

50 NC DEPT OF TRANSPORTATION

57 SYLVIA SAMS

STREAM SX

WETLAND WAE

WETLAND WAF

SITE 25

SITE 26

SITE 27

SITE 28

SITE 29

TAWFIQ ABDEL-GHANI AND SULEIMAN ASAD

51 TAWFIQ ABDEL-GHANI AND SULEIMAN ASAD

52 TAWFIQ ABDEL-GHANI AND SULEIMAN ASAD

POND PB

-L- ST Sta. 162+33.20

-L- TS Sta. 166+45.42

-L- SC Sta. 170+45.42

-Y5RPC- SC Sta. 12+16.00

-Y5RPC- ST Sta. 10+00.00

-L- TS Sta. 166+45.42

MATCHLINE SHEET 15 -L- STA 161+00.00

MATCHLINE SHEET 17 -L- STA 174+00.00

MATCHLINE SHEET 44

INLET CHANNEL SEE DETAIL 52A

OUTLET CHANNEL SEE DETAIL 52A

TOE PROTECTION SEE DETAIL 38A

CL B RIPRAP

CL I RIPRAP

SPEC CUT V-DITCH SEE DETAIL 23A

DAYLIGHT DITCH

LAT 2' BASE DITCH w/CL B RIPRAP SEE DETAIL 10A

GRADE TO DRAIN (GTD)

2-20'W x 8' RCBC

18" RCP-III

24" RCP-III

30" RCP-III

36" RCP-IV

24" RCP-IV

15" RCP-IV

18" RCP-IV

15" RCP-IV

36" W/ 2 ELBOWS

15" W/ 2 ELBOWS

15" RW ELBOWS

JB YARD

END FENCE +04.71 -L- 160.33' RT

BEGIN FENCE +88.99 -L- 161.03' RT

71.00' RT

N 70°50'46.5"E

N 61°08'13" W 371.82'

S 88°16'00" E 544.39'

N 88°41'05" W 1834.71'

S 88°20'12" E 1685.99'

S 88°19'02" E 904.75'

N 51°51'57" E 228.88'

S 86°46'16" E 76.32'

S 88°17'03" E 88.11'

S 88°14'25" E 76.18'

S 88°15'26" E 143.63'

N 54°44'45" E 104.25'

S 23°32'10" W 165.55'

S 27°39'41" E 117.70'

S 87°39'41" E 117.70'

15+00

165+00

170+00

RUINS

RIPRAP

2GI

2GI-A

FS

S

TS

RW

CA

51499

PERMIT DRAWING SHEET 61 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'

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 NC FIRM LICENSE NO. C-890

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT REMOVAL
PAVED SHOULDER

NAD 83

2SFD DARREN AND KIMBERLY ANDRUS

2SFD JENNIFER WARD AND JENNIFER REEVES

56 WILL PIERSON & KAYLEE JAKUBOWSKI

55 CDP LEASING INC

57 SYLVIA SAMS

50 NC DEPT OF TRANSPORTATION

51 TAWFIQ ABDEL-GHANI AND SULEIMAN ASAD

52 TAWFIQ ABDEL-GHANI AND SULEIMAN ASAD

DETAIL 52A
EXHIBIT & OUTLET CHANNEL STABILIZATION
(Not to Scale)

STREAM SX

WETLAND WAE

WETLAND WAF

SITE 25

SITE 26

SITE 27

SITE 28

SITE 29

POND PB

-L- ST Sta. 162+33.20

-L- TS Sta. 166+45.42

-L- SC Sta. 170+45.42

-Y5RPC- SC Sta. 12+16.00

-Y5RPC- ST Sta. 10+00.00
71.00' RT

-L- TOT Sta. 166+45.42

INLET CHANNEL SEE DETAIL 52A

TOE PROTECTION SEE DETAIL 38A

CL B RIPRAP

GRADE TO DRAIN (GTD)

DAYLIGHT DITCH

LAT 2' BASE DITCH w/CL B RIPRAP SEE DETAIL 10A

SPEC CUT V-DITCH SEE DETAIL 23A

OUTLET CHANNEL SEE DETAIL 52A

END FENCE
-L- 104.71
160.33' RT

BEGIN FENCE
-L- 21.99
161.03' RT

MATCHLINE SHEET 15
-L- STA 161+00.00

MATCHLINE SHEET 17
-L- STA 174+00.00

MATCHLINE SHEET 44

6/23/16

PERMIT DRAWING SHEET 62 OF 119

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2721	X-105

SITE 26

WETLAND

0.007 0.020 7.996:1 8

2:1

396.39

FILL IN WETLAND
(WAE)

371.06

167+00.00

0.001 0.020 8:1 8

2:1

396.15

WETLAND WETLAND

FILL IN WETLAND
(WAE)

382.69

166+50.00

0.006 0.020 7.997:1 8

6:1

395.99

392.06

166+00.00

0.012 0.020 8:1 8

3.33:1 4:1 6:1

397.47

395.38 395.91

165+50.00

—L— LT

7/9/2018
R2721_hyd_prm_wet_psh_16b_xpl.dgn
jharvey

6/23/16

PERMIT DRAWING SHEET 63 OF 119

PROJ. REFERENCE NO.	SHEET NO.
R-2721	X-394

0 5 10

10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290

410 400 390 380 370 360

0.011 | 8:1 | 0.019 | 0.029 | 0.043

396.90

WETLAND

WETLAND

2:1

FILL IN WETLAND
(WAE)

371.95

168 + 00.00

SITE 26

0.013 | 8:1 | 0.023

396.64

WETLAND

WETLAND

2:1

FILL IN WETLAND
(WAE)

WETLAND

FILL IN WETLAND
(WAE)

371.39

167 + 50.00

0.007 | 8:1 | 0.020

396.39

WETLAND

2:1

FILL IN WETLAND
(WAE)

371.06

167 + 00.00

-L- RT

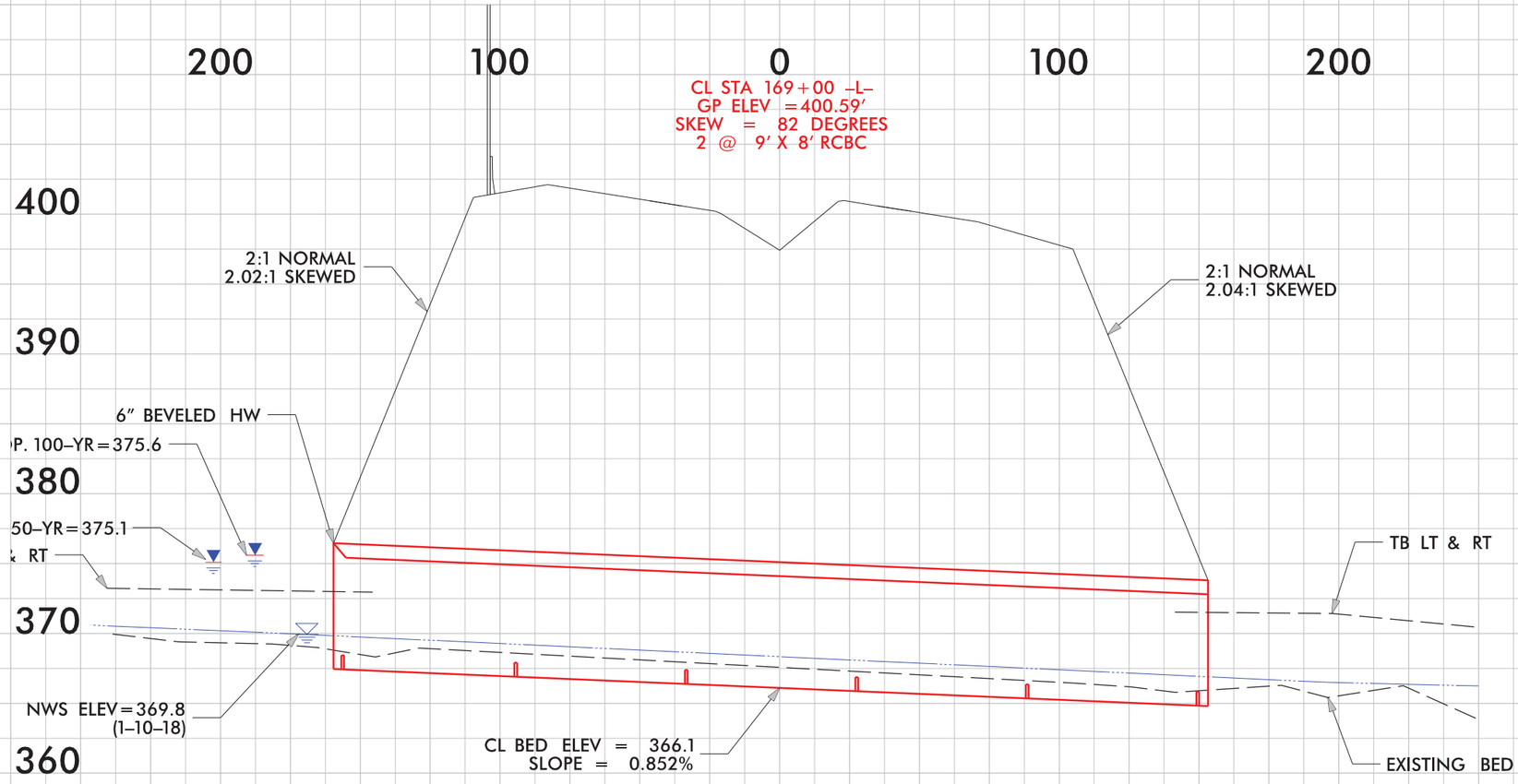
7/8/2018
R2721_grd_prm_wet_psh_16c_xpl.dgn
jharvey

PERMIT DRAWING SHEET 64 OF 119

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

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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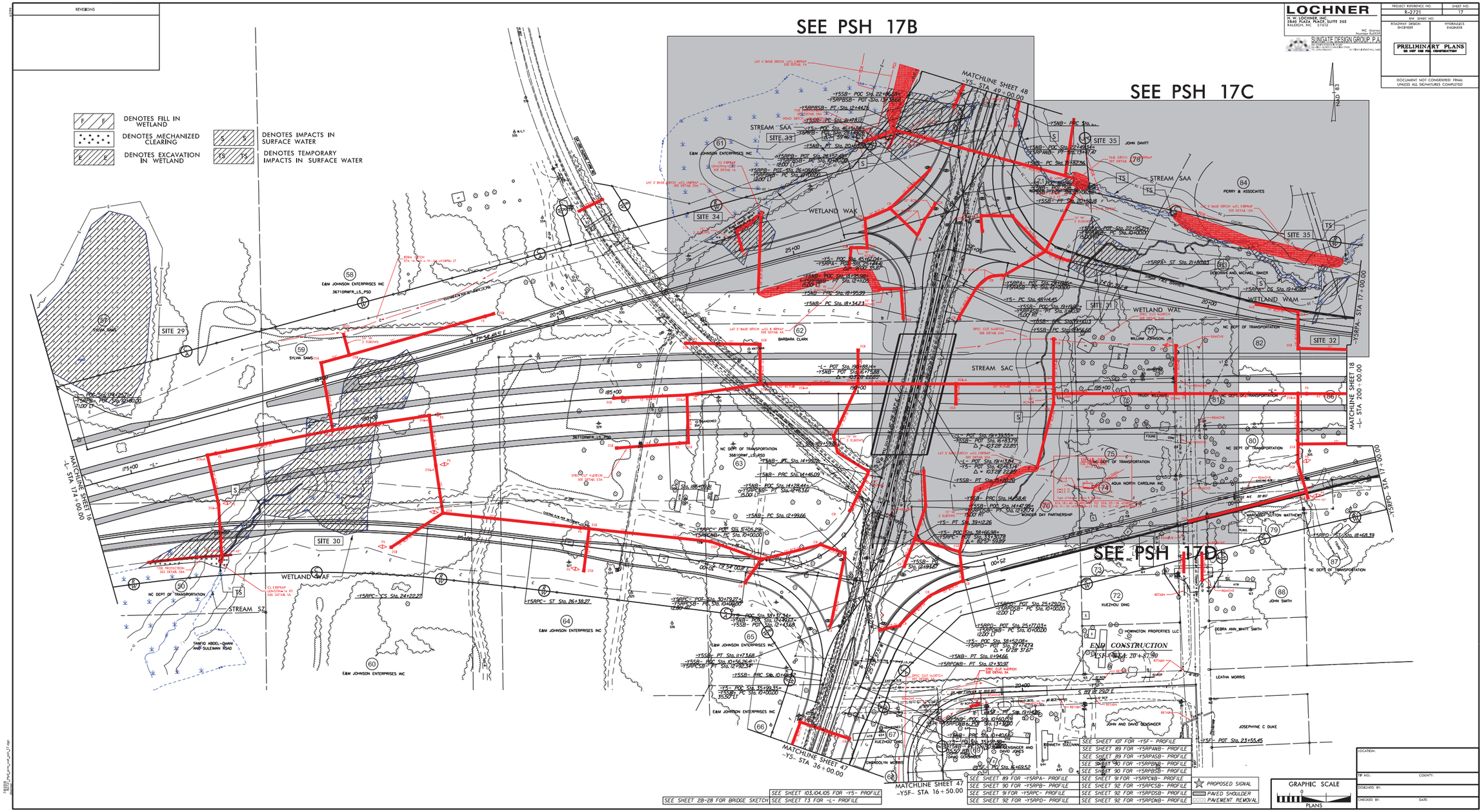

SEE PSH 17B
SEE PSH 17C
SEE PSH 17D
LOCHNER
SUNGATE DESIGN GROUP, P.A.
PRELIMINARY PLANS
DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
DENOTES EXCAVATION IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
MATCHLINE SHEET 48 -Y5- STA 49+00.00
MATCHLINE SHEET 18 -L- STA 200+00.00
MATCHLINE SHEET 16 -L- STA 174+00.00
MATCHLINE SHEET 47 -Y5- STA 36+00.00
MATCHLINE SHEET 47 -Y5F- STA 16+50.00
STREAM SAA
STREAM SAC
STREAM SZ
WETLAND WAK
WETLAND WAL
WETLAND WAM
WETLAND WAF
SITE 29
SITE 30
SITE 31
SITE 32
SITE 33
SITE 34
SITE 35
END CONSTRUCTION
GRAPHIC SCALE
PLANS
PROPOSED SIGNAL
PAVED SHOULDER
PAVEMENT REMOVAL

PERMIT DRAWING SHEET 66 OF 119

REVISIONS

PSH 17B

PSH 17C

SEE PSH 17D

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

MATCHLINE SHEET 48 -Y5- STA 49 + 00.00

MATCHLINE SHEET 18 -L- STA 200 + 00.00

MATCHLINE SHEET 17 -Y5RPA- STA 17 + 00.00

MATCHLINE SHEET 16 -L- STA 174 + 00.00

MATCHLINE SHEET 47 -Y5F- STA 38 + 00.00

MATCHLINE SHEET 47 -Y5F- STA 16 + 50.00

SEE SHEET 103,104,105 FOR -Y5- PROFILE
SEE SHEET 2B-28 FOR BRIDGE SKETCH | SEE SHEET 73 FOR -L- PROFILE

SEE SHEET 89 FOR -Y5RPA- PROFILE	SEE SHEET 91 FOR -Y5RPCNB- PROFILE
SEE SHEET 90 FOR -Y5RPB- PROFILE	SEE SHEET 92 FOR -Y5RPCSB- PROFILE
SEE SHEET 91 FOR -Y5RPC- PROFILE	SEE SHEET 92 FOR -Y5RPDSB- PROFILE
SEE SHEET 92 FOR -Y5RPD- PROFILE	SEE SHEET 92 FOR -Y5RPDNB- PROFILE

SEE SHEET 89 FOR -Y5RPANB- PROFILE	
SEE SHEET 89 FOR -Y5RPASB- PROFILE	
SEE SHEET 90 FOR -Y5RPBNB- PROFILE	
SEE SHEET 90 FOR -Y5RPBSB- PROFILE	

☆ PROPOSED SIGNAL
PAVED SHOULDER
PAVEMENT REMOVAL

GRAPHIC SCALE
0
PLANS

LOCHNER
H. W. LOCHNER, INC.
7344 RIDGE PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number P-0253

SUNGATE DESIGN GROUP, P.A.

PROJECT REFERENCE NO.	SHEET NO.
R-2721	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

LOCATION:
TIP NO.: COUNTY:
DESIGNED BY:
CHECKED BY: DATE:

8/17/99

PERMIT DRAWING SHEET 67 OF 119

F F DENOTES FILL IN WETLAND

E E DENOTES EXCAVATION IN WETLAND

DENOTES MECHANIZED CLEARING

S S DENOTES IMPACTS IN SURFACE WATER

25′ 12.5′ 0 25′ 50′
SCALE: 1″ = 50′

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

LAT 4′ BASE DITCH w/CL I RIPRAP
SEE DETAIL 7A

TOE PROTECTION
SEE DETAIL 38A

HEAD DITCH w/CL II RIPRAP
SEE DETAIL 45A

STREAM SAA

SITE 33

TS

S

61

E&M JOHNSON ENTERPRISES INC

CL I RIPRAP
LENGTH = 10 FT
SEE DETAIL 1A

CL I RIPRAP
DETAIL 20A

R/W

SITE 34

WETLAND WAK

TDE

PDE

PDI

E

PUE

WLB

BZ 1

BZ 2

4.65%

66″ RCP-ED

BURY INVERT 2.3 FT

15″ RCP-IV

15″ RCP-III

18″ RCP-III

18″ W/ 2 ELBOWS

15″ W/ 2 ELBOWS

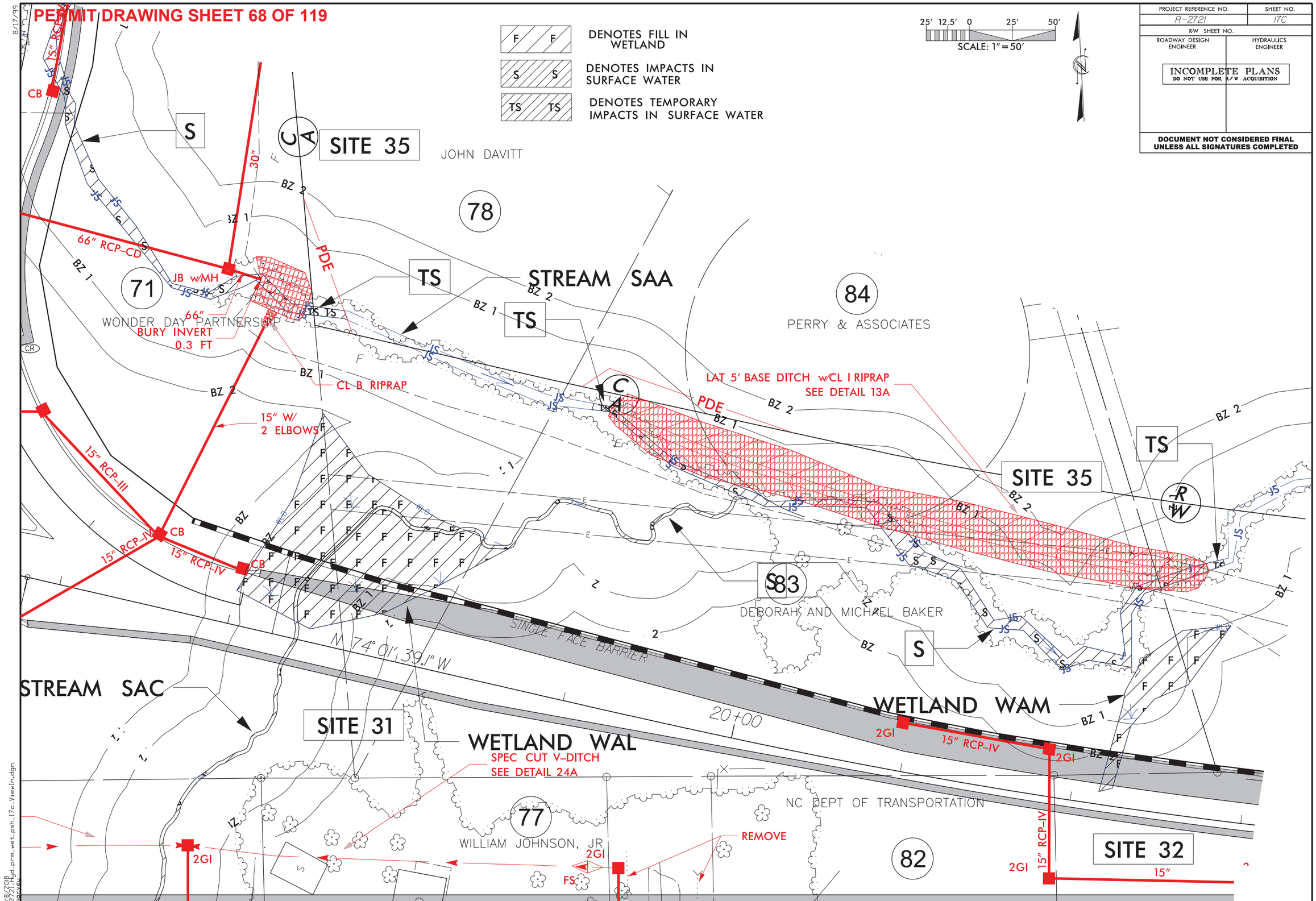
CB

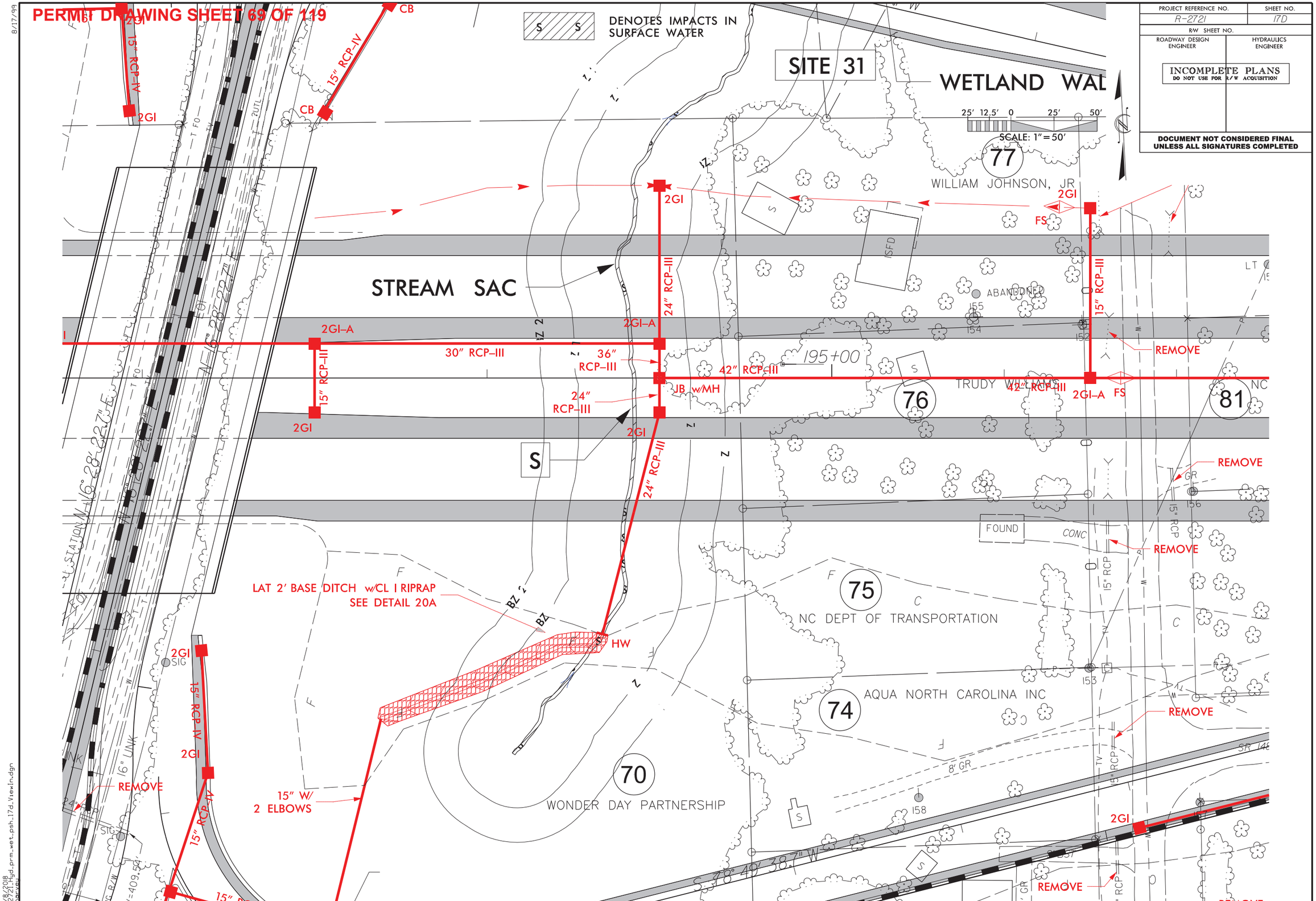
2GI

REMOVE 36″ CMP

25+00

7/8/2018
R2721_std_prm_wet_psh_17b_ViewIn.dgn
harvell


PERMIT DRAWING SHEET 68 OF 119
DENOTES FILL IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
SCALE: 1" = 50'
PROJECT REFERENCE NO.
R-2721
SHEET NO.
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
SITE 35
JOHN DAVITT
78
STREAM SAA
84
PERRY & ASSOCIATES
71
WONDER DAY PARTNERSHIP
66" RCP-CD
JB w/MH
66"
BURY INVERT 0.3 FT
CL B RIPRAP
15" W/ 2 ELBOWS
15" RCP-III
15" RCP-IV
30"
PDE
LAT 5' BASE DITCH w/CL I RIPRAP
SEE DETAIL 13A
SITE 35
83
DEBORAH AND MICHAEL BAKER
SINGLE FACE BARRIER
N 74° 01' 39.1" W
20+00
STREAM SAC
SITE 31
WETLAND WAL
SPEC CUT V-DITCH
SEE DETAIL 24A
WETLAND WAM
2GI
15" RCP-IV
NC DEPT OF TRANSPORTATION
77
WILLIAM JOHNSON, JR
REMOVE
82
SITE 32
15"
CB
BZ 1
BZ 2
BZ
JS
FS


PERMIT DRAWING SHEET 69 OF 119
PROJECT REFERENCE NO.
R-2721
SHEET NO.
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
DENOTES IMPACTS IN SURFACE WATER
SITE 31
WETLAND WAL
SCALE: 1" = 50'
STREAM SAC
WILLIAM JOHNSON, JR
TRUDY WILLIAMS
NC DEPT OF TRANSPORTATION
AQUA NORTH CAROLINA INC
WONDER DAY PARTNERSHIP
LAT 2' BASE DITCH w/CL I RIPRAP
SEE DETAIL 20A
15" W/
2 ELBOWS
30" RCP-III
36" RCP-III
24" RCP-III
42" RCP-III
15" RCP-III
15" RCP-IV
2GI
2GI-A
CB
FS
HW
JB w/MH
REMOVE
195+00
77
76
75
74
70
81
S
ABANDONED
FOUND
CONC
8' GR
16" UNK
S 78° 49' 38.7" W
8/17/99
7/8/2018
R2721_Hyd_prm_wet_psh_17d_ViewIn.dgn

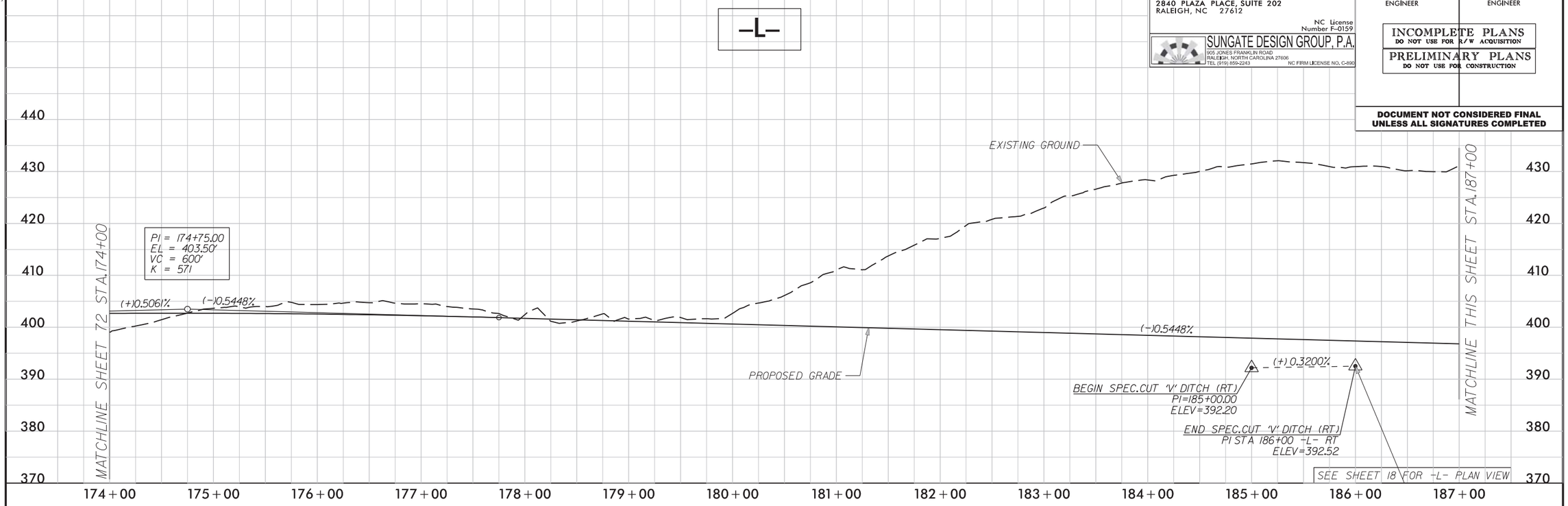
PERMIT DRAWING SHEET 70 OF 119

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159
SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 NC FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
R-2721	73
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

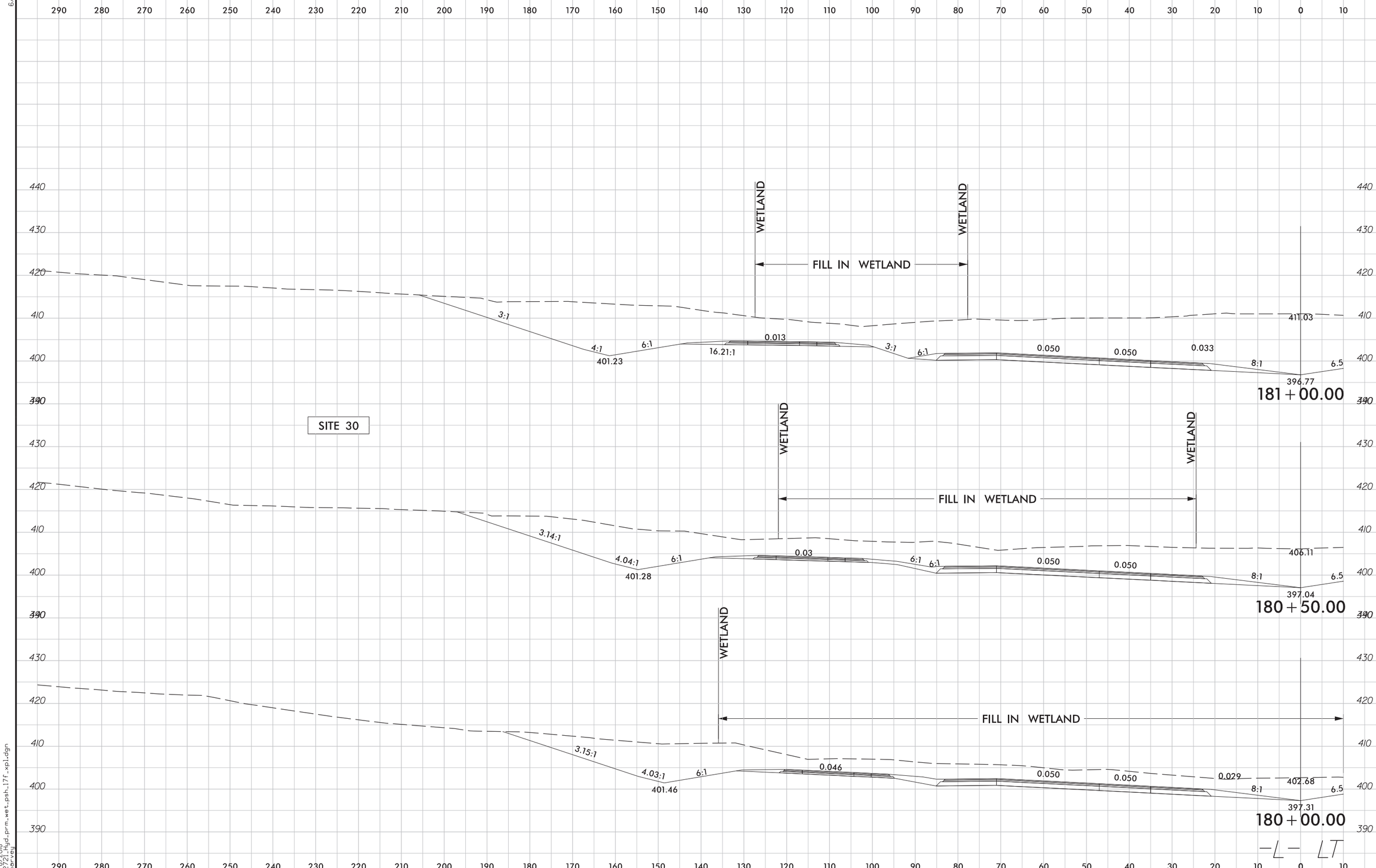
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



5/28/99

7/8/2018
R2721_Hyd_prm_wet_psh_17e_pfl.dgn
jharvey

PROJ. REFERENCE NO.	SHEET NO.
R-2721	X-113



6/23/16

7/8/2018
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jharvey

6/23/16

PERMIT DRAWING SHEET 72 OF 119

PROJ. REFERENCE NO.	SHEET NO.
R-2721	X-400

0 5 10

10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290

430 420 410 400 390

WETLAND

FILL IN WETLAND (WAF)

401.60 6.593:1 397.86

0.050 0.050 4:1

179 + 00.00

WETLAND WETLAND

FILL IN WETLAND (WAF)

401.21 6.593:1 398.13

0.050 0.050 4:1

178 + 50.00

SITE 30

WETLAND WETLAND

0.026 402.45 6.593:1 398.40

0.050 0.050

FILL IN WETLAND (WAF)

5.27:1 394.36

4:1

0.056 4.743:1

FILL IN WETLAND (WAF)

IMPACTS IN SURFACE WATER (SZ)

178 + 00.00

WETLAND WETLAND

403.53 6.593:1 398.67

0.050 0.050

FILL IN WETLAND (WAF) 5:1

4:1

0.056 3.567:1

394.94

FILL IN WETLAND (WAF)

IMPACTS IN SURFACE WATER (SZ)

177 + 50.00

-L- RT

7/9/2018
R2721_Hyd_prm_wet_psh_17g.xpl.dgn
jharvey

6/23/16

PERMIT DRAWING SHEET 73 OF 119

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2721	X-694

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

430 420 410 400 390 380 370 360 350

0.020 0.020

2:1 2:1 2:1

SITE 35

374.06

IMPACTS IN SURFACE WATER
(SAB)

49+00.00

SITE 33

WETLAND WETLAND WETLAND

FILL IN WETLAND
(WAK)

FILL IN
WETLAND
(WAK)

IMPACTS IN SURFACE WATER
(SAA)

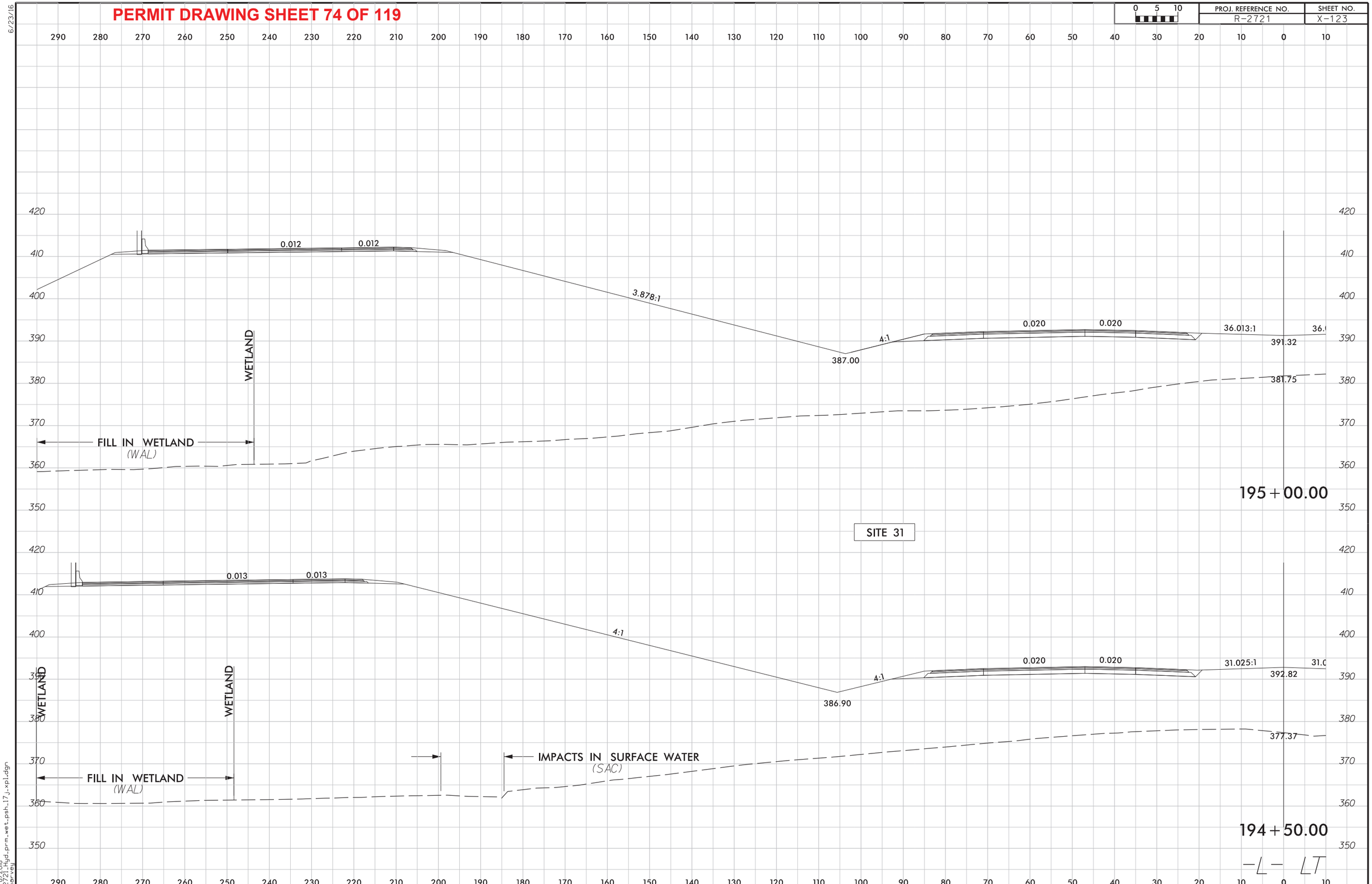
374.62

48+50.00

-Y5-

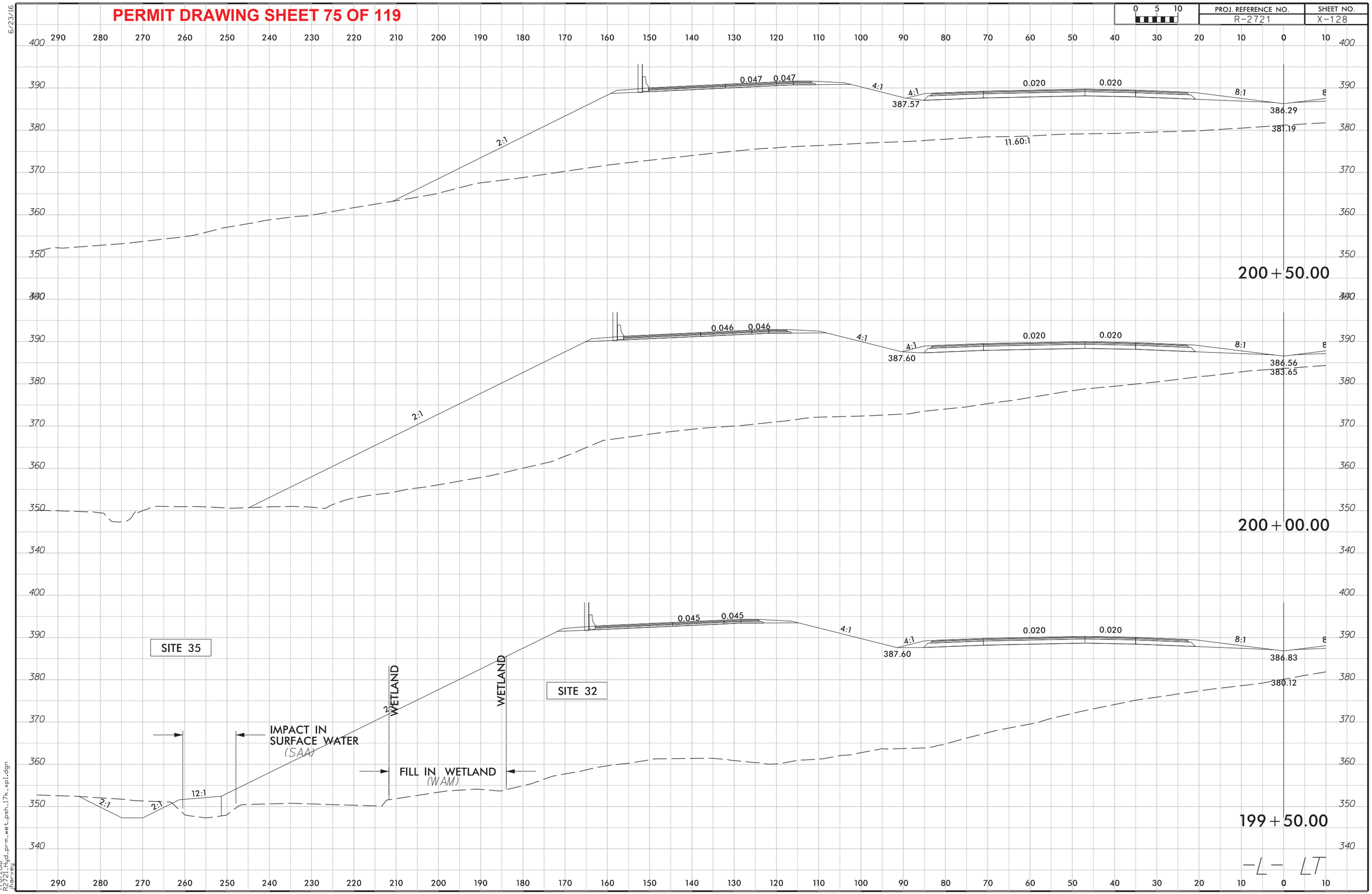
7/9/2018
R2721gd_prm_wet_psh_17h_xpl.dgn
jharvey

PROJ. REFERENCE NO.	SHEET NO.
R-2721	X-123



6/23/16

7/8/2018
R2721_Hyd_prm_wet_psh_17j_xpl.dgn
jharvey


PERMIT DRAWING SHEET 75 OF 119
PROJ. REFERENCE NO.
R-2721
SHEET NO.
X-128
0 5 10
200+50.00
0.047 0.047
4:1
4:1
387.57
0.020
0.020
8:1
386.29
381.19
2:1
11.60:1
200+00.00
0.046 0.046
4:1
4:1
387.60
0.020
0.020
8:1
386.56
383.65
2:1
199+50.00
0.045 0.045
4:1
4:1
387.60
0.020
0.020
8:1
386.83
380.12
SITE 35
SITE 32
WETLAND
WETLAND
IMPACT IN
SURFACE WATER
(SAA)
FILL IN WETLAND
(WAM)
2:1
2:1
12:1
-L- LT
6/23/16
7/8/2018
R2721_Hyd_prm_wet_psh_17k_xpl.dgn
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PERMIT DRAWING SHEET 76 OF 119

51499

SCALE: 1" = 100'

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
NC FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
R-2721	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

AQUA NORTH CAROLINA, INC.

85 THOMAS AND DEBORAH ATKINSON

88 SEAN AND ANNA STARR

89 FRANS OUDSHOORN

90 KAREN JETTON

91 THOMAS ANS SUSAN SLUCHAK

92 QUAD TRI LLC OLIVE, MARTHA

86 NC DEPT OF TRANSPORTATION

87 NC DEPT OF TRANSPORTATION

93 GEORGE I BOGER

SITE 35

SITE 36

SITE 37

SITE 38

-Y5RPA- TS Sta. 15+40.72

-Y5RPA- SC Sta. 16+40.72

-Y5RPA- 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

-Y5RPD- CS Sta. 16+18.39

-Y5RPD- SC Sta. 12+50.00

TS Sta. 212+05.98

MATCHLINE SHEET 17 -L- STA 200+00.00

MATCHLINE SHEET 19 -L- STA 213+00.00

INLET CHANNEL SEE DETAIL 53A

PACKFILL TO NC DI 847

LAT 5' BASE DITCH wCL I RIPRAP SEE DETAIL

LAT 2' BASE DITCH wCL B RIPRAP SEE DETAIL 4A

LAT 2' BASE DITCH wCL I RIPRAP SEE DETAIL 20A

CL I RIPRAP LENGTH=14 FT SEE DETAIL 1A

TOE PROTECTION SEE DETAIL 38A

OUTLET CHANNEL SEE DETAIL 53A

DAYLIGHT DITCH

BURY INVERT 0.3 FT

0.78%

2.86%

15" W/ 2 ELBOWS

18" W/ 2 ELBOWS

24" W/ 2 ELBOWS

42" W/ 2 ELBOWS

3@9'x 8' RCBC

15" RCP-III

15" RCP-IV

18" RCP-IV

24" RCP-IV

42" RCP-III

WETLAND WAO(1)

WETLAND WAO(2)

STREAM SAE

PAVEMENT REMOVAL

PAVED SHOULDER

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

SEE SHEET 89 FOR -Y5RPA- PROFILE
SEE SHEET 92 FOR -Y5RPD- PROFILE
SEE SHEET 73 FOR -L- PROFILE

7822018
R-2721_Hyd_prm_wet_psh_18.dgn
lhorney

PERMIT DRAWING SHEET 77 OF 119

51499

50′ 25′ 0 50′ 100′
SCALE: 1″ = 100′

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
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NC License Number F-0159

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
NC FIRM LICENSE NO, C-890

PROJECT REFERENCE NO.	SHEET NO.
R-2721	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT REMOVAL
PAVED SHOULDER

MATCHLINE SHEET 17 –L– STA 200+00.00

MATCHLINE SHEET 19 –L– STA 213+00.00

AQUA NORTH CAROLINA, INC.
20' DRAINAGE EASEMENT SCALED FROM BM 1985 PG 422
SEAN AND ANNA STARR
THOMAS AND DEBORAH ATKINSON
INLET CHANNEL SEE DETAIL 53A
SITE 35
–Y5RPA– TS Sta. 14+30.72
PDE
BACKFILL TO NC BL 847
LAT 2' BASE DITCH w/CL I RIPRAP SEE DETAIL 4A
FRANS OUDSHOORN
KAREN JETTON
THOMAS ANS SUSAN SLUCHAK
QUAD TRI LLC
OLIVE, MARTHA
WETLAND WAO(2)
–L– POT Sta. 207+09.24
–Y5RPA– POT Sta. 10+00.00
71.00' LT
TS Sta. 212+05.98
CL I RIPRAP LENGTH = 14 FT SEE DETAIL 1A
TOE PROTECTION SEE DETAIL 38A
DAYLIGHT DITCH
–Y5RPA– SC Sta. 15+40.72
–Y5RPA– STA 17+00.00
45.00' LT
N 83° 00' 23.2" W
0.78%
15" W/ 2 ELBOWS
18" W/ 2 ELBOWS
18" RCP-IV
15" RCP-IV
2.86%
BURY INVERT 0.3 FT
SITE 36
3@9'x 8' RCBC
205+00
210+00
S 87° 00' 00.1" E
42" RCP-III
NC DEPT OF TRANSPORTATION
100'
42" W/ 2 ELBOWS
LAT 2' BASE DITCH w/CL I RIPRAP SEE DETAIL 20A
TOE PROTECTION SEE DETAIL 38A
BEGIN DITCH FLOW
ABOVE ROCK
–Y5RPD– CS Sta. 16+18.39
–Y5RPD– SC Sta. 12+50.00
SITE 37
CL I RIPRAP
WETLAND WAO(1)
SITE 38
24" W/ 2 ELBOWS
24" RCP-IV
TYPE B-77
OUTLET CHANNEL SEE DETAIL 53A
–L– POT Sta. 207+54.92=
–Y5RPD– ST Sta. 10+00.00
71.00' RT
+73.00 –Y5RPD– (51.97' LT)
+08.00 –Y5RPD– (58.00' LT)
STREAM SAE
CL I RIPRAP LENGTH = 14 FT SEE DETAIL 1A
LAT 2' BASE DITCH w/CL I RIPRAP SEE DETAIL 20A
GEORGE BOGER

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

SEE SHEET 89 FOR –Y5RPA– PROFILE
SEE SHEET 92 FOR –Y5RPD– PROFILE
SEE SHEET 73 FOR –L– PROFILE

7820181
R2721_Hyd_prm_wet_psh_18a.dgn
jlovray

6/23/16

PERMIT DRAWING SHEET 78 OF 119

0 5 10

PROJ. REFERENCE NO.	SHEET NO.
R-2721	X-418

10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290

400 390 380 370 360 350 340 330

8:1 0.020 0.020

384.11

SITE 36

WETLAND

WETLAND

SITE 37

2.01:1

FILL IN WETLAND
(WAC(1))

IMPACTS IN SURFACE AREA

349.16

12:1 2:1 2:1

344.20

204+50.00

8:1 0.020 0.020 0.06 0.06

384.38

SITE 36

WETLAND

2.01:1

SITE 37

WETLAND

FILL IN WETLAND
(WAC(1))

IMPACTS IN SURFACE AREA

348.20

204+00.00

-L- RT

7/9/2018
R2721_grd_prm_wet_psh_18b_xpl.dgn
jharvey

6/23/16

PERMIT DRAWING SHEET 79 OF 119

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2721	X-423

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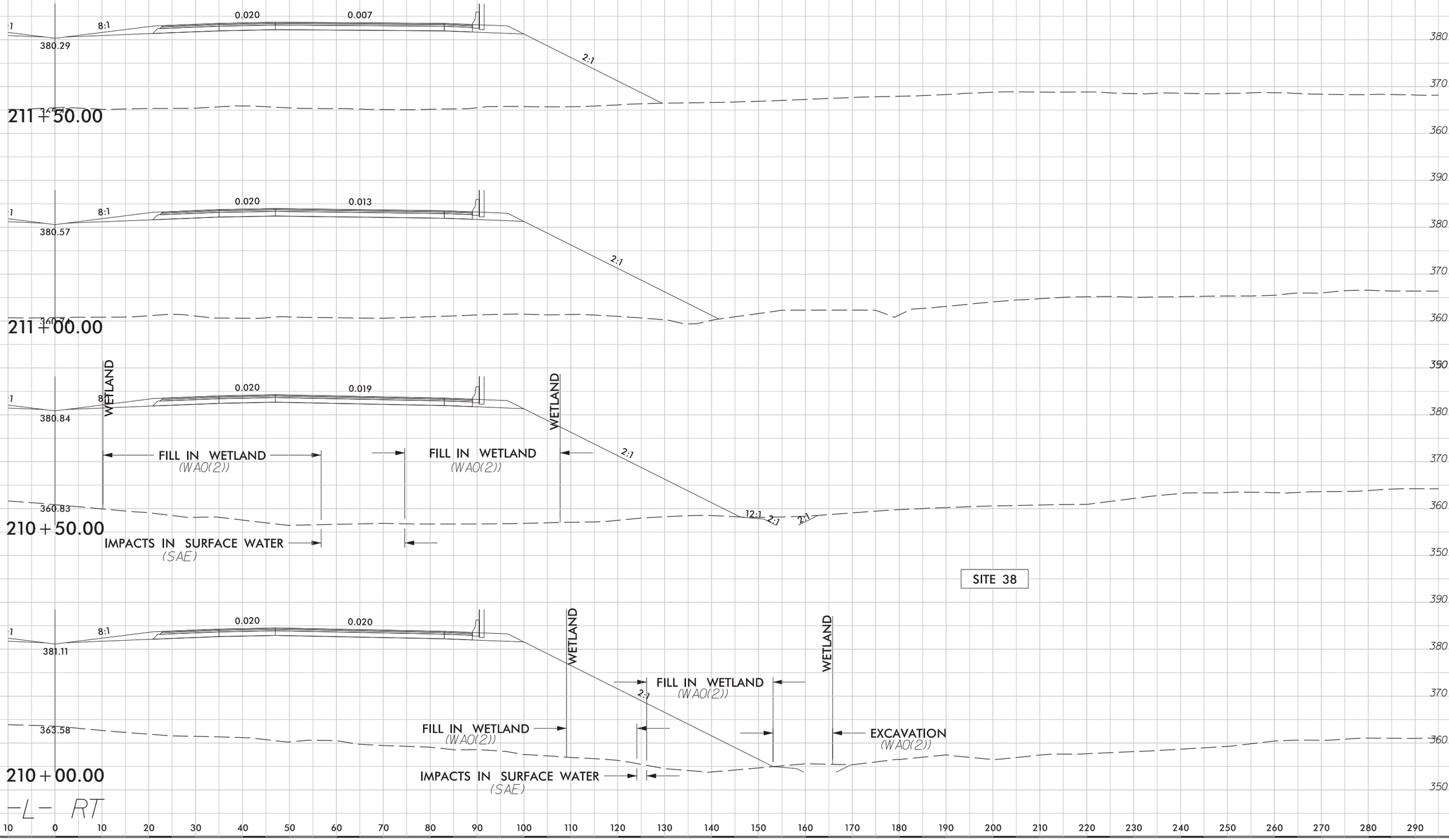
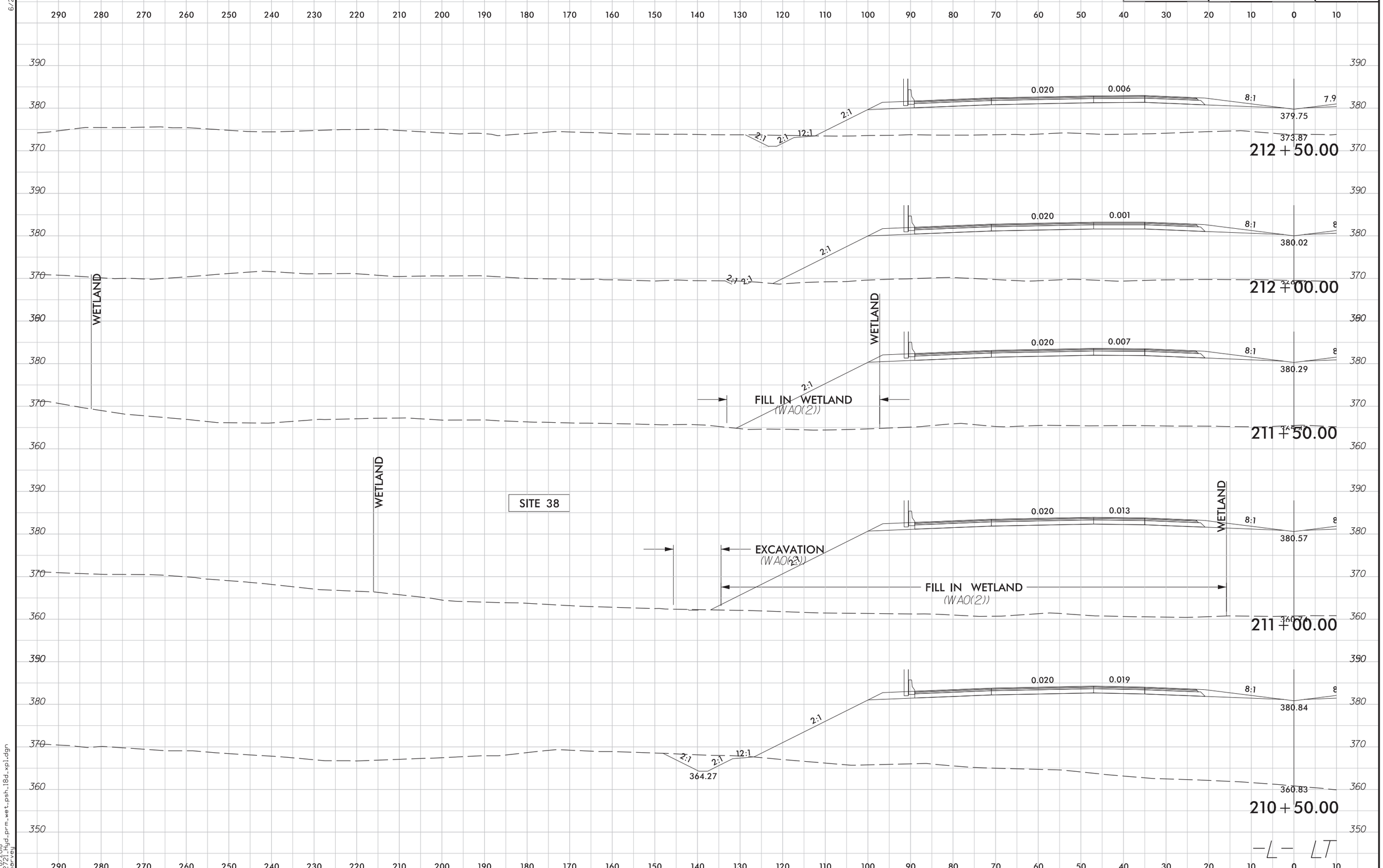
390 380 370 360 350



7/9/2018
R2721_hyd_prm_wet_psh_18c_xpl.dgn
jharvey

PROJ. REFERENCE NO.	SHEET NO.
R-2721	X-137



6/23/16

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R2721_Hyd_prm_wet_psh_18d_xpl.dgn
jharvey

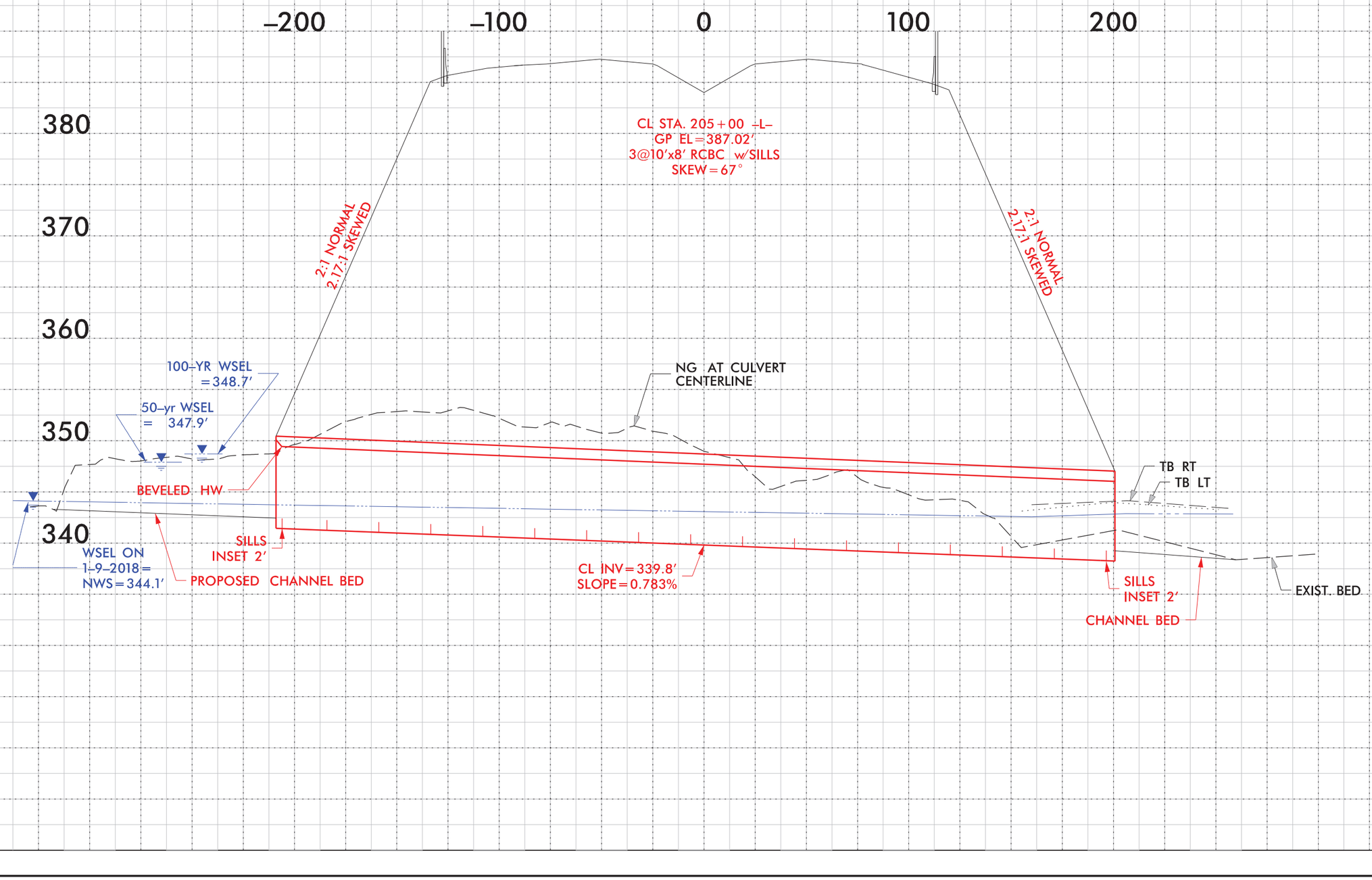
5/14/99

PERMIT DRAWING SHEET 81 OF 119

PROJECT REFERENCE NO.	SHEET NO.
R-2721	18E
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



7/8/2018
R2721_hyd-prm_wet_psh_18e_sec.dgn
barvej

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

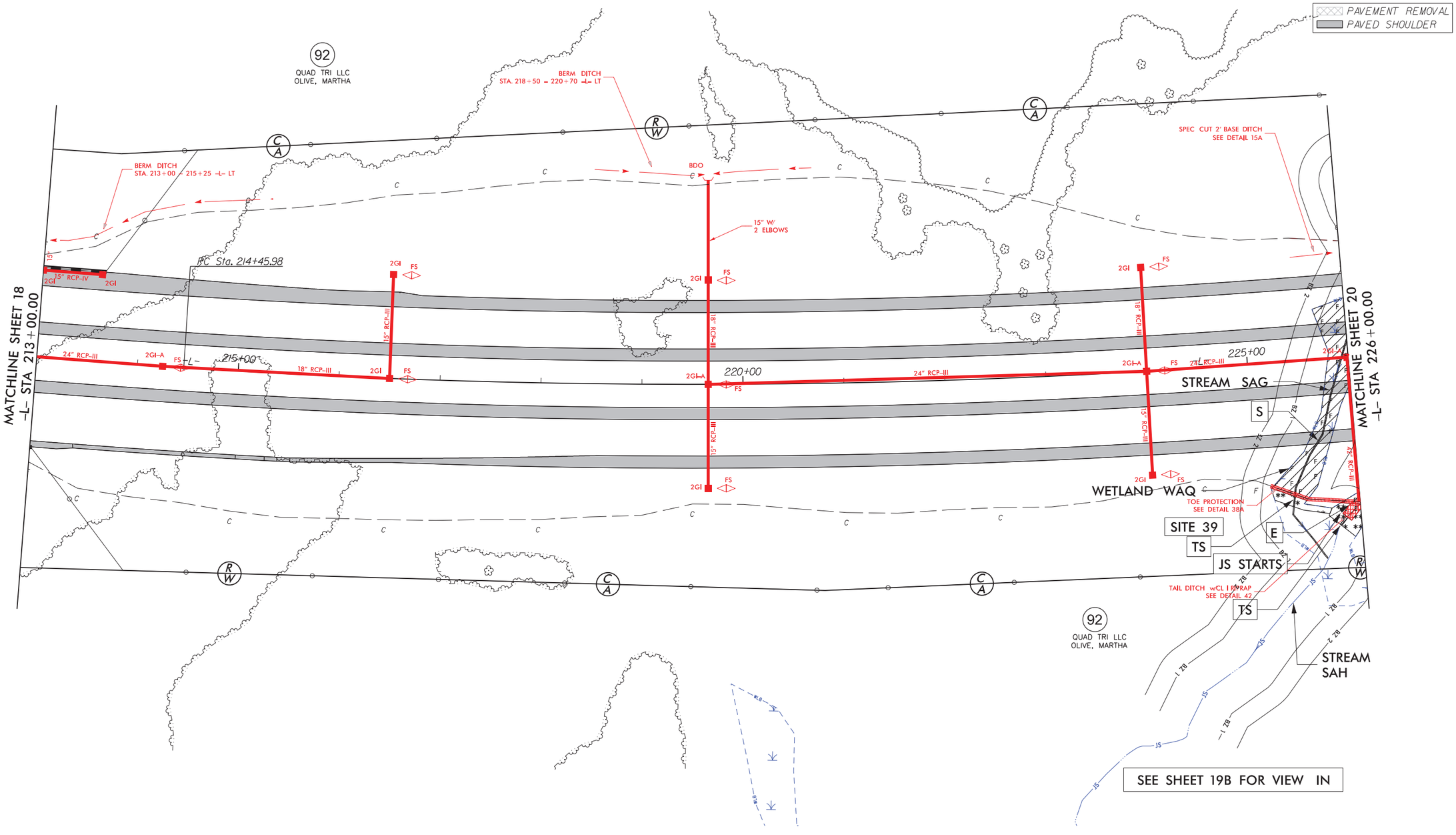
LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 NC FIRM LICENSE NO. C-890

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



SEE SHEET 73 FOR -L- PROFILE

51499

7/8/2018
R2721_Hyd_prm_wet_psh_19.dgn
jhorvey

PERMIT DRAWING SHEET 83 OF 119

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

NAD 83

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

LOCHNER
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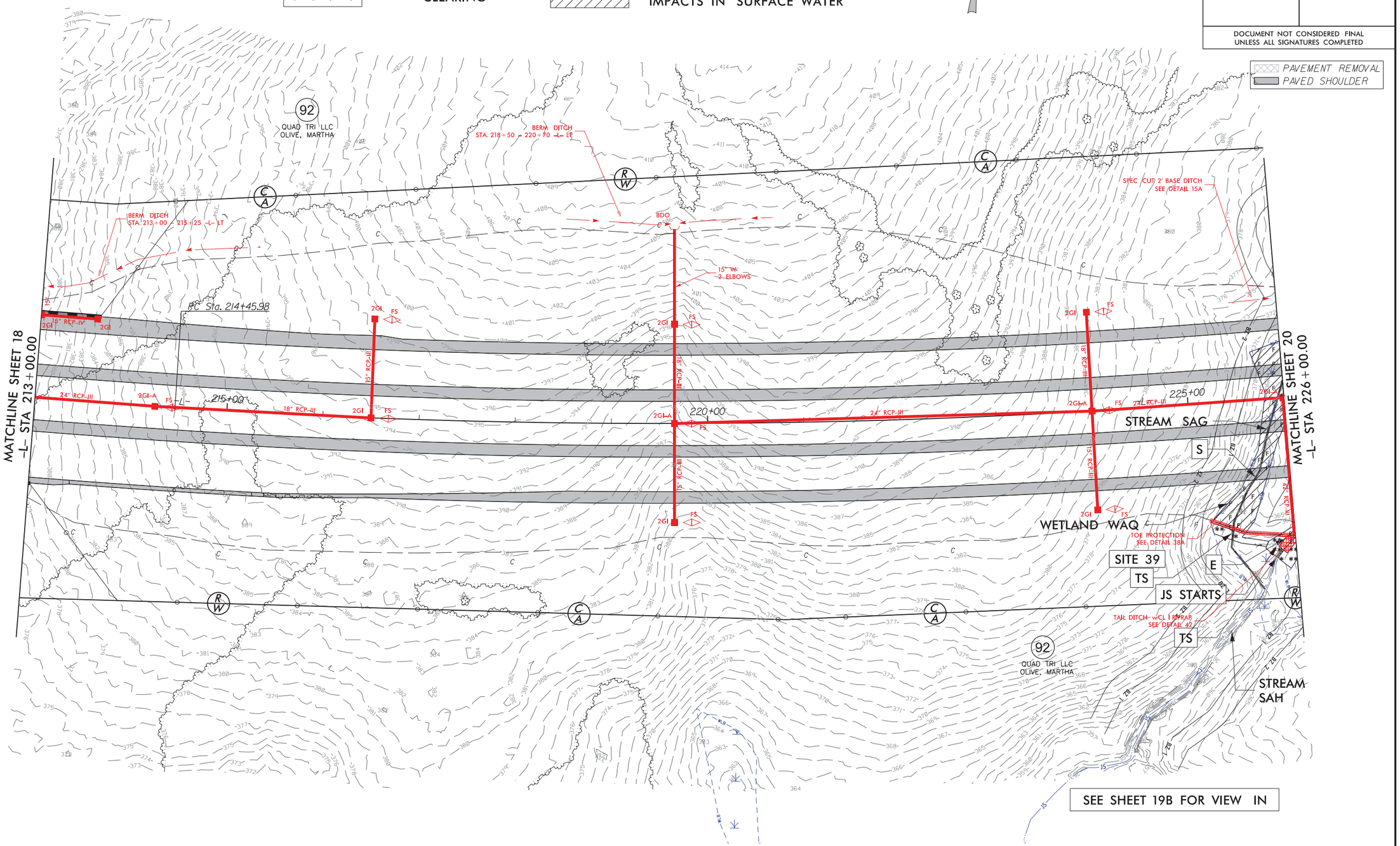
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 NC FIRM LICENSE NO. C-890

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

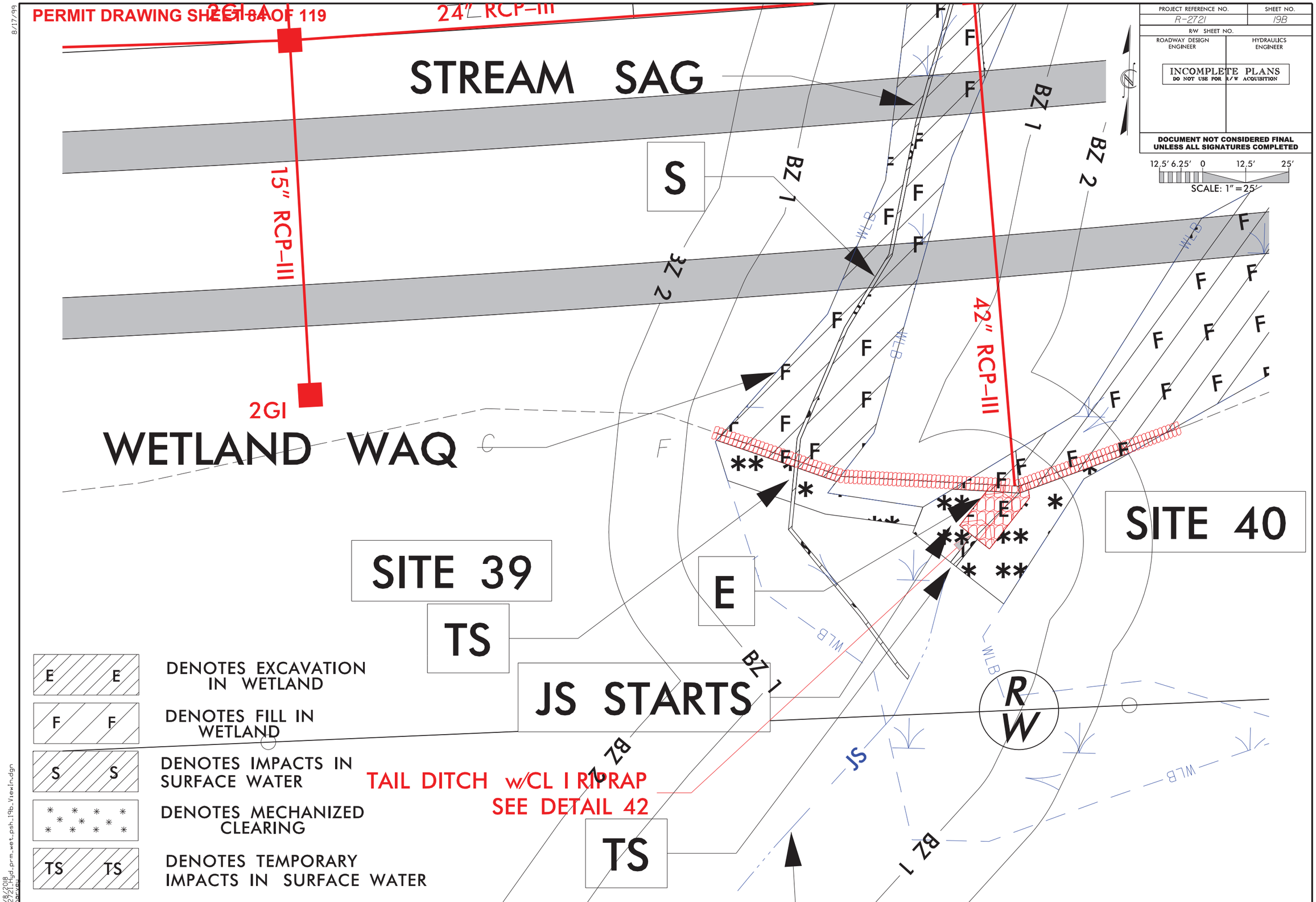
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



SEE SHEET 73 FOR -L- PROFILE

51499

7/8/2018
R2721_Hyd_prm_wet_psh_19a.dgn
jharvey


PERMIT DRAWING SHEET 84 OF 119
2GI-A
24" RCP-III
STREAM SAG
15" RCP-III
2GI
WETLAND WAQ
S
BZ 1
BZ 2
42" RCP-III
SITE 39
TS
E
JS STARTS
SITE 40
R
W
TAIL DITCH w/CL I RIPRAP
SEE DETAIL 42
TS
DENOTES EXCAVATION IN WETLAND
DENOTES FILL IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES MECHANIZED CLEARING
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
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'
8/17/99
7/8/2018
R2721_Hyd_prm_wet_psh_19b_ViewIn.dgn

PERMIT DRAWING SHEET 85 OF 119

5/28/99

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 1049	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 347.6	FT
BASE DISCHARGE	= 1287	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 348.4	FT
OVERTOPPING DISCHARGE	= 3850	CFS
OVERTOPPING FREQUENCY	= 500 +	YRS
OVERTOPPING ELEVATION	= 369.0	FT

PIPE HYDRAULIC DATA

30" RCP Sta. 149+64 -L-

DRAINAGE AREA	= 8.7	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 27	CFS
DESIGN HW ELEVATION	= 383.0	FT
100 YEAR DISCHARGE	= 28	CFS
100 YEAR HW ELEVATION	= 383.1	FT
OVERTOPPING FREQUENCY	= 500 +	YRS
OVERTOPPING DISCHARGE	= 34	CFS
OVERTOPPING ELEVATION	= 383.5	FT

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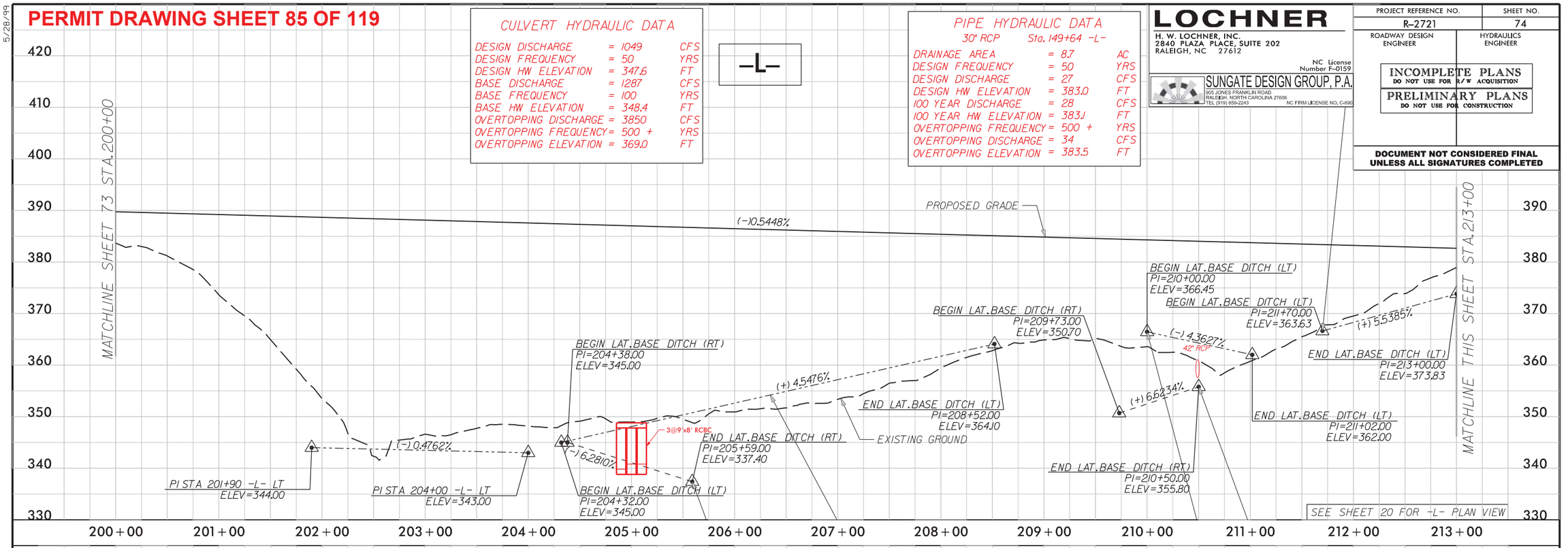
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
NC FIRM LICENSE NO. C-890

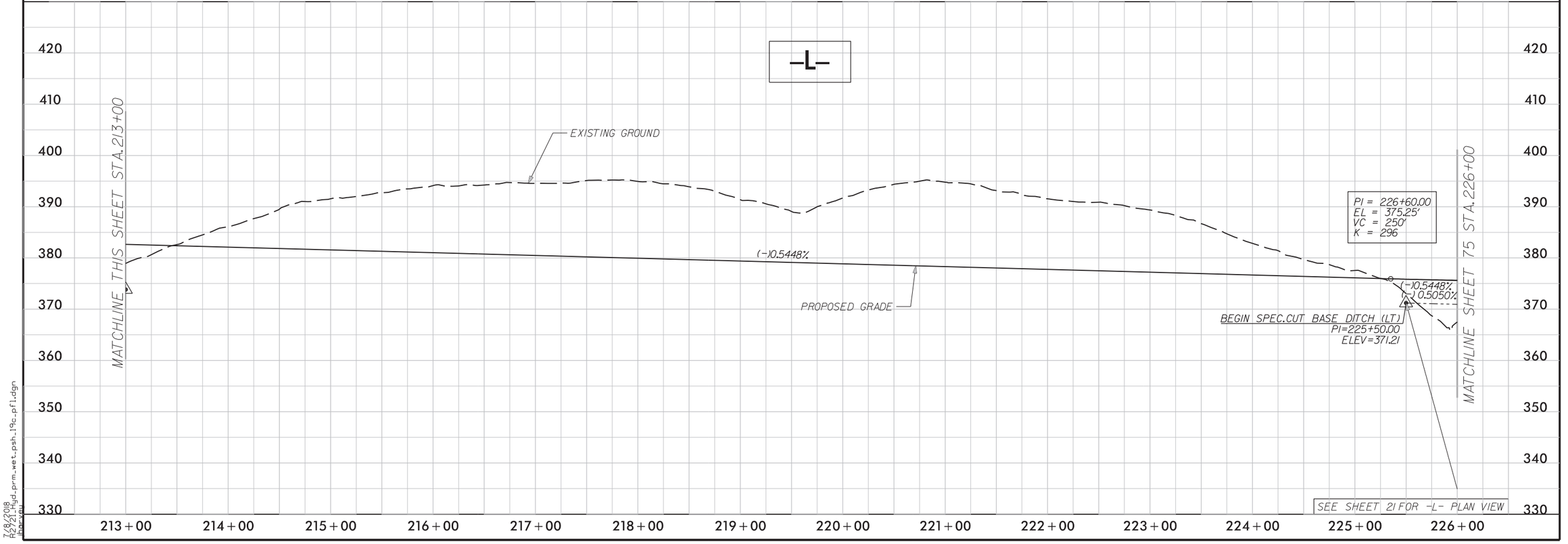
PROJECT REFERENCE NO.	SHEET NO.
R-2721	74
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED





7/8/2018
R2721_Hyd_prm_wet_psh_19c_pfl.dgn
jbarvey

6/23/16

PERMIT DRAWING SHEET 86 OF 119

PROJ. REFERENCE NO.	SHEET NO.
R-2721	X-431

0 5 10

10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290

390 380 370 360

SITE 39

WETLAND

FILL IN WETLAND (WAQ)

0.030 0.030

2.5:1 8:1

372.46

367.50

4:1

226+00.00

SITE 40

WETLAND WETLAND WETLAND WETLAND

FILL IN WETLAND (WAQ)

EXCAVATION (WAQ)

WETLAND WETLAND WETLAND

0.030 0.030

2.5:1 8:1

377.05

372.87

4:1

FILL IN WETLAND (WAQ)

IMPACTS IN SURFACE WATER (SAG)

225+50.00

SITE 39

WETLAND

IMPACTS IN SURFACE WATER (SAG)

390 380 370 360

0.030 0.030

2.5:1 8:1

377.56

372.94

3.48:1

225+00.00

390 380 370 360

0.030 0.030

2.5:1 8:1

379.70

373.21

6:1 5.99:1

374.04

224+50.00

350

—L— RT

10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290

7/8/2018
R2721Hyd_prm_wet_psh_19d_xpl.dgn
jharvey

51499

PERMIT DRAWING SHEET 87 OF 119

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

LOCHNER
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NC License Number F-0159

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RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 NC FIRM LICENSE NO. C-890

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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

PAVEMENT REMOVAL
PAVED SHOULDER

NAD 83

MATCHLINE SHEET 53
-Y6- STA 21+00.00

MATCHLINE SHEET 19
-L- STA 226+00.00

MATCHLINE SHEET 21
-L- STA 239+00.00

92
QUAD TRI LLC
OLIVE, MARTHA

STREAM SAG

SITE 39

SITE 40

WETLAND WAQ

HEAD DITCH w/CL I RIPRAP SEE DETAIL 40A

HEAD DITCH w/CL I RIPRAP SEE DETAIL 44A

TOE PROTECTION SEE DETAIL 38A

FALSE CUT SEE DETAIL 27A

SPEC CUT 2' BASE DITCH SEE DETAIL 15A

SPEC CUT V-DITCH SEE DETAIL 19A

SPEC LAT V-DITCH SEE DETAIL 14A

CL B RIPRAP

36" W/ 2 ELBOWS

15" W/ 2 ELBOW

15" W/ 3 ELBOWS

REMOVE

BDO

BERM DITCH STA. 229+54 – 230+50 -L- RT

-L- POC Sta. 231+09.54
-Y6- POT Sta. 16+65.83
Δ = 84°46'56.15"

-L- CS Sta. 233+93.56

-L- ST Sta. 236+03.56

-Y6- PT Sta. 14+76.32

-Y6- PRC Sta. 12+82.77

-L- N 77° 00' 00.1" E

-Y6- N 15° 21' 00.0" W

50' POWER LINE EASEMENT BM 1979 PG 361

50' R/W TRANSMISSION LINE ROW BM 1979 PG 361

SR 1959 PIERCE RD 20' EST

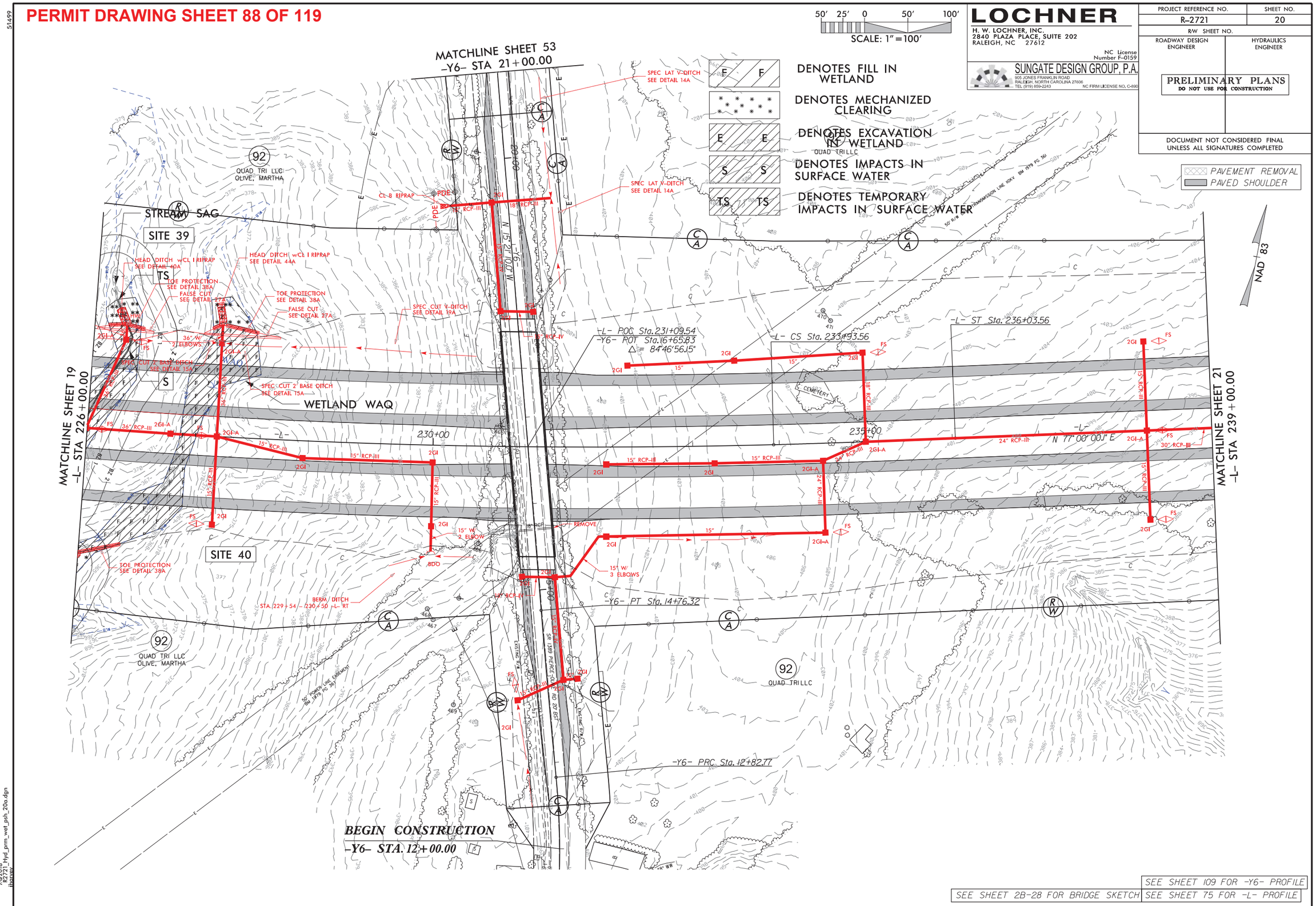
EXISTING R/W

CEMETERY

BEGIN CONSTRUCTION
-Y6- STA. 12+00.00

SEE SHEET 109 FOR -Y6- PROFILE
SEE SHEET 2B-28 FOR BRIDGE SKETCH | SEE SHEET 75 FOR -L- PROFILE

7/8/2018
R-2721_Hyd_prm_wet_psh_20.dgn
jhorney



50' 25' 0 50' 100'
SCALE: 1" = 100'
LOCHNER
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905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
NC FIRM LICENSE NO. C-890
PROJECT REFERENCE NO.
R-2721
SHEET NO.
20
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
PAVEMENT REMOVAL
PAVED SHOULDER
DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
DENOTES EXCAVATION IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
MATCHLINE SHEET 53
-Y6- STA 21+00.00
MATCHLINE SHEET 19
-L- STA 226+00.00
MATCHLINE SHEET 21
-L- STA 239+00.00
STREAM SAG
SITE 39
SITE 40
WETLAND WAQ
QUAD TRI LLC
OLIVE, MARTHA
-L- POC Sta. 231+09.54
-Y6- POT Sta. 16+65.83
Δ = 84°46'56.15"
-L- CS Sta. 233+93.56
-L- ST Sta. 236+03.56
-Y6- PT Sta. 14+76.32
-Y6- PRC Sta. 12+82.77
N 15°21'10.0" W
N 77°00'00.1" E
230+00
235+00
NAD 83
BEGIN CONSTRUCTION
-Y6- STA. 12+00.00
SEE SHEET 109 FOR -Y6- PROFILE
SEE SHEET 2B-28 FOR BRIDGE SKETCH
SEE SHEET 75 FOR -L- PROFILE

PERMIT DRAWING SHEET 89 OF 119

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159

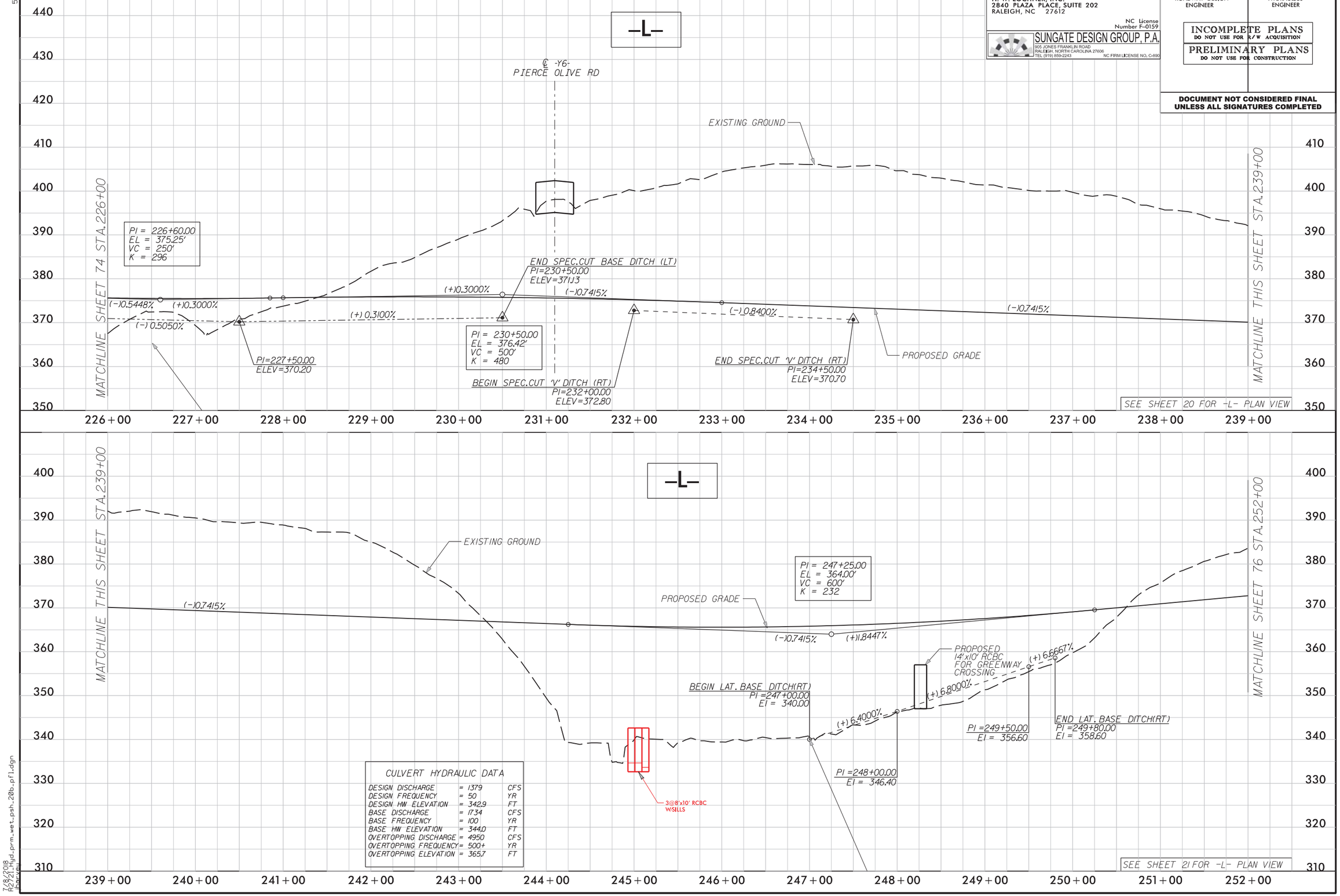
SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 NC FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
R-2721	75
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



CULVERT HYDRAULIC DATA

DESIGN DISCHARGE	= 1379	CFS
DESIGN FREQUENCY	= 50	YR
DESIGN HW ELEVATION	= 342.9	FT
BASE DISCHARGE	= 1734	CFS
BASE FREQUENCY	= 100	YR
BASE HW ELEVATION	= 344.0	FT
OVERTOPPING DISCHARGE	= 4950	CFS
OVERTOPPING FREQUENCY	= 500+	YR
OVERTOPPING ELEVATION	= 365.7	FT

5/28/99

7/8/2018
R2721_Hyd_prm_wet_psh_20b_pfl.dgn
jbarvey

6/23/16

PERMIT DRAWING SHEET 90 OF 119

0 5 10

PROJ. REFERENCE NO.	SHEET NO.
R-2721	X-432

10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160 170 180 190 200 210 220 230 240 250 260 270 280 290

400 390 380 370 360

34:1 13.591:1 0.030 0.030 6:1 4:1 3.06:1

376.67 374.98

228+50.00

96:1 49.106:1 0.030 0.030 6:1 4.54:1

375.52 373.76 373.75

228+00.00

97:1 25.230:1 0.030 0.030 6:1 5.99:1

374.15 370.82 373.35

227+50.00

WETLAND WETLAND

FILL IN WETLAND (WAQ)

4:1 9.714:1 0.030 0.030 4.99:1

372.77 369.36

227+00.00

SITE 40

WETLAND WETLAND

FILL IN WETLAND (WAQ)

25:1 8:1 0.030 0.030 4:1

372.44 372.34

226+50.00

-L- RT

7/9/2018
R2721_grd_prm_wet_psh_20c_xpl.dgn
jharvey

6/23/16

PERMIT DRAWING SHEET 91 OF 119

PROJ. REFERENCE NO.	SHEET NO.
R-2721	X-145

0 5 10

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

390 380 370 360 350

WETLAND

WETLAND

WETLAND

FILL IN WETLAND (WAQ)

SITE 39

FILL IN WETLAND (WAQ)

IMPACTS IN SURFACE WATER (SAG)

227+00.00

2.263:1 6:1 370.85 0.030 0.030 9.124:1 9.7 372.77 369.36

226+50.00

2:1 2:1 6:1 370.89 0.030 0.030 7.595:1 8 372.44 372.34

226+00.00

4:1 6:1 370.96 0.030 0.030 7.595:1 8 372.46 367.50

225+50.00

3.26:1 4:1 6:1 371.21 0.030 0.030 7.595:1 8 373.05 372.67

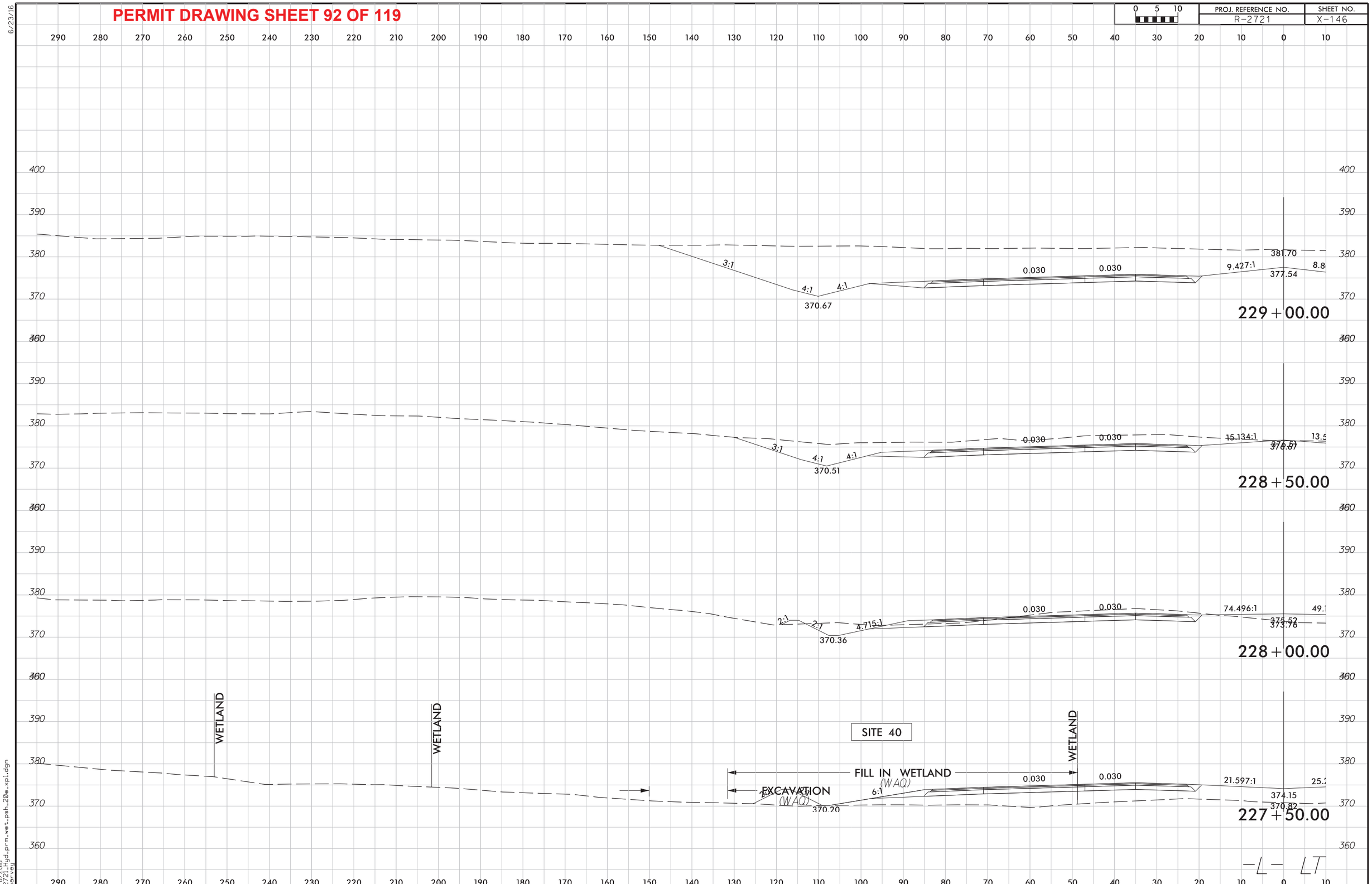
225+00.00

3.22:1 4:1 6:1 371.48 0.030 0.030 7.595:1 8 377.56 372.94

—L— LT

7/8/2016
R2721_grd_prm_wet_psh_20d_xpl.dgn
jharvey

PROJ. REFERENCE NO.	SHEET NO.
R-2721	X-146



6/23/16

7/8/2018
R2721_Hyd_prm_wet_psh_20e_xpl.dgn
jharvey

51499

PERMIT DRAWING SHEET 93 OF 119

50′ 25′ 0 50′ 100′

SCALE: 1″=100′

NAD 83

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

NC License Number F-0159

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
NC FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
R-2721	40
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT REMOVAL
PAVED SHOULDER

PATSY SMITH MORGAN, TRUSTEE
SMITH FAMILY CHARITABLE TRUST

PATSY SMITH MORGAN, TRUSTEE
SMITH FAMILY CHARITABLE TRUST

PATSY SMITH MORGAN, TRUSTEE
SMITH FAMILY CHARITABLE TRUST

PATSY SMITH MORGAN, TRUSTEE
SMITH FAMILY CHARITABLE TRUST

PATSY SMITH MORGAN, TRUSTEE
SMITH FAMILY CHARITABLE TRUST

PATSY SMITH MORGAN, TRUSTEE
SMITH FAMILY CHARITABLE TRUST

215
R. MARKHAM &
RUTH B. STEWART
MELISSA S. &
ANTHONY K. WOODELL

215
R. MARKHAM &
RUTH B. STEWART
MELISSA S. &
ANTHONY K. WOODELL

412
ANTHONY K. WOODELL AND
MELISSA S. WOODELL

216
R. MARKHAM &
RUTH B. STEWART

ANTHONY K. WOODELL AND
MELISSA S. WOODELL

STREAM SB

STREAM SB

SITE 51

SITE 41

CL II RIPRAP
LENGTH=26 FT
SEE DETAIL 2A

LAT V-DITCH w/CL B RIPRAP
SEE DETAIL 22A

HEAD DITCH w/CL I RIPRAP
SEE DETAIL 43A

COLLAR
REMOVE
HW

JB w/MH
48" RCP-III
3%

2.50%

2.09%

MATCHLINE SHEET 6
-Y1- STA 31+00.00

EXISTING R/W

R/W MON

SR 1112 OLD SMITHFIELD RD
SR 1112 OLD SMITHFIELD RD

NC 55 BYP SBL 58' BST

NC 55 BYP SBL 45' BST

NC 55 BYP NBL 57' BST

NC 55 BYP NBL 32' BST

20+00

25+00

30+00

24" RCP

18" RCP

30" RCP

15" RCP

48" RCP

48" WW

CONC ISL

RETAIN

RIPRAP

CONC HW

CB

DI

EOP

MTL

TOP=378.45'

TOP=379.55'

S

TS

DENOTES IMPACTS IN SURFACE WATER

782018
R2721_Hyd_prm_vert_psh_40.dgn
jhorney

51499

PERMIT DRAWING SHEET 94 OF 119

50′ 25′ 0 50′ 100′

SCALE: 1″=100′

NAD 83

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

NC License Number F-0159

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
NC FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
R-2721	40
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT REMOVAL
PAVED SHOULDER

PATSY SMITH MORGAN, TRUSTEE
SMITH FAMILY CHARITABLE TRUST

PATSY SMITH MORGAN, TRUSTEE
SMITH FAMILY CHARITABLE TRUST

PATSY SMITH MORGAN, TRUSTEE
SMITH FAMILY CHARITABLE TRUST

215
R. MARKHAM &
RUTH B. STEWART
MELISSA S. &
ANTHONY K. WOODELL

412
ANTHONY K. WOODELL AND
MELISSA S. WOODELL

STREAM SB

SITE 51

SITE 41

CL II RIPRAP, LENGTH=26 FT
SEE DETAIL 2A

LAT V-DITCH w/CL B RIPRAP
SEE DETAIL 22A

HEAD DITCH w/CL I RIPRAP
SEE DETAIL 42A

COLLAR
REMOVE HW

JB w/MH

NC 55 BYP SBL 58' BST

NC 55 BYP SBL 45' BST

NC 55 BYP NBL 57' BST

NC 55 BYP NBL 32' BST

SR 2210 OLD SMITHFIELD RD

RETAIN

20+00

30+00

MATCHLINE SHEET 6
-Y1- STA 31+00.00

PATSY SMITH MORGAN, TRUSTEE
SMITH FAMILY CHARITABLE TRUST

R. MARKHAM &
RUTH B. STEWART

S S DENOTES IMPACTS IN SURFACE WATER

7822018
R2721_hyd_prm_wet_psh_40a.dgn
jhardee

PERMIT DRAWING SHEET 95 OF 119

51499

50′ 25′ 0 50′ 100′
SCALE: 1″=100′

NAD 83

LOCHNER
H. W. LOCHNER, INC.
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RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 NC FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
R-2721	42
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT REMOVAL
PAVED SHOULDER

21 SUNSET HILLS HOMEOWNERS ASSOCIATION

22 HSA PROPERTIES LLC

24 NC DEPT. OF TRANSPORTATION

26 THE MATA FAMILY, LLC

217 TOWN OF APEX

218 D.R. HORTON, INC

219 ARBOR CREEK KS, LLC

220 TOWN OF HOLLY SPRINGS

221 BNRICO, LLC

WETLAND WS

PRIVATE OPEN SPACE

STREAM SO

SITE 42

SITE 43

SITE 44

TS

PUE

TOWN OF APEX PUMP STATION EASEMENT

20' SEWER EASEMENT BM 1997 PG 1103

HOLLY SPRINGS GREENWAY TRAIL

MATCHLINE SHEET 11
-Y3- STA 22+00.00

MATCHLINE SHEET 11

-Y3- PT Sta. 10+00.00

-Y3- PT Sta. 14+65.18

BEGIN CONSTRUCTION
-Y3- STA. 10+00.00

-Y3- Sta. 20+00.00

S 68° 08' 00.2" E

S 83° 58' 49.9" E

TOE PROTECTION SEE DETAIL 38A

INLET CHANNEL SEE DETAIL 54A

OUTLET CHANNEL SEE DETAIL 54A

LAT 2' BASE DITCH w/CL I RIPRAP SEE DETAIL 30A

CL B RIPRAP

RETAIN

REMOVE

TDE WALL

0.55%

KELLY M. MCGEE

CATHERINE E. CARVER

MINNIE J. AND WILLIE C. BRIDGES

JOSH D. PALADENI

CHAD D. WOODARD

ARBOR CREEK SUBDIVISION

CHARLIE K. CHAN AND IRIS Y. CHU

ROSE PROPERTY ONE, LLC

FRANK TOMS III AND LAURA DAVES TOMS

JOHN LUCIDO

RAQUEL BROOKS

SEN LOUIE AND LILY CHOW

AMANDA MARIE KRIARIS

TUSHAR AND LEENA BAJAJ

ROBERT AND COLLEEN BALES

ZACHARY LEWIS HALL DARIN S. LEIGH

EARNEST B. III AND JENNIFER N. GOODRICH

SREENIVAS VEMULAPALLI AND SRIVALLI DONTHINENI

CHANDRA YELLAPANTULA AND HARINATH APPANI

ZACHARY DARGATZ AND KRISTEN KNIGHT

CURRIN BROS., INC

F F DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SEE SHEET 2B-27 FOR BRIDGE SKETCH | SEE SHEET 101 FOR -Y3- PROFILE

782018
8272
thorvey
782018_Hyd_prm_wet_psh_42.dgn

51499

PERMIT DRAWING SHEET 96 OF 119

50′ 25′ 0 50′ 100′
SCALE: 1″=100′

NAD 83

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 NC FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
R-2721	42
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT REMOVAL
PAVED SHOULDER

21 SUNSET HILLS HOMEOWNERS ASSOCIATION

22 HSA PROPERTIES LLC

WETLAND WS

218 D.R. HORTON, INC
PRIVATE OPEN SPACE

STREAM SO

MATCHLINE SHEET 11

24 NC DEPT. OF TRANSPORTATION

SITE 42

SITE 44

SITE 43

TS

217 TOWN OF APEX PUMP STATION EASEMENT

KELLY M. MCGEE

CATHERINE E. CARVER

MINNIE J. AND WILLIE C. BRIDGES

-Y3- POT Sta. 10+00.00

JOSH D. PALADENI

CHAD D. WOODARD

BEGIN CONSTRUCTION
-Y3- STA. 10+00.00

-Y3- PT Sta. 14+65.18

-Y3- Sta. 20+00.00

S 68° 08' 00.2" E

S 83° 58' 49" E

SR 1301 SUNSET LAKE ROAD

ARBOR CREEK SUBDIVISION

CHARLIE K. CHAN AND ISIS Y. CHU

JOSE PROPERTY ONE, LLC

FRANK TOMS III AND LAURA DAVES TOMS

RAQUEL BROOKS

SEN LOUIE AND LILY CHOW

AMANDA MARIE KRIARIS

ZACHARY LEWIS HALL DARIN S. LEIGH

EARNEST B. III AND JENNIFER N. GOODRICH

SREENIVAS VEMULAPALLI AND SRIVALLI DONTHINENI

TUSHAR AND LEENA BAJAJ

CHANDRA YELLAPANTULA AND HARINATH APPANI

ROBERT AND COLLEEN BALES

ZACHARY IDARGATZ AND KRISTEN KNIGHT

220 TOWN OF HOLLY SPRINGS

219 ARBOR CREEK KS, LLC

WETLAND WS

HOLLY SPRINGS GREENWAY TRAIL

MIDDLE CREEK

CURRIN BROS., INC.

26 THE MATA FAMILY, LLC

221 BNRICH, LLC

???

TOE PROTECTION SEE DETAIL 38A

CL B RIPRAP

INLET CHANNEL SEE DETAIL 54A

OUTLET CHANNEL SEE DETAIL 54A

LAT 2' BASE DITCH w/CL I RIPRAP SEE DETAIL 20A

RETAIN

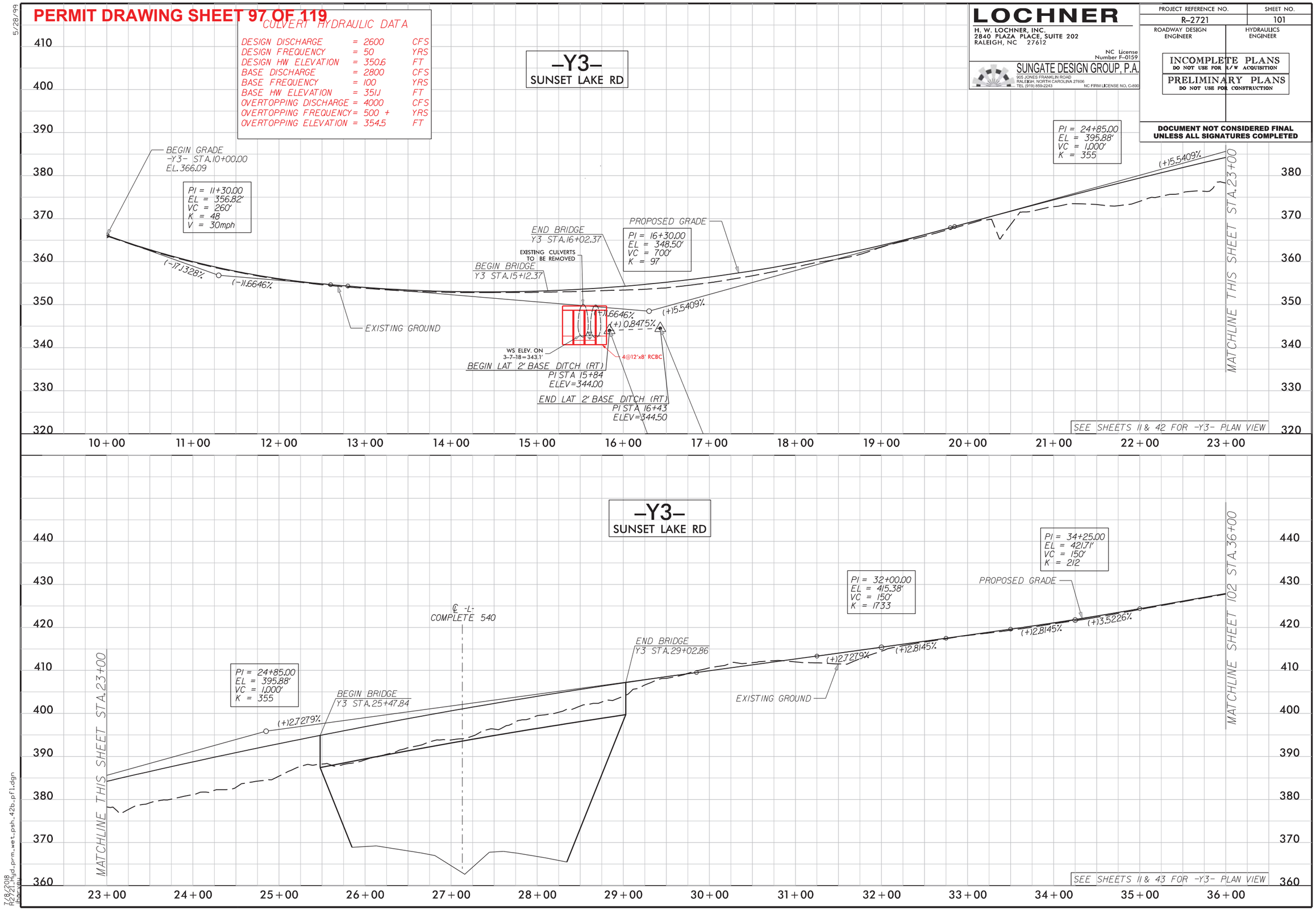
REMOVE

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

MATCHLINE SHEET 11
-Y3- STA 22+00.00

SEE SHEET 2B-27 FOR BRIDGE SKETCH | SEE SHEET 101 FOR -Y3- PROFILE

7/8/2018
R2721_hyd_prm_wet_psh_42a.dgn
lhoover



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RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
NC FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
R-2721	101
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

5/28/99

7/8/2018
R2721_Hyd_prm_wet_psh_42b_pfl.dgn
jbarvey

6/23/16

PERMIT DRAWING SHEET 98 OF 119

0 5 10

PROJ. REFERENCE NO.	SHEET NO.
R-2721	X-659

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

360 350 340

SITE 44

2:1 0.005 353.40 0.020 2:1

16+00.00

IMPACTS IN SURFACE WATER (SO)

2:1 0.006 353.07 0.020 2:1

IMPACTS IN SURFACE WATER (SO)

15+50.00

2:1 0.018 352.87 0.020 2:1

WETLAND

15+00.00

SITE 42

FILL IN WETLAND (WS)

WETLAND 3:1 0.030 352.83 0.030 WETLAND

(WS) FILL IN WETLAND 2:1

SITE 43

14+50.00

FILL IN WETLAND (WS)

WETLAND 3:1 0.040 352.85 0.040 WETLAND 2:1

SITE 43

FILL IN WETLAND (WS)

14+00.00

FILL IN WETLAND (WS)

WETLAND 3:1 0.040 353.14 0.040 WETLAND

(WS) FILL IN WETLAND 4:1

13+50.00

-Y3-

7/8/2018
R2721_Hgd_prm_wet_psh_42c_xpl.dgn
jharvey

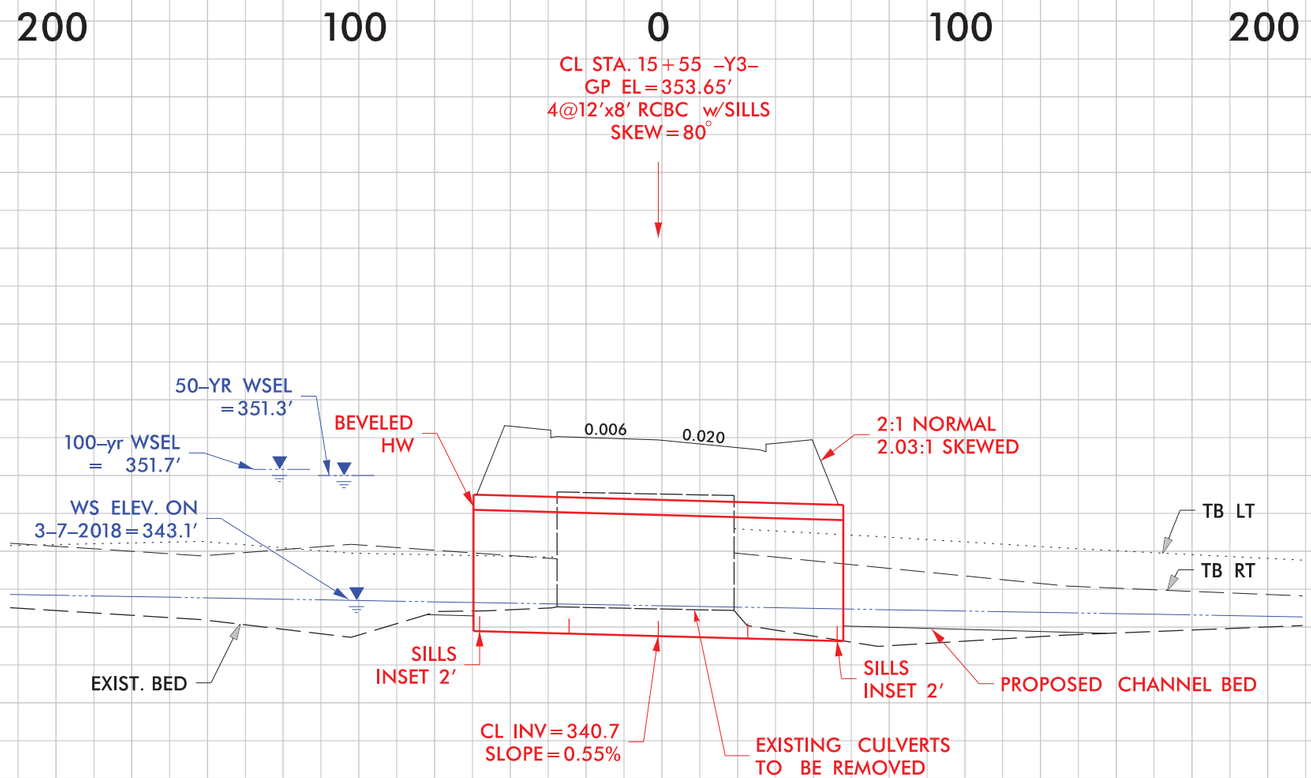
5/14/99

PERMIT DRAWING SHEET 99 OF 119

PROJECT REFERENCE NO.	SHEET NO.
R-2721	42D
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



7/8/2018
R2721_hyd_prm_wet_psh_42d_sec.dgn
barvej

PERMIT DRAWING SHEET 100 OF 119

51499

50′ 25′ 0 50′ 100′
SCALE: 1″=100′

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
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RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 NC FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
R-2721	46
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83

PAVEMENT REMOVAL
PAVED SHOULDER
PROPOSED SIGNAL

BEGIN CONSTRUCTION
-Y5D- STA. 10+00.00
-Y5D- POT Sta. 10+00.00

BEGIN CONSTRUCTION
-Y5- STA. 11+58.52

-Y5- PT Sta. 19+04.92
-Y5- PC Sta. 17+93.07
-Y5I- PC Sta. 11+45.25
-Y5D- POT Sta. 12+65.36
-Y5I- POT Sta. 10+00.00
Δ = 89°37'43.7"

WETLAND WAG

SITE 45
SITE 46
SITE 47

STREAM SX

AMERICAN PROPERTIES HOLDINGS LLC
PARMINDER AND PARDEEP SANDHAR
CVS 5886 NC LLC
SIV-J LLC
TOWN OF HOLLY SPRINGS SANITARY SEWER EASEMENT BM 2004 PG 446
20' TOWN OF HOLLY SPRINGS SANITARY SEWER EASEMENT DB 8688 PG 116
J&D PEACOCK PROPERTIES LLC
UNKNOWN
PAULINE FRAZIER
LOCKHOLLY LLC
BETTY AND EARLIE MOORE
DONALD AND MARGARET MCNEILL
CREEK CLUB, LTD
ROSEN HOLLY SPRINGS II LLC
ROSEN HOLLY SPRINGS LLC
JORDAN REAL ESTATE HOLDINGS LLC
TA PROPERTIES LLC
WADE & ORA BURT
WILLIAM & WADE BURT
VARIABLE WIDTH TOWN OF HOLLY SPRINGS UTILITY EASEMENT BM 2005 PG 1874
VARIABLE WIDTH TOWN OF HOLLY SPRINGS SANITARY SEWER EASEMENT DB 8688 PG 116 BM 2005 PG 1874
PERMANENT DRAINAGE EASEMENT W/ BM 2006 MS 951
PERMANENT DRAINAGE EASEMENT BM 2006 PG 458

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

MATCHLINE SHEET 47
-Y5- STA 24+00.00

MATCHLINE SHEET 50
-Y5I- STA 13+00.00

SEE SHEET 103 FOR -Y5- PROFILE
SEE SHEET 106 FOR -Y5D- PROFILE
SEE SHEET 108 FOR -Y5I- PROFILE

782018
782072_Hyd_prm_wet_pah_46.dgn
lhoover

PERMIT DRAWING SHEET 101 OF 119

51499

50' 25' 0 50' 100'

SCALE: 1"=100'

LOCHNER

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PROJECT REFERENCE NO.	SHEET NO.
R-2721	46
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83

PAVEMENT REMOVAL
PAVED SHOULDER
PROPOSED SIGNAL

AMERICAN PROPERTIES HOLDINGS LLC
PARMINDER AND PARDEEP SANDHAR
CVS 5886 NC LLC
SIV-J LLC
CREEK CLUB, LTD
ROSEN HOLLY SPRINGS II LLC
ROSEN HOLLY SPRINGS LLC
JORDAN REAL ESTATE HOLDINGS LLC
J&D PEACOCK PROPERTIES LLC
UNKNOWN
PAULINE FRAZIER
LOCKHOLLY LLC
BETTY AND EARLIE MOORE
DONALD AND MARGARET MCNEILL
TA PROPERTIES LLC TA PROPERTIES LLC TA PROPERTIES LLC
WADE & DRAU BURT
WILLIAM & WADE BURT

BEGIN CONSTRUCTION
-Y5- STA. 10+00.00
-Y5D- POT Sta. 10+00.00

BEGIN CONSTRUCTION
-Y5- STA. 11+58.52

-Y5- PT Sta. 19+04.92
-Y5- PC Sta. 17+93.07
-Y5- PC Sta. 11+45.25
-Y5D- POT Sta. 12+65.36
-Y5D- POT Sta. 12+67.79
-Y5I- POT Sta. 10+00.00
Δ = 89°37'43.7"

WETLAND WAG
WETLAND WAH
STREAM SX

SITE 45
SITE 46
SITE 47

TS
S

20' TOWN OF HOLLY SPRINGS SANITARY SEWER EASEMENT DB 8688 PG 116

VARIABLE WIDTH TOWN OF HOLLY SPRINGS UTILITY EASEMENT BM 2005 PG 1874

20' TOWN OF HOLLY SPRINGS SANITARY SEWER EASEMENT DB 8688 PG 116 BM 2005 PG 1874

PERMANENT DRAINAGE EASEMENT W/ BM 2006 PG 351

PERMANENT DRAINAGE EASEMENT DB 8688 PG 116

INLET CHANNEL SEE DETAIL 55A
TOE PROTECTION SEE DETAIL 38A
LAT 4' BASE DITCH w/CL I RIPRAP SEE DETAIL 33A
OUTLET CHANNEL SEE DETAIL 55A
CL B RIPRAP
RETAIN
REMOVE
SPEC BACK OF CURB CUT DITCH SEE DETAIL 16A

MATCHLINE SHEET 47
-Y5- STA 24+00.00

MATCHLINE SHEET 50
-Y5I- STA 13+00.00

DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SEE SHEET 103 FOR -Y5- PROFILE
SEE SHEET 106 FOR -Y5D- PROFILE
SEE SHEET 108 FOR -Y5I- PROFILE

7/8/2018
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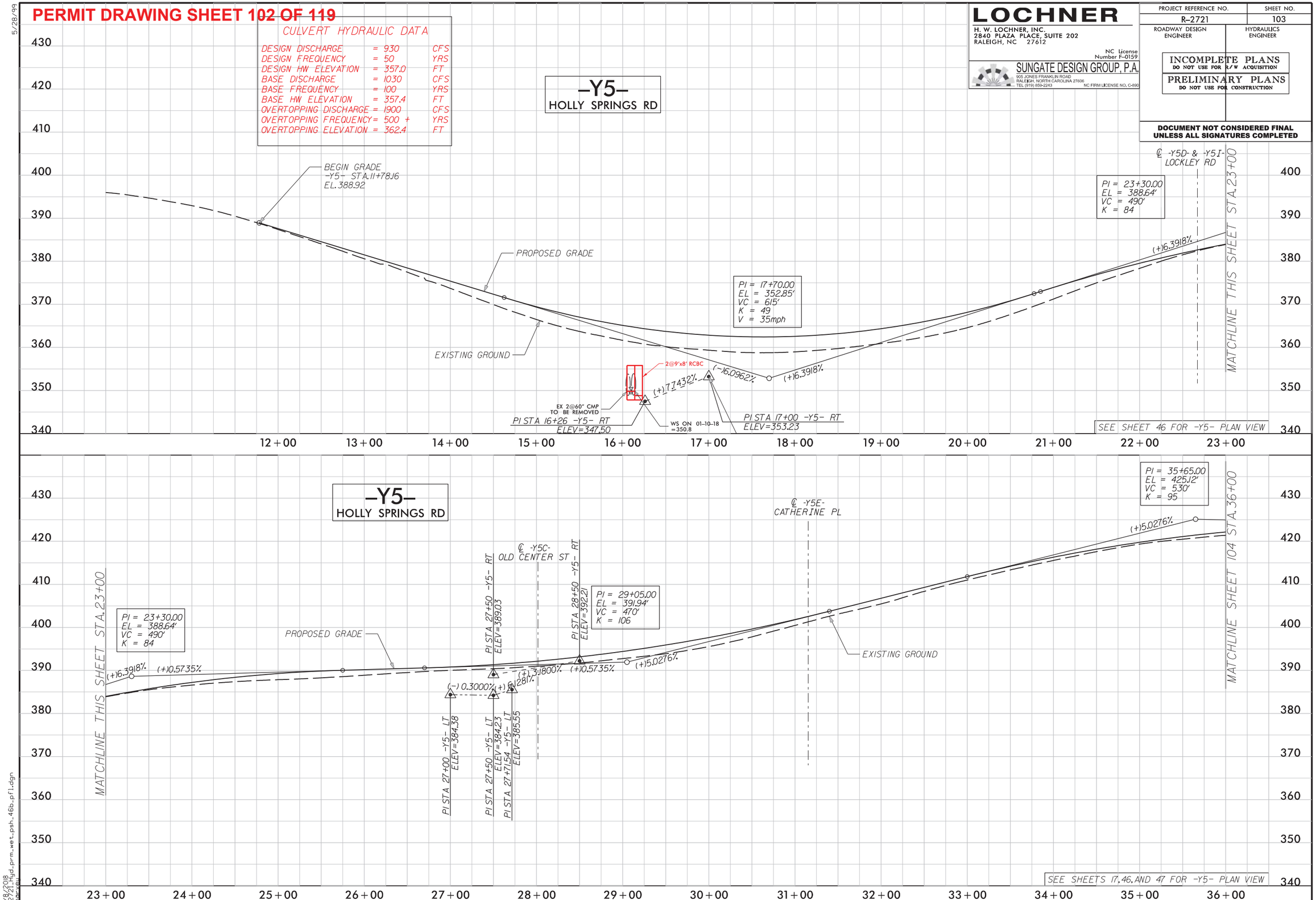
lhorvey

PERMIT DRAWING SHEET 102 OF 119

5/28/99



LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159
SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
NC FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
R-2721	103
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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jbarvey

6/23/16

PERMIT DRAWING SHEET 103 OF 119

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	R-2721	X-678

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

370 360 380 370 360 350 380 370 360 350 380 370 360 350

SITE 46

WETLAND WETLAND

(WAG) FILL IN WETLAND

3:1 0.020 0.020 3:1

360.18

16+50.00

SITE 45

IMPACTS IN SURFACE WATER (SX)

IMPACTS IN SURFACE WATER (SX)

3:1 0.020 0.020 3:1

361.66

16+00.00

3:1 0.020 0.020 3:1

363.70

15+50.00

3:1 0.020 0.020 3:1

366.48

15+00.00

3:1 0.020 0.020 3:1

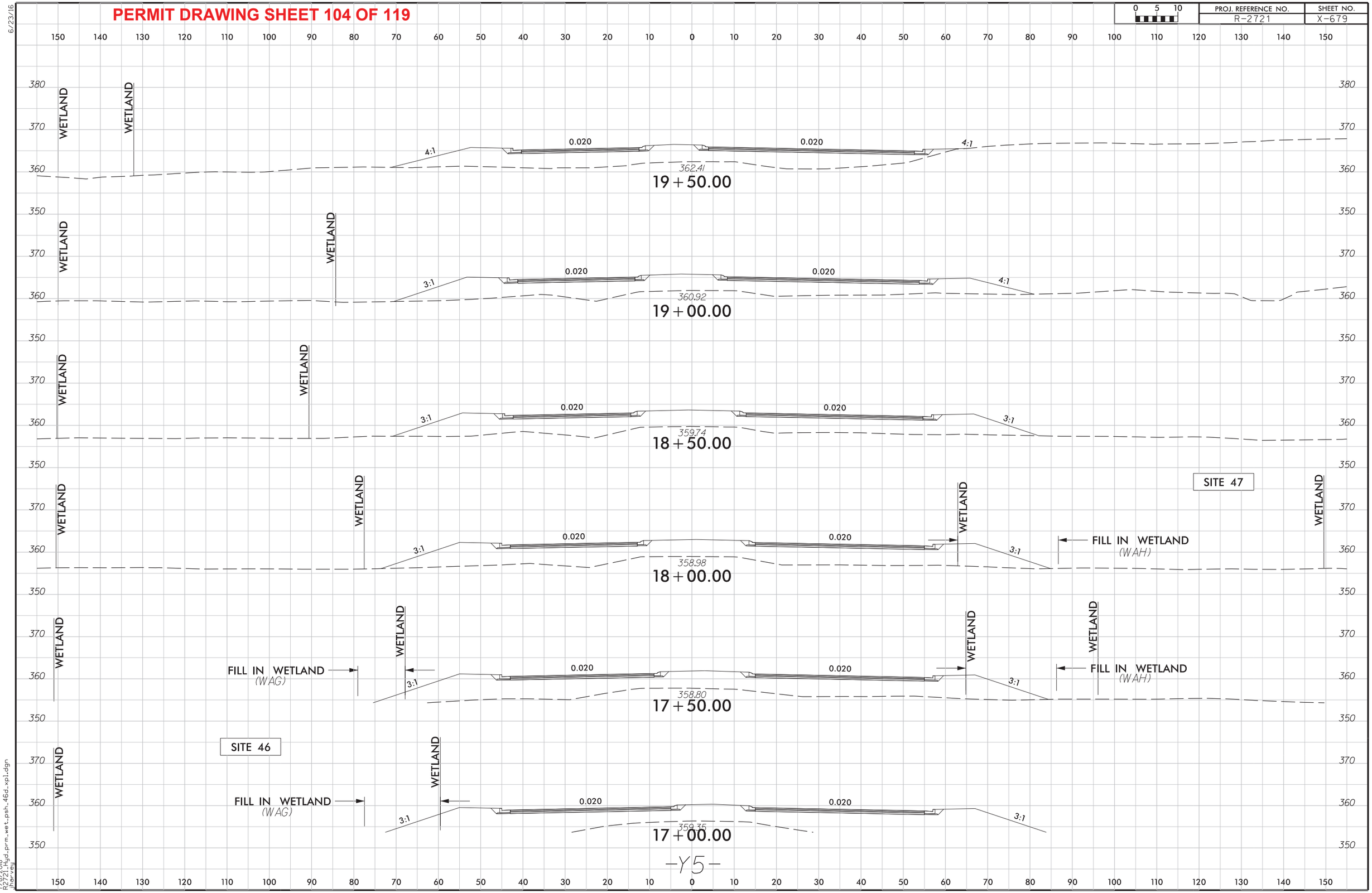
369.96

14+50.00

-Y5-

150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

7/9/2018
R2721_hyd_prm_wet_psh_46c_xpl.dgn
jharvey

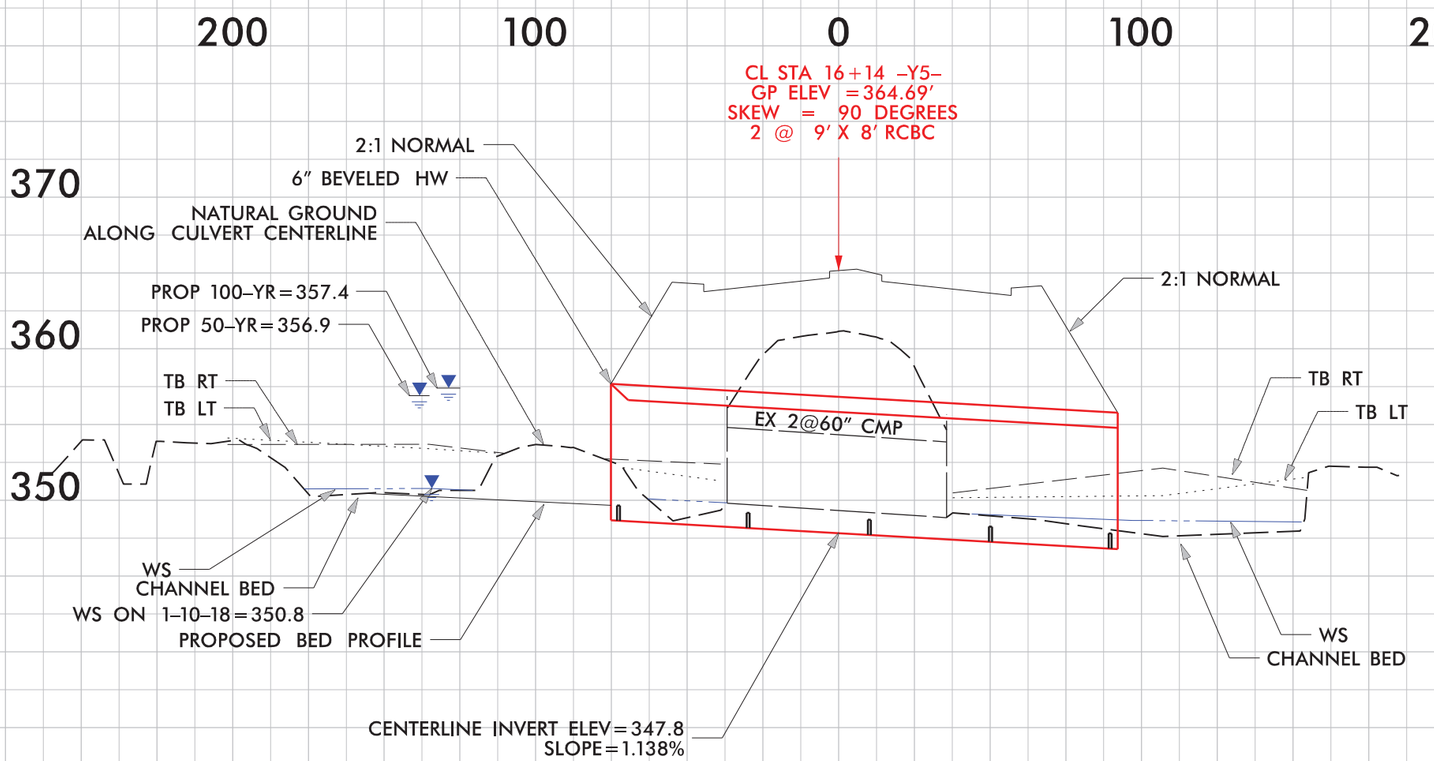

PERMIT DRAWING SHEET 104 OF 119
PROJ. REFERENCE NO.
R-2721
SHEET NO.
X-679
WETLAND
0.020
4:1
362.41
19+50.00
3:1
360.92
19+00.00
359.74
18+50.00
SITE 47
FILL IN WETLAND
(WAH)
358.98
18+00.00
FILL IN WETLAND
(WAG)
358.80
17+50.00
SITE 46
359.35
17+00.00
-Y5-

PERMIT DRAWING SHEET 105 OF 119

PROJECT REFERENCE NO.	SHEET NO.
R-2721	46D
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



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7/8/2018
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jbarvey

PERMIT DRAWING SHEET 106 OF 119

51499

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′

LOCHNER

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RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
NC FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
R-2721	48
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT REMOVAL
PAVED SHOULDER
PROPOSED SIGNAL

MATCHLINE SHEET 51
-Y5A- STA 14+00.00

NAD 83

TAIL DITCH w/CL I RIPRAP SEE DETAIL 9

BURY INVERT 0.3 FT

LAT 2' BASE DITCH w/CL B RIPRAP SEE DETAIL 4A

BACKFILL TO NG EL 404

LAT 4' BASE DITCH w/CL I RIPRAP SEE DETAIL 7A

-Y5SB- PRC Sta. 23+31.80

-Y5- PC Sta. 27+08.63

-Y5- PT Sta. 29+47.46

WETLAND WAJ

STREAM SAB

SITE 48

SITE 35

E&M JOHNSON ENTERPRISES INC

DONALD ANDREWS

-Y5A- PC Sta. 11+08.85

-Y5- POC Sta. 49+50.25=
-Y5SB- PT Sta. 23+80.55
35.50' LSITE 35

-Y5- PCC Sta. 50+36.92

-Y5- POC Sta. 56+56.61=
-Y5A- POT Sta. 10+00.00
-Y5B- POT Sta. 10+00.00
Δ = 90°45'17.65"

-Y5- PT Sta. 57+23.62

-Y5- PC Sta. 60+93.81

-Y5- POC Sta. 61+59.05=
-Y5A- POT Sta. 14+00.00
-Y5B- POT Sta. 14+00.00
Δ = 153°02'01.5"

-Y5B- PT Sta. 14+61.01
S 44°15'54.9" E
-Y5B- POT Sta. 14+86.41

END CONSTRUCTION
-Y5B- STA. 14+37.50

MATCHLINE SHEET 17
-Y5- STA 49+00.00

MATCHLINE SHEET 49
-Y5- STA 62+00.00

283 CHARLES AND KOREA DUNCAN

284 WILLIE WATSON

285 JOHN MITCHELL

286 JOHN DAVITT
KEITH AND CONNIE HARSHMAN

287 ROLAND AND ANITA TAYLOR

288 MICHAEL FINNERTY

289 JEFFERY AND GAIL SANDERS

290 MICHAEL AND LAURIE PARKER

291 JAMES HAMPTON, JR.

292 AMY AND DAVID PATTERSON

414 JOSEPH AND NANCY MACK

420 GARRY RICHTER

ERIC PETTY

STEVEN AND MICHELLE LESLIE

MANUEL AND LISA SUAREZ

JOSEPH CICHOCKI

SR 1150 HOLLY SPRINGS RD 23.5' BST

SR 3922 ASHWILL CT 17' BST

SR 1152 HOLLY SPRINGS RD 23' BST

SEE SHEET Y5 FOR -104- PROFILE
SEE SHEET Y5A FOR -105- PROFILE
SEE SHEET Y5B FOR -1056- PROFILE

7827018
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thomas

PERMIT DRAWING SHEET 107 OF 119

51499

F E — 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′

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RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
NC FIRM LICENSE NO, C-890

PROJECT REFERENCE NO.	SHEET NO.
R-2721	48
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT REMOVAL
PAVED SHOULDER
PROPOSED SIGNAL

NAD 83

MATCHLINE SHEET 51
-Y5A- STA 14+00.00

MATCHLINE SHEET 17
-Y5-STA 49+00.00

MATCHLINE SHEET 49
-Y5- STA 62+00.00

-Y5A- PC Sta. 11+08.85

-Y5A- PT Sta. 23+78.80

-Y5B- PC Sta. 23+78.80

-Y5- PC Sta. 60+93.81

-Y5- PT Sta. 57+23.62

-Y5- POC Sta. 49+50.25=
-Y5SB- PT Sta. 23+80.55
35.50' LT

-Y5- PCC Sta. 50+96.92

-Y5- POC Sta. 56+56.61=
-Y5A- POT Sta. 10+00.00
-Y5B- POT Sta. 10+00.00
Δ = 90°45'17.65"

-Y5B- PT Sta. 14+61.01
S 44°15'54.9"E
-Y5B- POT Sta. 14+86.41

END CONSTRUCTION
-Y5B- STA. 14+37.50

SITE 48 — SITE 35 — SITE 35

WETLAND WAJ

STREAM SAB — STREAM SAB

TAIL DITCH w/CL RIPRAP SEE DETAIL 9

LAT 2 BASE DITCH w/CL RIPRAP SEE DETAIL 7A

LAT 2 BASE DITCH w/CL RIPRAP SEE DETAIL 4A

LAT 2 BASE DITCH w/CL RIPRAP SEE DETAIL 10A

BURY INVERT 0.3 FT

BACKFILL TO NG EL 404

ADDITIONAL RIGHT OF WAY REQUIRED BY DEED BOOK 1985 PG 2

ADDITIONAL RIGHT OF WAY REQUIRED BY DEED BOOK 1985 PG 2

284	WILLIE WATSON
420	GARRY RICHTER
414	JOSEPH AND NANCY MACK
283	CHARLES AND KOREA DUNCAN
285	JOHN MITCHELL
282	DONALD ANDREWS
288	MICHAEL FINNERTY
287	ROLAND AND ANITA TAYLOR
286	JOHN DAVITT / KEITH AND CONNIE HARSHMAN
289	JEFFERY AND GAIL SANDERS
290	MICHAEL AND LAURIE PARKER
291	JAMES HAMPTON, JR.
292	AMY AND DAVID PATTERSON
	ERIC PETTY
	STEVEN AND MICHELLE LESLIE
	MANUEL AND LISA SUAREZ
	JOSEPH CICHOCKI

SR 3922 ASHWILL CT (T) BST

SR 3922 HOLLY SPRINGS RD 235 BST

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEE SHEET Y5 FOR -I04- PROFILE
SEE SHEET Y5A FOR -I05- PROFILE
SEE SHEET Y5B FOR -I056- PROFILE

7822018
R-2721_hyd_prm_wet_psh_48a.dgn
lhorney

6/23/16

PERMIT DRAWING SHEET 108 OF 119

0 5 10

PROJ. REFERENCE NO.	SHEET NO.
R-2721	X-696

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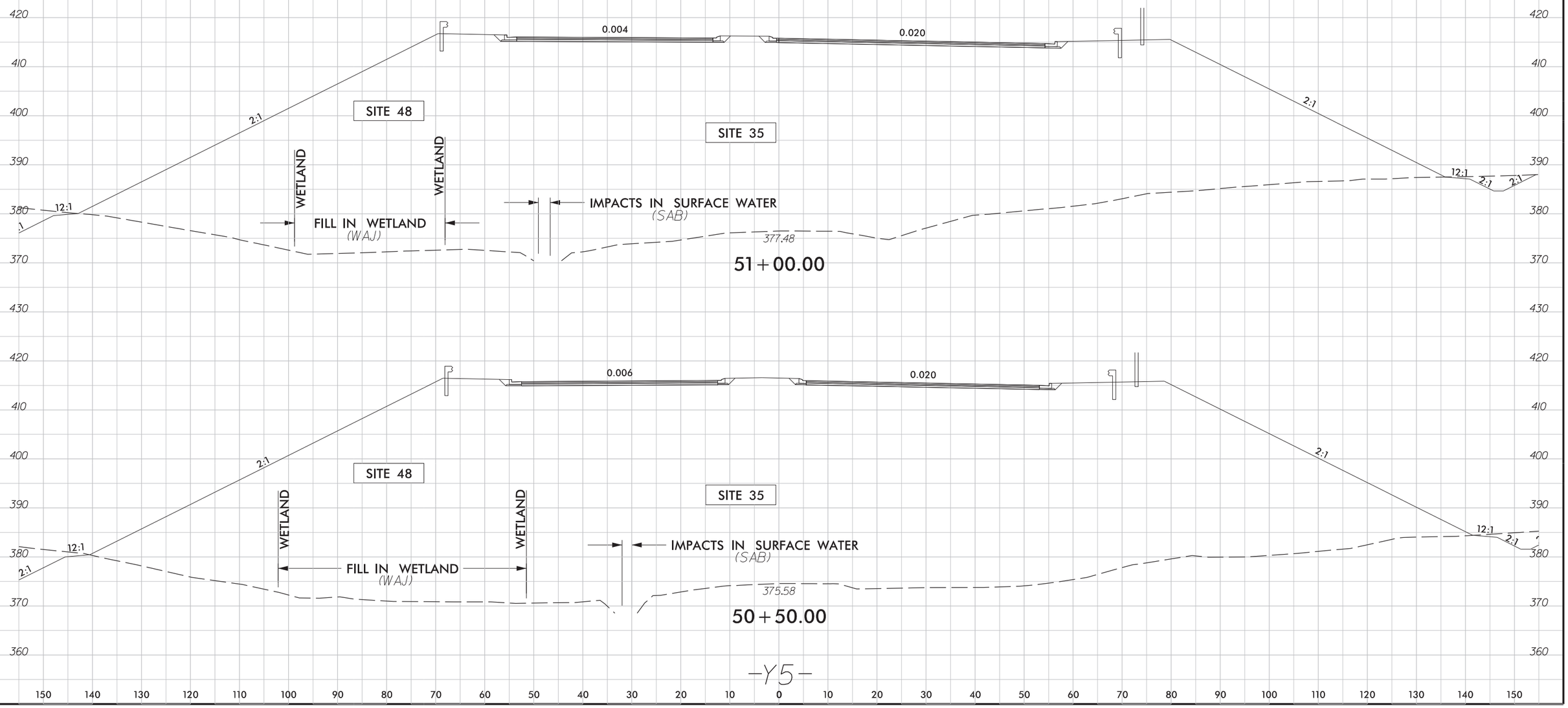
430 420 410 400 390 380 370 360



-Y5-

7/9/2018
R2721Hyd_prm_wet_psh_48b_xpl.dgn
jharvey

PERMIT DRAWING SHEET 109 OF 119

51499

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

NAD 83

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 NC FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
R-2721	49
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT REMOVAL
PAVED SHOULDER

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

-Y5G- PT Sta. 12+43.82

BEGIN CONSTRUCTION
-Y5G- STA. 12+87.50

-Y5G- PC Sta. 13+47.56

-Y5- PT Sta. 16+46.29

-Y5- POC Sta. 62+65.48=
-Y5G- POT Sta. 17+33.87
Δ = 87°04'50"

-Y5- PT Sta. 70+54.06

-Y5- POT Sta. 72+73.53

END CONSTRUCTION
SITE 50 -Y5- STA. 72+50.00

SITE 49

MATCHLINE SHEET 48
-Y5- STA 62+00.00

BRIAN AND ANNAMARY CHURCH
BRYANT AND VICTORIA PERDUN
GEORGE AND CYNTHIA HARDIN
SECU*RE INC
JOSEPH AND NANCY MACK
JOHN MITCHELL
KATHERINE KALEY
ALAN AND JENNIFER CLEGG
AQUA NORTH CAROLINA
WELL LOT #2
PUMP STATION
WILLIAM AND BETSY HINE
GARY AND JEAN WINGLER
RUSSELL MILLER AND KIMBERLY KORB
HALLMARK INVESTORS
STREAM SEE
CHARLES AND LINDA PULLIAM
SILAS AND EVON WARD
JAMES HAMPTON, JR.
ST MARYS BAPTIST CHURCH

20' DRAINAGE EASEMENT BM 1985 PG 1289
20' ACCESS EASEMENT BM 1985 PG 1794
APPROXIMATE LOCATION OF 30' DRAINAGE EASEMENT SCALED FROM BM 1986 PG 1040

SR 1152 HOLLY SPRINGS RD 2 WAY BST
65.00'
N 55°02'17" E
70+00

INLET CHANNEL SEE DETAIL 56A
LAT 2' BASE DITCH w/CL B RIPRAP SEE DETAIL 4A
LAT V-DITCH w/CL B RIPRAP SEE DETAIL 22A
SPEC CUT V-DITCH SEE DETAIL 3A
OUTLET CHANNEL SEE DETAIL 56A
DITCH BLOCK
CL B RIPRAP
REMOVE
RETAIN

SEE SHEET 105 FOR -Y5- PROFILE
SEE SHEET 107 FOR -Y5G- PROFILE

7/9/2018
R2721_Hyd_prm_wet_psh_49.dgn
lhaney

51499

PERMIT DRAWING SHEET 110 OF 119

50′ 25′ 0 50′ 100′
SCALE: 1″ = 100′

NAD 83

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 NC FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
R-2721	49
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT REMOVAL
PAVED SHOULDER

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

-Y5G- PT Sta. 12+43.82
BEGIN CONSTRUCTION
-Y5G- STA. 12+87.50

-Y5G- PC Sta. 13+47.58

-Y5- PT Sta. 16+46.29

-Y5- POC Sta. 62+62.48
-Y5G- POT Sta. 17+33.87
Δ = 87°04'30"

-Y5- POT Sta. 72+73.53

-Y5- POT Sta. 70+54.06

END CONSTRUCTION
SITE 50 -Y5- STA. 72+50.00

SITE 49

MATCHLINE SHEET 48
-Y5- STA 62+00.00

BRIAN AND ANNAMARY CHURCH
BRYANT AND VICTORIA PERDUN
GEORGE AND CYNTHIA HARDIN
SECURE INC
ALAN AND JENNIFER CLEGG
WILLIAM AND BETSY HINE
GARY AND JEAN WINGLER
JOSEPH AND NANCY MACK
JOHN MITCHELL
KATHERINE KALEY
AQUA NORTH CAROLINA
HALLMARK INVESTORS
RUSSELL MILLER AND KIMBERLY KORB
CHARLES AND LINDA PULLIAM
SILAS AND EVON WARD
JAMES HAMPTON, JR.
ST MARYS BAPTIST CHURCH

STREAM SEI
STREAM SEE

20' ACCESS EASEMENT BM 1985 PG 1794
20' DRAINAGE EASEMENT BM 1985 PG 1288
APPROXIMATE LOCATION OF 30' DRAINAGE EASEMENT SCALED FROM BM 1986 PG 1040

65.00' HOLLY SPRINGS RD SR 1152
70.00' SR 1152 HOLLY SPRINGS RD

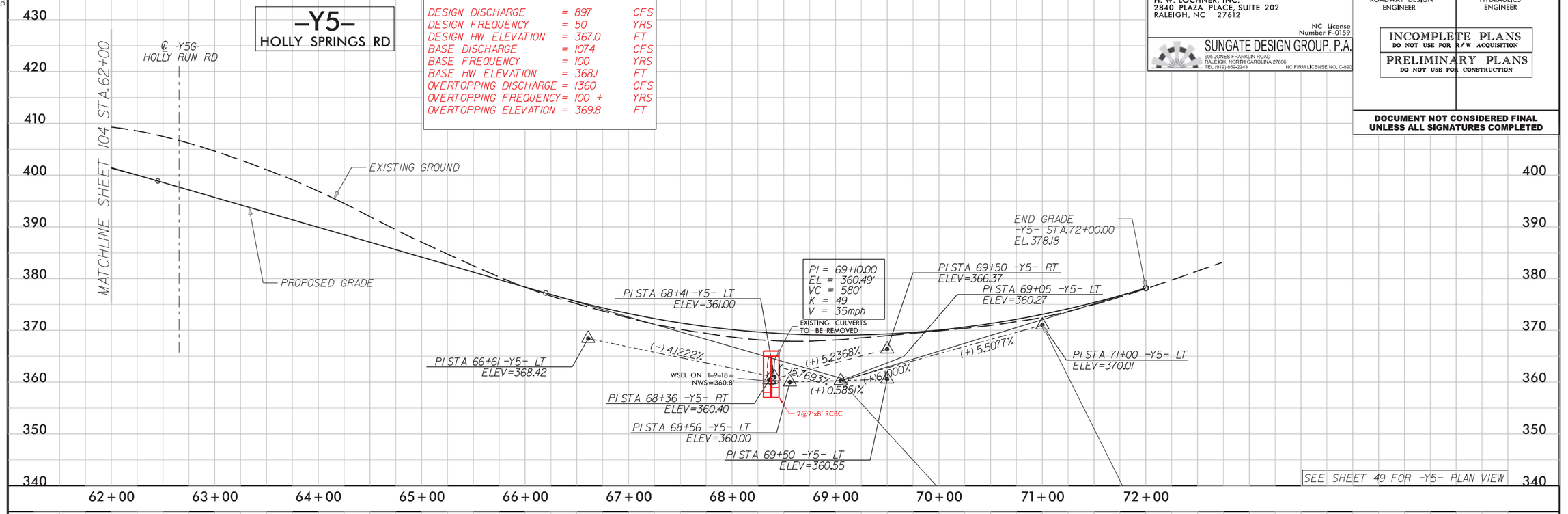
INLET CHANNEL SEE DETAIL 56A
OUTLET CHANNEL SEE DETAIL 56A
LT 2' BASE DITCH w/CL B RIPRAP SEE DETAIL 4A
LAT V-DITCH w/CL B RIPRAP SEE DETAIL 22A
SPEC CUT V-DITCH SEE DETAIL 3A
CL B RIPRAP
DITCH BLOCK
RETAIN
REMOVE
2@7'x 5' RCBC
48" RCP
15" RCP
18" RCP
24" RCP
RIP RAP
BRICK WALL
CONC
POOL
ISFD
GR

SEE SHEET 105 FOR -Y5- PROFILE
SEE SHEET 107 FOR -Y5G- PROFILE

7/2/2018
R2721_hyd_prm_wet_psh_49a.dgn
jhardee

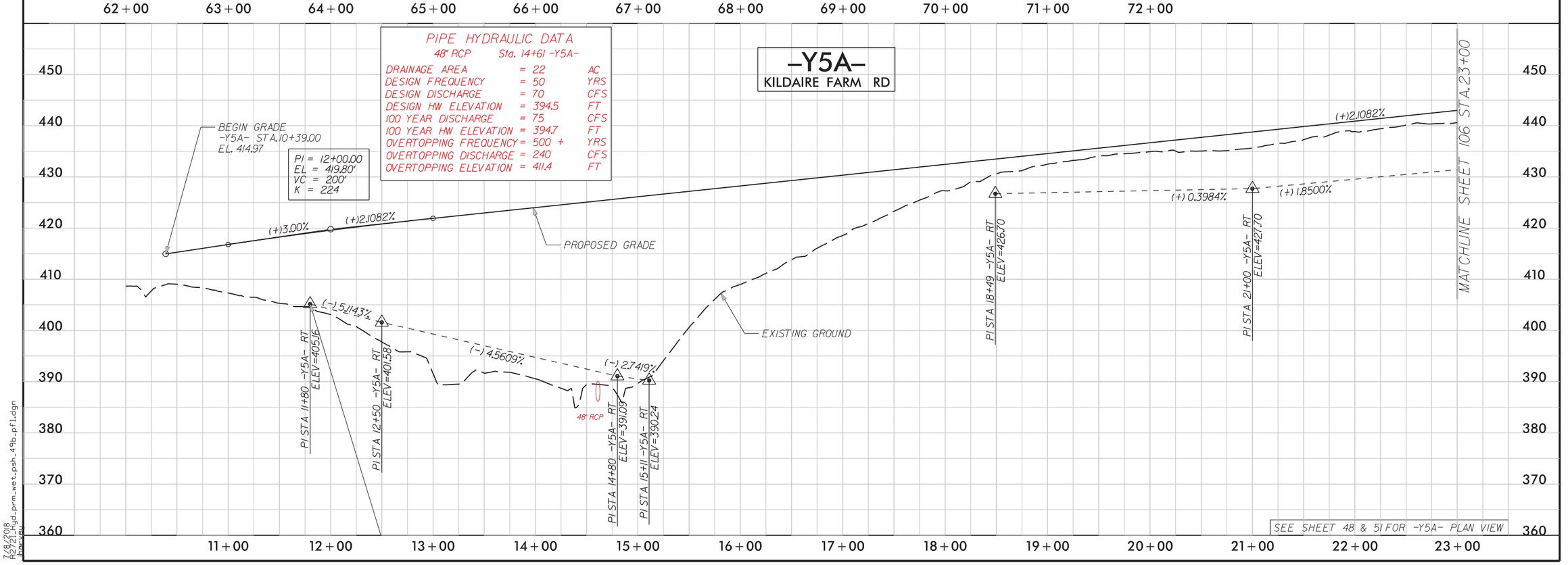
PERMIT DRAWING SHEET 111 OF 119

5/28/99



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	= 369.8	FT



PIPE HYDRAULIC DATA

48" RCP Sta. 14+61 -Y5A-

DRAINAGE AREA	= 22	AC
DESIGN FREQUENCY	= 50	YRS
DESIGN DISCHARGE	= 70	CFS
DESIGN HW ELEVATION	= 394.5	FT
100 YEAR DISCHARGE	= 75	CFS
100 YEAR HW ELEVATION	= 394.7	FT
OVERTOPPING FREQUENCY	= 500 +	YRS
OVERTOPPING DISCHARGE	= 240	CFS
OVERTOPPING ELEVATION	= 411.4	FT

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RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
NC FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
R-2721	105
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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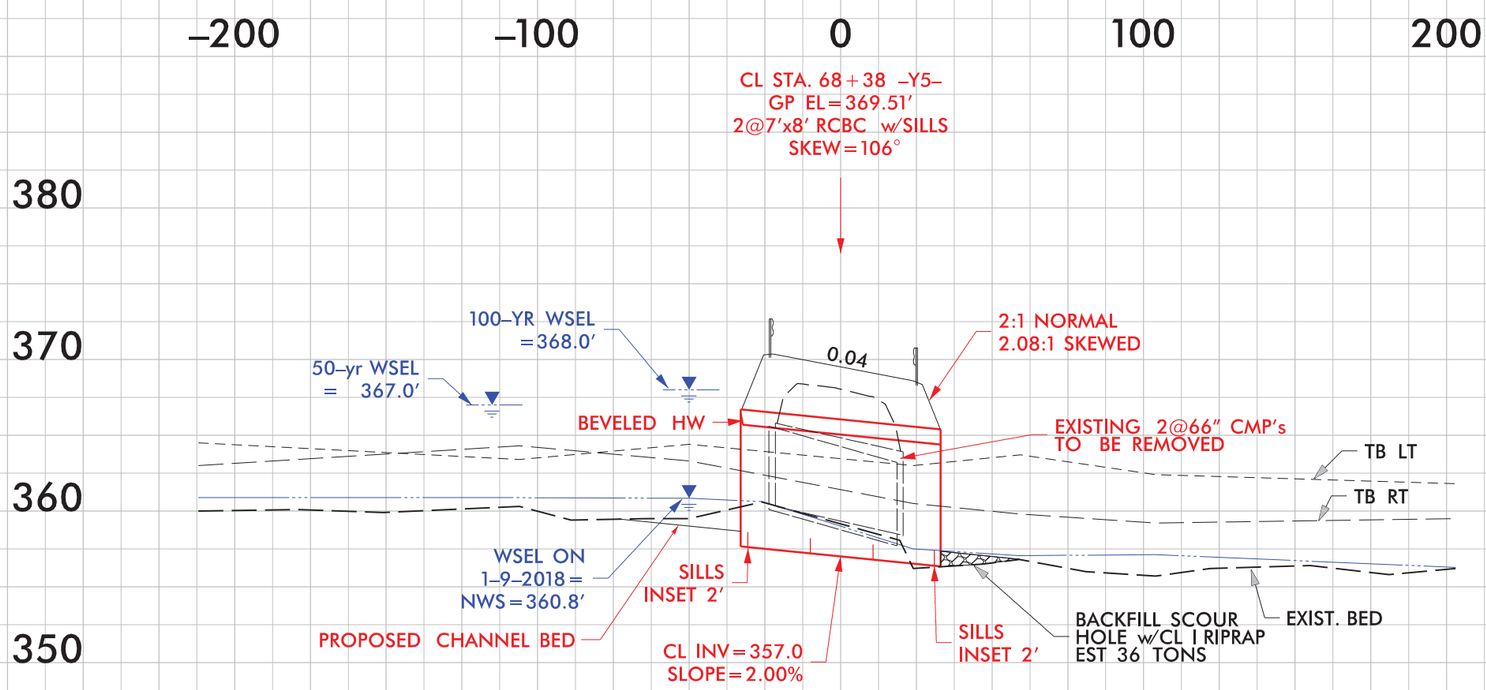
jbarvey

PERMIT DRAWING SHEET 112 OF 119

PROJECT REFERENCE NO.	SHEET NO.
R-2721	49C
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

7/8/2018
R2721_Hyd_prm_wet_psh_49c_sec.dgn
jharvey

51499

PERMIT DRAWING SHEET 113 OF 119

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

61
E&M JOHNSON ENTERPRISES INC

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

NAD 83

SR 1300 KILDAIRE FARM RD

-Y5A- PC Sta. 17+59.57

-Y5H- PC Sta.13+10.29

-Y5A- POC Sta.23+63.53=
-Y5H- POT Sta.14+17.30
ALICE WATSON △ = 90°00'00"

-Y5H- N 46° 54' 39.9" E

-Y5A- N 84° 37' 06.3" W

-Y5A- PT Sta.14+83.08

-Y5K- POT Sta.12+49.55

-Y5K- N 8° 45' 36.0" E

-Y5A- POC Sta.26+48.64=
-Y5K- POT Sta.10+00.00
△ = 74°15'53.25"

MATCHLINE SHEET 48
-Y5A- STA 14+00.00

MATCHLINE SHEET 52
-Y5A- STA 27+00.00

SITE 35

WETLAND WAI

STREAM SAB

284 WILLIE WATSON

306 ALICE WATSON

308 THAMOTHARAMPILLAI SIVARAJ

309 IAN EAGER

310 NANCY WILSON

311 DAVID AND DONNA MCCALLUM

307 MEI QIN JIANG AND XING XIAN WANG

SHAHID AND MUMTAZ KHAN

MICHALE AND JANICE SPEARS

ERIC RAGONE AND RENE LATELLA

CHARLES AND ASHLEY BETTINI

DALLAS PERRY

ERNEST AND REBECCA KIRSTEIN

SCOTT AND ANGELA SOUDERS

HOLLY RUN SUBDIVISION

20+00

15+00

10+00

BURY INVERT 0.3 FT

HEAD DITCH w/CL I RIPRAP SEE DETAIL 43A

CL B RIPRAP

LAT 2' BASE DITCH w/CL B RIPRAP SEE DETAIL 4A

SPEC CUT V-DITCH SEE DETAIL 3A

SPEC LAT V-DITCH SEE DETAIL 3A

18" W/ 2 ELBOWS

JB w/MH

GRADE TO DRAIN (GTD)

RETAIN

PAVEMENT REMOVAL
PAVED SHOULDER

SEE SHEETS 105 & 106 FOR -Y5A- PROFILE
SEE SHEET 107 FOR -Y5H- PROFILE
SEE SHEET 108 FOR -Y5K- PROFILE

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PROJECT REFERENCE NO.	SHEET NO.
R-2721	51
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

51499

PERMIT DRAWING SHEET 114 OF 119

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

50′ 25′ 0 50′ 100′

SCALE: 1″=100′

NAD 83

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

NC License Number F-0159

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 NC FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
R-2721	51
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT REMOVAL
PAVED SHOULDER

SITE 35

WETLAND WAI

STREAM SAB

MATCHLINE SHEET 48 -Y5A- STA 14+00.00

MATCHLINE SHEET 52 -Y5A- STA 27+00.00

-Y5A- N 84° 37' 06.3" W

-Y5H- N 84° 24' 45.6" W

-Y5K- N 81° 45' 36.0" E

-Y5H- N 46° 34' 39.9" E

20+00

15+00

61 E&M JOHNSON ENTERPRISES INC

306 ALICE WATSON

308 THAMOTHARAMPILLAI SIVARAJ

309 NANCY WILSON

310 SCOTT AND ANGELA SQUIRES

307

311 DAVID AND DONNA MCCALLUM

284 WILLIE WATSON

MEI QIN JIANG AND XING XIAN WANG

JAWED AND MUMTAZ KHAN

IAN EAGER

MICHALE AND JANICE SPEARS

ERIC RACINE AND RENE LATELLA

CHARLES AND ASHLEY BETTINI

DALLAS PERRY

ERNEST AND REBECCA KIRSTEIN

SCOTSTOWNE LN

15" RCP-IV

18" RCP-IV

24" RCP-IV

18" W/ 2 ELBOWS

JB W/MH

HWD DITCH w/CL I RIPRAP SEE DETAIL 4A

CL B RIPRAP

LAT 2' BASE DITCH w/CL B RIPRAP SEE DETAIL 4A

SPEC CUT V-DITCH SEE DETAIL 3A

SPEC LAT V-DITCH SEE DETAIL 3A

BURY INVERT 0.3 FT

GRADE TO DRAIN (GTD)

RETAIN

PDE

PUE

DRAINAGE EASEMENT BM 1985 PG 1480

SEE SHEETS 105 & 106 FOR -Y5A- PROFILE
SEE SHEET 107 FOR -Y5H- PROFILE
SEE SHEET 108 FOR -Y5K- PROFILE

7/8/2018
R2721_Hyd_prm_wet_psh_51o.dgn
lhoover

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	19+20 to 19+73 -L-LT	CULVERT						< 0.01	< 0.01	33	13	
		BANK STABILIZATION						< 0.01		10		
2	21+67 to 21+88 -L-LT											
3	15+22 to 15+48-L-LT	18" RCP	< 0.01		< 0.01	< 0.01						
4	40+79 to 41+93-L-RT	ROADWAY FILL	0.02									
		POND						0.21				
5	48+93 to 49+78-L-RT	ROADWAY FILL	0.05			0.02						
6	51+88 to 57+81 -L-	48" RCP	1.53		0.06	0.02		0.02	< 0.01	463	10	
7	59+48 to 60+08-L-	30" RCP						< 0.01	< 0.01	372	16	
8	65+38 to 79+49-L-	ROADWAY FILL						0.20	< 0.01	2302	52	
		STABILIZATION						< 0.01		64		
9	67+37 to 70+18-L-LT	ROADWAY FILL	0.27		< 0.01							
10	70+21 to 71+41-L-	30" RCP						< 0.01	< 0.01	249	10	
		STABILIZATION						< 0.01		13		
11	72+73 to 73+27-L-LT	ROADWAY FILL	0.08		0.03							
12	78+77 to 81+29-L-	ROADWAY FILL	0.48			0.03						
13	81+22 to 82+31-L-LT	ROADWAY FILL	0.17			0.01						
14	81+79 to 86+58-L-	BANK STABILIZATION						< 0.01	< 0.01	57	14	
14A	84+63 to 85+46-L-LT	ROADWAY FILL						0.01	< 0.01	231	15	
15	85+31 to 90+05-L-	ROADWAY FILL	1.73		0.01	0.09		< 0.01	< 0.01	33		
16	108+50 to 110+35-L-	ROADWAY FILL			0.67							
17	115+55 to 116+13 -L-RT	ROADWAY FILL	0.11			0.01						
18	125+08 to 127+71L-L	1@6'x8' RCBC	0.83		0.06	0.06		0.01	< 0.01	273	21	
		STABILIZATION						< 0.01		81		
TOTALS*:			5.27		0.83	0.25		0.51	0.02	4181	151	0

*Rounded totals are sum of actual impacts

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

Revised 2018 Feb

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
7/9/2018
WAKE COUNTY
R-2721
6.401078

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)
18a	125+31 to 125+85-L-	ROADWAY FILL						< 0.01		91		
19	140+61 to 142+44 -L-	1@6'x8' RCBC	0.01		< 0.01	0.04		0.04	< 0.01	333	11	
		STABILIZATION						0.01		122		
20	146+74 to 147+84-L-	1@6'x8' RCBC	0.11		< 0.01	0.04		0.01	< 0.01	277	21	
		STABILIZATION						< 0.01		87		
21	146+88 to 147+06-L-LT	ROADWAY FILL			< 0.01	< 0.01						
22	148+14 to 149+02-L-RT	30" RCP						< 0.01	< 0.01	104	10	
23	148+41 to 141+82-L-RT	ROADWAY FILL			< 0.01	< 0.01						
24	149+11 to 155+85-L-	ROADWAY FILL	1.96		0.02	0.07						
25	162+84 to 164+50-L-RT	POND						0.40				
26	165+94 to 168+54 -L-	ROADWAY FILL	1.24			0.08						
27	168+51 to 169+40-L-	2@9'x8' RCBC				0.02		0.06	< 0.01	314	36	
		STABILIZATION						0.02		119		
28	172+97 to 173+41-L-RT	ROADWAY FILL	< 0.01			< 0.01						
29	173+60 to 176+39-L-LT	POND						1.53				
30	174+63 to 181+12-L-	ROADWAY FILL	1.42			0.04		0.01	< 0.01	251	10	
31	193+15 to 197+24-L-	ROADWAY FILL	0.20					0.04		872		
32	199+29 to 200+06-L-LT	ROADWAY FILL	0.04									
33	47+12 to 48+74 -Y5-LT	66" RCP	0.33		0.05	0.03		< 0.01	< 0.01	251	9	
34	23+30 to 24+76-YRRPB-LT	18" CSP	0.12		0.01	0.52						
35	47+58 to 49+64-Y5-RT	ROADWAY FILL						0.03	< 0.01	304	24	
		STABILIZATION						< 0.01		35		
35	196+35 to 200+02-L-LT	ROADWAY FILL						0.06	< 0.01	409	21	
TOTALS*:			5.43		0.09	0.86		2.22	0.02	3569	142	0

*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
7/9/2018
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)
35	201+82 to 202+45-L-LT	ROADWAY FILL						< 0.01	< 0.01	66	12	
35	50+01-Y5- to 15+32-Y5A-	ROADWAY FILL/48" RCP	0.01		< 0.01	< 0.01						
		STABILIZATION						< 0.01		44		
36	202+26 to 206+22-L-	3@9'x8' RCBC						0.23	0.01	977	20	
		STABILIZATION						0.03		92		
37	202+42 to 205+59-L-RT	ROADWAY FILL	0.31		0.03	0.09						
38	209+59 to 211+77-L-	42" RCP	0.32		0.02	0.03		0.01	< 0.01	358	10	
		STABILIZATION						< 0.01		18		
39	225+15 to 226+55-L-	36" RCP	0.20		< 0.01	0.03		< 0.01	< 0.01	303	9	
		STABILIZATION						< 0.01		18		
40	225+72 to 227+98-L-	ROADWAY FILL	0.26		< 0.01	0.04			< 0.01		10	
41	29+83 to 30+17-Y1-RT	48" RCP						< 0.01	< 0.01	56	10	
42	13+07 to15+00-Y3-LT	ROADWAY FILL	0.06			< 0.01						
43	11+86 to 15+02-Y3-RT	ROADWAY FILL	0.19			0.07						
44	15+00 to 15+88-Y3-	4@12'x8' RCBC						0.03	0.02	58	30	
		STABILIZATION						0.07		123		
45	15+60 to 16+27-Y5-	2@9'x8' RCBC						0.04	0.01	211	41	
		STABILIZATION						0.03		102		
46	16+20 to 18+23-Y5-LT	ROADWAY FILL	0.07			0.03						
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						0.05	< 0.01	28		
		STABILIZATION						0.02		83		
TOTALS*:			1.56		0.05	0.33		0.52	0.05	2537	142	0

*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
7/9/2018
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)
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		
	TOTAL PAGE 112		5.27		0.83	0.25		0.51	0.02	4181	151	
	TOTAL PAGE 113		5.43		0.09	0.86		2.22	0.02	3569	142	
	TOTAL PAGE 114		1.56		0.05	0.33		0.52	0.05	2537	142	
TOTALS*:			12.25		0.97	1.44		3.26	0.09	10428	441	0

*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
7/9/2018
WAKE COUNTY
R-2721
6.401078

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	12+52 to 15+29-Y3DET-LT	ROADWAY FILL	0.38			0.07						
2	16+06 to 16+81-Y3DET-LT	ROADWAY FILL	0.09			0.02						
3	26+16 to 27+13-Y5DET-LT	ROADWAY FILL	0.01			0.02						

BUFFER DRAWING SHEET 1 OF 22

See Sheet 1B For Conventional Symbols

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

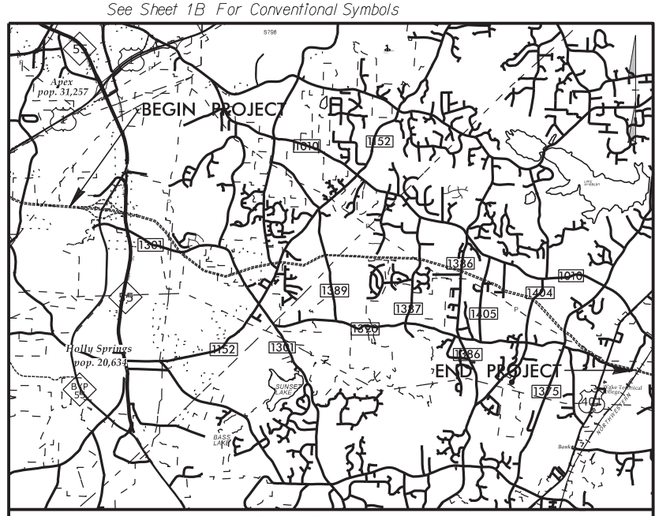
WAKE COUNTY

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

STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
6.401078	STP-540(19)	PE

TIP PROJECT: R-2721

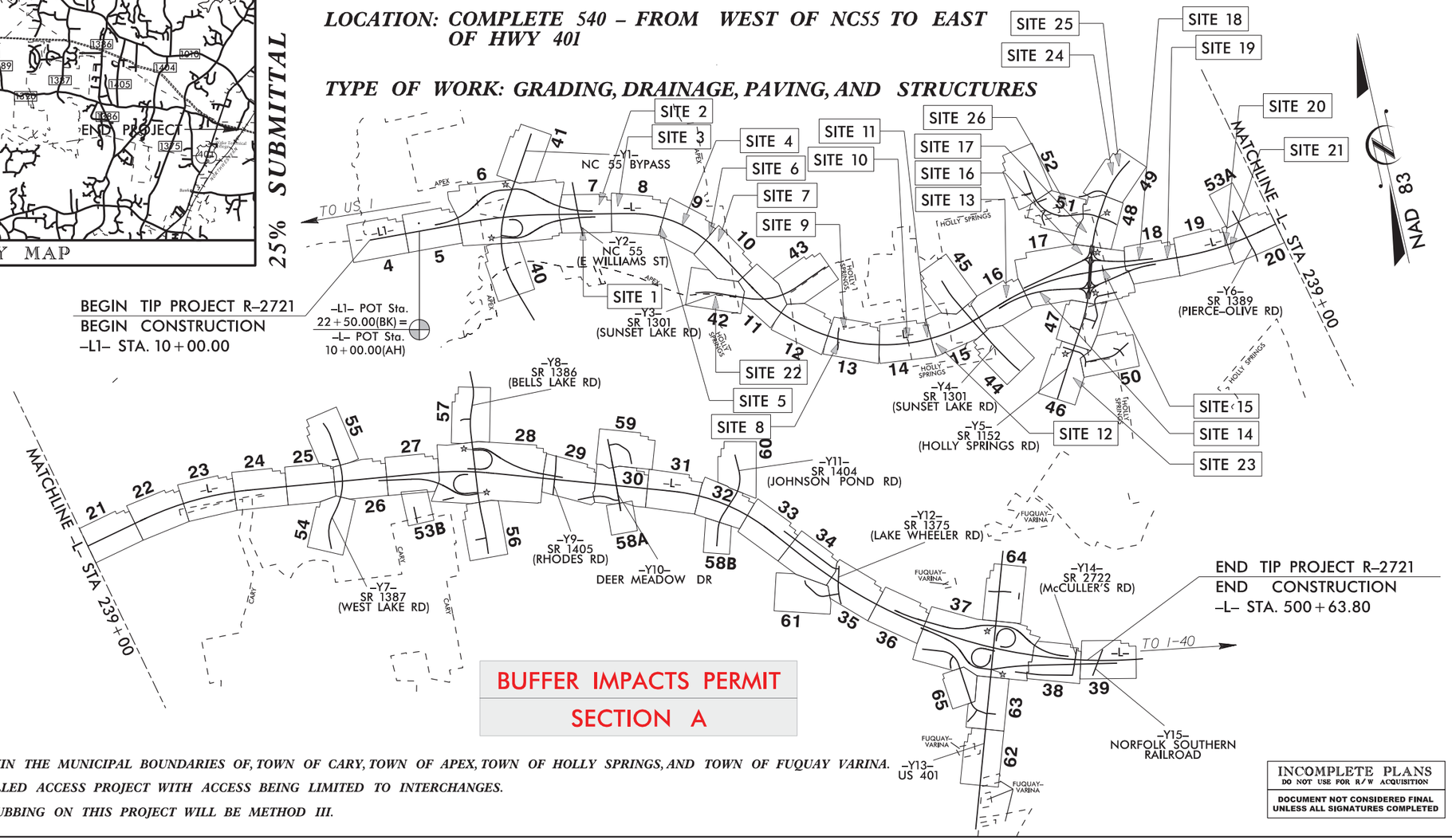
25% SUBMITTAL



VICINITY MAP

LOCATION: COMPLETE 540 – FROM WEST OF NC55 TO EAST OF HWY 401

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



BUFFER IMPACTS PERMIT

SECTION A

THIS PROJECT WITHIN THE MUNICIPAL BOUNDARIES OF, TOWN OF CARY, TOWN OF APEX, TOWN OF HOLLY SPRINGS, AND TOWN OF FUQUAY VARINA.

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

CLEARING AND GRUBBING ON THIS PROJECT WILL BE METHOD III.

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

CONTRACT:

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 2018 = 28,200
ADT 2040 = 66,400
K = 12 %
D = 65 %
T = 11 % *
V = 75 MPH
* TTST = 7% DUAL 4%

FUNC CLASS = INTERSTATE

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT R-2721	=9.529 Miles
LENGTH STRUCTURES	=0.178 Miles
TOTAL LENGTH TIP PROJECT R-2721	=9.351 Miles

Prepared In the Office of:

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
(919)571-7111
NC License Number F-0159

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

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
NC FIRM LICENSE NO. C-860

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
February 18, 2020

LETTING DATE:
February 18, 2020

Brian K. Eason, PE
PROJECT ENGINEER

Christina L. Yokeley, EI
PROJECT DESIGN ENGINEER

NCDOT CONTACT

HYDRAULICS ENGINEER

SIGNATURE: P.E.

ROADWAY DESIGN ENGINEER

SIGNATURE: P.E.

STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

09/08/99

7/9/2018
R2721_Hyd_prm_buf_psh_01.dgn
jharvey

BUFFER DRAWING SHEET 2 OF 22

51499

50′ 25′ 0 50′ 100′
SCALE: 1″=100′

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
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RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 NC FIRM LICENSE NO. C-890

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
ALLOWABLE IMPACTS ZONE 2

PAVEMENT REMOVAL
PAVED SHOULDER

NAD 83

END CONSTRUCTION
-Y2- STA. 19+75.00

-YIRPC- STA 17+00.00

MATCHLINE SHEET 6
-L- STA 45+00.00

-YIRPB- STA 14+00.00

MATCHLINE SHEET 8
-L- STA 58+00.00

NC TURNPIKE AUTHORITY
PAULINE PENNINGTON
MAINER T & UVA R. HOLLAND
MCI ENTERPRISES, LLC
WORD OF TRUTH CHURCH OF GOD
BESSIE H. JONES
HARVEY L. MONTAGUE
IGNACIO RODRIGUEZ IBARRA
LORENE DOBBS
PEGGY S. CANNADY
DARRIN F. MCCLAIN (PER GIS)
HEIR OF HENRY E. MCCLAIN
DAVID C. AND TERENA R. ROBINSON
EDWARD C. AND PATRICIA D. KILEY
DAVID A. AND REBECCA S. BETHAM
JAMES BASIL BANKS
QUANA LU

-Y2- POC Sta.16+50.78=
-YIRPC- POC Sta.13+75.76
Δ 107°05' 36.70"

-Y2- POT Sta.16+71.59
-YIRPC- SC Sta.12+05.00
-YIRPC-
-Y2- PC Sta.15+95.96
-L- POT Sta.49+75.34=
-Y2- POT Sta.15+56.34
Δ = 79°27' 37.04"
-Y2- POT Sta.14+68.28=
-YIRPB- POC Sta.14+10.51
Δ 96° 35' 10.57"
-YIRPB- CS Sta.18+28.32
-Y2- PT Sta.13+64.88
-YIRPB- SC Sta.12+00.00
-Y2- PC Sta.11+18.81
N 1° 24' 41.7" W

-L- POT Sta.53+33.40
-YIRPC- ST Sta.10+00.00
75.00' LT
-L- POT Sta.54+01.62
-YIRPB- ST Sta.10+00.00
75.00' RT

-L-
S 78° 10' 00.1" E

N 2° 09' 37.1" E
N 1° 17' 37.0" E

STREAM SF
WETLAND WG
SITE 1
SITE 2

15" RCP-III
15" RCP-IV
18" RCP-III
2GI
TB 2GI
FS
MCF
PDE
SINGLE FACE BARRIER
TOE PROTECTION SEE DETAIL 38A
LAT 3' BASE DITCH w/CL RIPRAP SEE DETAIL 29A
CL RIPRAP LENGTH=16 FT SEE DETAIL 1A
15" W/ 2 ELBOWS END FENCE +39.36 -YIRPC- 19.42' RT
BEGIN FENCE +73.33 -YIRPC- 19.42' RT
RETAIN
EXISTING R/W PER STATE PROJECT REF # R-2635A
ACCESS EASEMENT PER DB 488 PG 488

BEGIN CONSTRUCTION
-Y2- STA. 13+72.00

SEE SHEET 87 FOR -YIRPC- PROFILE
SEE SHEET 86 FOR -YIRPB- PROFILE
SEE SHEET 2B-25 FOR BRIDGE SKETCH
SEE SHEET 68 FOR -L- PROFILE

7/2/2018
R2721_Hyd_prm_buf_psh_07.dgn
lhoover

51499

BUFFER DRAWING SHEET 3 OF 22

50′ 25′ 0 50′ 100′

SCALE: 1″=100′

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
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RALEIGH, NORTH CAROLINA 27606
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PROJECT REFERENCE NO.	SHEET NO.
R-2721	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT REMOVAL
PAVED SHOULDER

NAD 83/95

MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2

STREAM SH
STREAM SJ
WETLAND WI

SITE 2
SITE 3
SITE 4
SITE 5

CL I RIPRAP LENGTH=10 FT SEE DETAIL 1A

LAT 6' BASE DITCH w/CL I RIPRAP SEE DETAIL 6A

CL I RIPRAP LENGTH=12 FT SEE DETAIL 1A

TOE PROTECTION SEE DETAIL 38A

-L- SC Sta. 65+39.56

-L- TS Sta. 60+00.00

MATCHLINE SHEET 7 -L- STA 58+00.00

MATCHLINE SHEET 9 -L- STA 71+00.00

REUNION CREEK PKWY

SUNSET HILLS SUBDIVISION

SUNSHINE CREST CT

SPRING DOVE LN

AT&T FIBER INSTALLED SINCE COMPLETION OF FIELD SURVEY

THOROUGHFARE BUFFER BM 2000 PG 1820

SEE SHEET 68 FOR -L- PROFILE

7/2018
R2721_Hyd_prm_buf_psh_08.dgn
lhaney

BUFFER DRAWING SHEET 4 OF 22

51499

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

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
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NC License Number F-0159

SUNGATE DESIGN GROUP, P.A.
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RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 NC FIRM LICENSE NO. C-890

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
ALLOWABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2
PAVEMENT REMOVAL
PAVED SHOULDER

18 HSA PROPERTIES, LLC

SITE 6
19 TRIANGLE GREENWAYS COUNCIL

SITE 4
STREAM SH
WETLAND WK
WETLAND WL
SITE 5
STREAM SJ

MATCHLINE SHEET 8 -L- STA 71+00.00
MATCHLINE SHEET 10 -L- STA 83+00.00

LAT 6' BASE DITCH wCL I RIPRAP SEE DETAIL 6A
TOE PROTECTION SEE DETAIL 38A
1@6'X8' RCBC
30" RCP-III
2GI-A
2GI
15" RCP-IV
30" W/ ELBOWS
JB wMH
LAT 6' BASE DITCH wCL II RIPRAP SEE DETAIL 6A
CL B RIPRAP OUTLET CHANNEL SEE DETAIL 47A
CL B RIPRAP
END FENCE
SINGLE FACE BARRIER
SANITARY SEWER EASEMENT
24" DIP
8" DIP
72" WD
JAMES AND DONNA MULLEN
MATTHEW J. KRISTIV AND MELISSA M. DIFONDI
DAVID L. AND ELIZABETH S. DOUGLAS
CLIFFORD J. BARTH
STEVEN DICKENS
JARED AND AMANDA MESTLER
NEAL GOODWIN
BRADLEY O. AND DIANA I. RINGLIEN
COREY A. NORTON
SUNSET HILLS HOMEOWNERS' ASSOC.
WILLIAM D. HAYES AND KIMBERLY A. BURRELL
THORNCREST DR
AT&T FIBER INSTALLED SINCE COMPLETION OF FIELD SURVEY
MIDDLE CREEK
NAD 83

SEE SHEET 69 FOR -L- PROFILE

7/9/2018
R2721_Hyd_prm_buf_psh_09.dgn
jhancock

BUFFER DRAWING SHEET 5 OF 22

51499

50′ 25′ 0 50′ 100′
SCALE: 1" = 100′

NAD 83

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
NC FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
R-2721	10
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

JACLYN AND JEREMY KRING

23 CURRIN BROS., INC

19 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. ARQUIETT

PRIVATE UTILITY EASEMENT

25 50' COLONIAL PIPELINE EASEMENT BB 1538 PG 161 APPROXIMATE LOCATION BB 1994 PG 161

24 NC DEPT. OF TRANSPORTATION

22 HSA PROPERTIES LLC

21 SUNSET HILLS HOMEOWNERS ASSOCIATION

SUNSET HILLS HOMEOWNERS ASSOCIATION

STREAM SM

-L- CS Sta. 83+79.88

-L- ST Sta. 89+04.88

SITE 6

SITE 7

WETLAND WR

STANDARD BASE DITCH SEE DETAIL 32A

TOE PROTECTION SEE DETAIL 38A

SPEC CUT V-DITCH SEE DETAIL 12A

BEGIN FENCE 734.35' 84-42 24.6'

TAIL DITCH w/CL II RIPRAP SEE DETAIL 37A

TOE PROTECTION SEE DETAIL 38A

-L- S 30° 52' 10.3" E

MATCHLINE SHEET 9 -L- STA 83+00.00

MATCHLINE SHEET 11 -L- STA 96+00.00

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

ALLOWABLE IMPACTS ZONE 1

ALLOWABLE IMPACTS ZONE 2

SEE SHEET 2B-26 FOR BRIDGE SKETCH

SEE SHEET 69 FOR -L- PROFILE

7/9/2018
R2721_Hyd_prm_buf_psh_10.dgn
jharvey

BUFFER DRAWING SHEET 6 OF 22

51499

50′ 25′ 0 50′ 100′
SCALE: 1″ = 100′

MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
ALLOWABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2

PAVEMENT REMOVAL
PAVED SHOULDER

NAD 83

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MATCHLINE SHEET 12 -L- STA 122+00.00

MATCHLINE SHEET 14 -L- STA 135+00.00

LAWRENCE AND JULIA BOURDEAU

PABLO AND SUSAN LIZARAZO

HOLLY SPRINGS RESIDENTIAL PROPERTIES LLC

20' TOWN OF HOLLY SPRINGS SANITARY SEWER EASEMENT BM 2012 PG 869

20' TOWN OF HOLLY SPRINGS SANITARY SEWER EASEMENT BM 2011 PG 72

25' COMMON OPEN SPACE BM 2008 PG 2093

50' I-540 BUFFER C-255 BM 2008 PG 1093

30' PUBLIC AT &/OR GREENWAY ENCROACHMENT BM 2011 PG 72

-Y3A- POT Sta. 15+56.64
-Y3A- PT Sta. 15+17.18
-Y3A- PRC Sta. 14+58.19
-Y3A- PC Sta. 13+95.82
-Y3A- PT Sta. 11+58.72
-Y3A- PRC Sta. 11+14.18
-Y3A- PC Sta. 10+30.42
-Y3A- POT Sta. 10+00.00

SITE 9
SITE 8

INLET CHANNEL SEE DETAIL 48A
TOE PROTECTION SEE DETAIL 38A
CL B RIPRAP
GRADE TO DRAIN (GTD)
OUTLET CHANNEL SEE DETAIL 48A
TOE PROTECTION SEE DETAIL 38A

6'x4' RCBC
15" RCP-IV
18" RCP-III
24" RCP-III
72" RCP
2GI
2GI-A
FS
DI

STREAM SS
STREAM SQ
WETLAND WX

38 NC DEPT OF TRANSPORTATION
39 NC DEPT OF TRANSPORTATION

M/I HOMES OF RALEIGH LLC
HOLLY SPRINGS RESIDENTIAL PROPERTIES LLC
TAYLOR MORRISON OF CAROLINAS INC
KEMING CAO
EDWIN WITTIG
DEREK MCCONNACHIE
DALE AND NANCY LEE
LUYE LIN
LEAH NORMANN
JOHN LANGAKER
BISHAN YE
ANNA FLORIAN
CORY ROYSTER
VICTOR AND KIMBERLEY POWLEY
JINGXU HE AND YAN YAN ZHANG
ALEX AMBROSE

CONC PATIOS AND 72" PVC FENCES
BLK WALL W/36" MTL RAIL
CONC RISER
GEO PLASTIC
MYSTIC PINE PL
MAYFIELD DR
EXISTING R/W

SEE SHEET 71 FOR -L- PROFILE

7/9/2018
R2721_Hyd_prm_buf_psh_13.dgn
lharvey

51499

BUFFER DRAWING SHEET 7 OF 22

50′ 25′ 0 50′ 100′

SCALE: 1″ = 100′

LOCHNER

H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612

NC License Number F-0159

SUNGATE DESIGN GROUP, P.A.
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RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 NC FIRM LICENSE NO. C-890

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT REMOVAL
PAVED SHOULDER

NAD 83

HOLLY SPRINGS RESIDENTIAL PROPERTIES LLC

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

WALLACE FARRINGTON

NEW DSW ROAD

8" DIP

8" PVC

40 NATALIE AND THOMAS BROOKS

43 BENJAMIN MCDONALD

STREAM SV

WETLAND WZ

SITE 11

INLET CHANNEL SEE DETAIL 50A

BEGIN FENCE 1+90.49 -L- 127.47' LT

END FENCE 65.46 -L- 127.39' LT

TOE PROTECTION SEE DETAIL 38A

39 NC DEPT OF TRANSPORTATION

INLET CHANNEL SEE DETAIL 49A

BEGIN FENCE 1+19.33 -L- 130.83' LT

END FENCE 91.65 -L- 130.94' LT

SITE 10

WILLIAM AND BERTHA TURNER

44

STREAM ST

1@6'X8' RCBC

WILLIAM GRIFFIN

45

MATCHLINE SHEET 13 -L- STA 122+00.00

MATCHLINE SHEET 15 -L- STA 148+00.00

140+00

145+00

2GI

FS

2GI-A

18" RCP-III

15" RCP-IV

30" RCP-III

15" RCP-III

24" RCP-III

SINGLE FACE BARRIER

46 JAMES TURNER AND WILLIAM TURNER

24" W 2 ELBOWS

30" W 2 ELBOWS

TOE PROTECTION SEE DETAIL 38A

LAT 3' BASE DITCH w/CL B RIPRAP SEE DETAIL 10A

OUTLET CHANNEL SEE DETAIL 49A

41 NC DEPT OF TRANSPORTATION

LAT 3' BASE DITCH w/CL B RIPRAP SEE DETAIL 5A

OUTLET CHANNEL SEE DETAIL 50A

47 H&B STEPHENSON FAMILY LLC

60' PRIVATE ROAD EASEMENT BM 1981 PG 1000

STREAM SW

SITE 12

BRIDGET GWALTNEY

TAYLOR MORRISON OF CAROLINAS, INC

DIANE COX

ALLISON AND STEVEN HARRIS

WOODCREEK NEIGHBORHOOD ASSN INC

HOLLY SPRINGS RESIDENTIAL PROPERTIES LLC

ERIN KAMM

MATTHEW AND HEATHER JONES

TIMOTHY REINHARDT AND APRIL SMITH

BASKETBALL

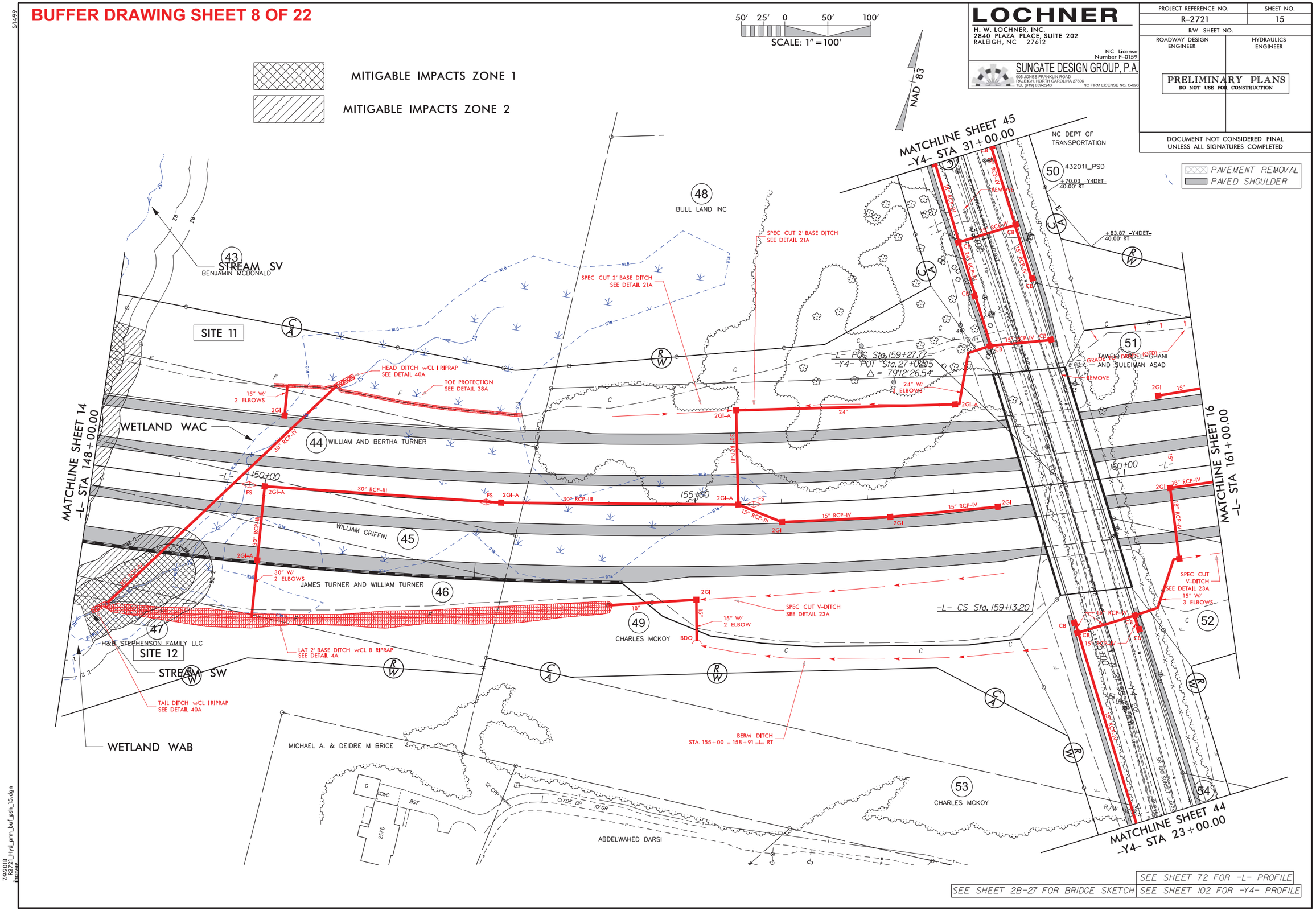
TENNIS COURTS

PLAY GROUND

SEE SHEET 71 FOR -L- PROFILE

7/9/2018
R2721_Hyd_prm_buf_psh_14.dgn
lbarzar

BUFFER DRAWING SHEET 8 OF 22



SEE SHEET 72 FOR -L- PROFILE

SEE SHEET 2B-27 FOR BRIDGE SKETCH | SEE SHEET 102 FOR -Y4- PROFILE

LOCHNER
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RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
NC FIRM LICENSE NO. C-890

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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7/9/2018
R2721_Hyd_prm_buf_psh_15.dgn
jbarvey

51499

BUFFER DRAWING SHEET 9 OF 22

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

MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2

PAVEMENT REMOVAL
PAVED SHOULDER

NAD 83

LOCHNER
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905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 NC FIRM LICENSE NO. C-890

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

50 NC DEPT OF TRANSPORTATION
51 TAWFIQ ABDEL-GHANI AND SULEIMAN ASAD
52 TAWFIQ ABDEL-GHANI AND SULEIMAN ASAD
55 CDP LEASING INC
56 WILL PIERSON & KAYLEE JAKUBOWSKI
57 SYLVIA SAMS

2SFD DARREN AND KIMBERLY ANDRUS
2SFD JENNIFER WARD AND JENNIFER REEVES

STREAM SX1
WETLAND WAE
SITE 13

-L- ST Sta. 162+33.20
-L- TS Sta. 166+45.42
-L- SC Sta. 170+45.42
-Y5RPC- SC Sta. 12+16.00
-L- POT Sta. 166+43.12= -Y5RPC- ST Sta. 10+00.00 71.00' RT

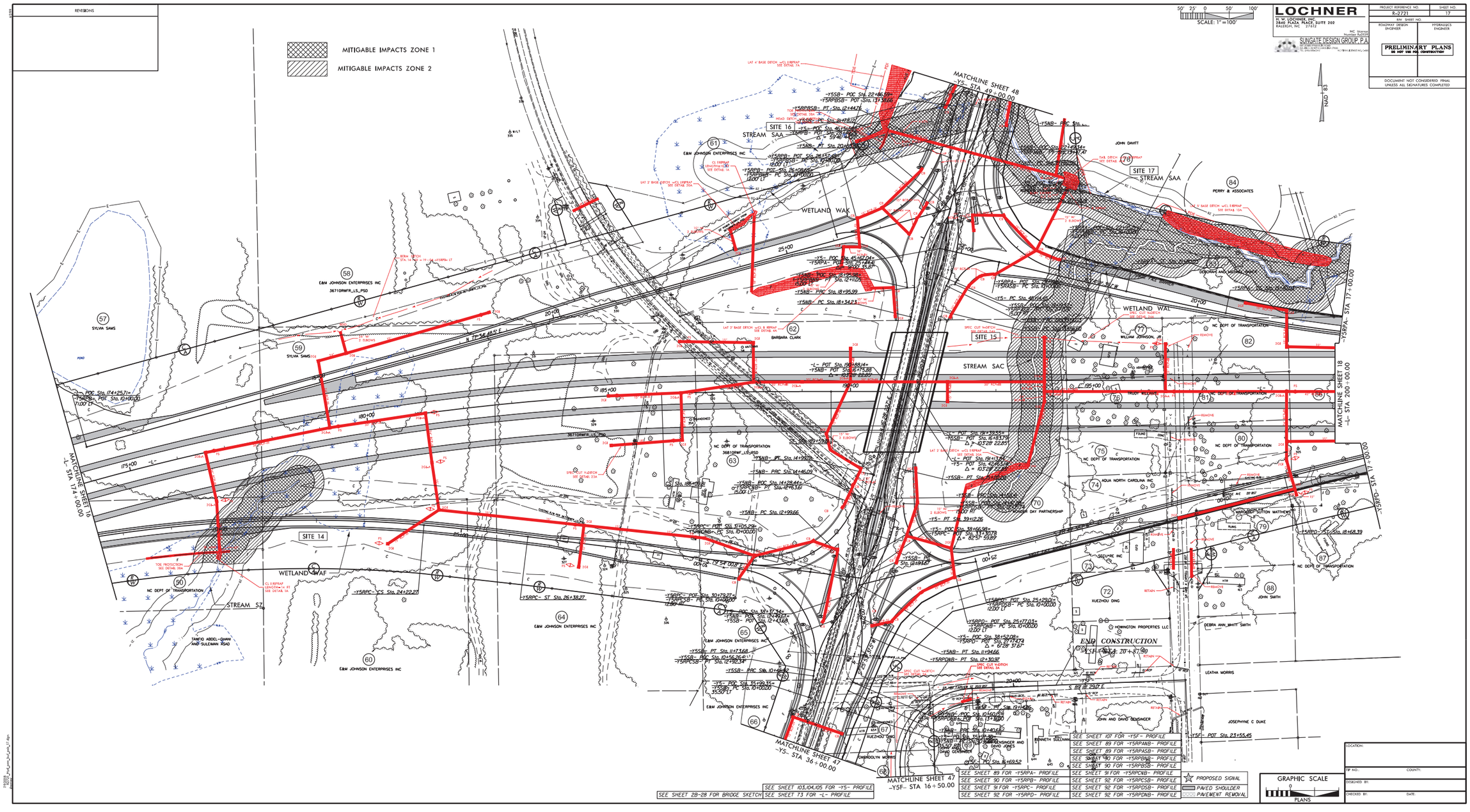
INLET CHANNEL SEE DETAIL 52A
TOE PROTECTION SEE DETAIL 38A
CL B RIPRAP
15" W/ ELBOWS
DAYLIGHT DITCH
LAT 2' BASE DITCH w/CL B RIPRAP SEE DETAIL 10A
2-8'x 4' RCBC
SINGLE FACE BARRIER
GRADE TO DRAIN (GTD)
SPEC CUT V-DITCH SEE DETAIL 23A
OUTLET CHANNEL SEE DETAIL 52A
CL I RIPRAP
36" W/ 2 ELBOWS
JB V-MH
END FENCE +04.71 -L- 160.33' RT
BEGIN FENCE -L- 164+98.49 160.93' RT
TOE
POND
RUINS
RIPRAP

15" RCP-IV
18" RCP-III
18" RCP-IV
24" RCP-III
30" RCP-III
36" RCP-IV
2GI
2GI-A
FS

MATCHLINE SHEET 15 -L- STA 161+00.00
MATCHLINE SHEET 17 -L- STA 174+00.00
MATCHLINE SHEET 44

7/9/2018
R-2721_Hyd_prm_buf_psh_16.dgn
lhorney

BUFFER DRAWING SHEET 10 OF 22



BUFFER DRAWING SHEET 11 OF 22

51499

SCALE: 1" = 100'

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RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
NC FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
R-2721	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT REMOVAL
PAVED SHOULDER

SITE 17
SITE 18
SITE 19

AQUA NORTH CAROLINA, INC.
88 SEAN AND ANNA STARR
20' DRAINAGE EASEMENT SCALED FROM BM 1985 PG 422
85 THOMAS AND DEBORAH ATKINSON
89 FRANS OUDSHOORN
90 KAREN JETTON
91 THOMAS ANS SUSAN SLUCHAK
92 QUAD TRI LLC OLIVE, MARTHA
86 NC DEPT OF TRANSPORTATION
87 NC DEPT OF TRANSPORTATION
93 GEORGE I BOGER

INLET CHANNEL SEE DETAIL 53A
-Y5RPA- TS Sta. 14+30.72
STREAM SAA
-Y5RPA- SC Sta. 16+40.22
LAT 2' BASE DITCH w/CL I RIPRAP SEE DETAIL 4A
-L- POT Sta. 207+09.24= -Y5RPA- SPOT Sta. 10+00.00 71.00' LT
-L- POT Sta. 207+54.92= -Y5RPD- ST Sta. 10+00.00 71.00' RT
WETLAND WAO(2)
TS Sta. 212+05.98
CL I RIPRAP LENGTH=14 FT SEE DETAIL 1A
TOE PROTECTION SEE DETAIL 38A
DAYLIGHT DITCH
BURY INVERT 0.3 FT
15" W/ 2 ELBOWS
18" W/ 2 ELBOWS
3@9'x 8' RCBC
-Y5RPD- CS Sta. 16+18.39
-Y5RPD- SC Sta. 12+50.00
BEGIN DITCH 1 FOOT ABOVE NG
OUTLET CHANNEL SEE DETAIL 53A
WETLAND WAO(1)
STREAM SAE
LAT 2' BASE DITCH w/CL I RIPRAP SEE DETAIL 20A
CL I RIPRAP LENGTH=14 FT SEE DETAIL 1A
N 83° 00' 23.2" W
S 18° 00' 00.1" E
MATCHLINE SHEET 17 -L- STA 200+00.00
MATCHLINE SHEET 17 -Y5RPD- STA 17+00.00
MATCHLINE SHEET 19 -L- STA 213+00.00

MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2

SEE SHEET 89 FOR -Y5RPA- PROFILE
SEE SHEET 92 FOR -Y5RPD- PROFILE
SEE SHEET 73 FOR -L- PROFILE

7/2/2018
R-2721_Hyd_prm_buf_psh_18.dgn
lhorney

BUFFER DRAWING SHEET 12 OF 22

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

NAD 83

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
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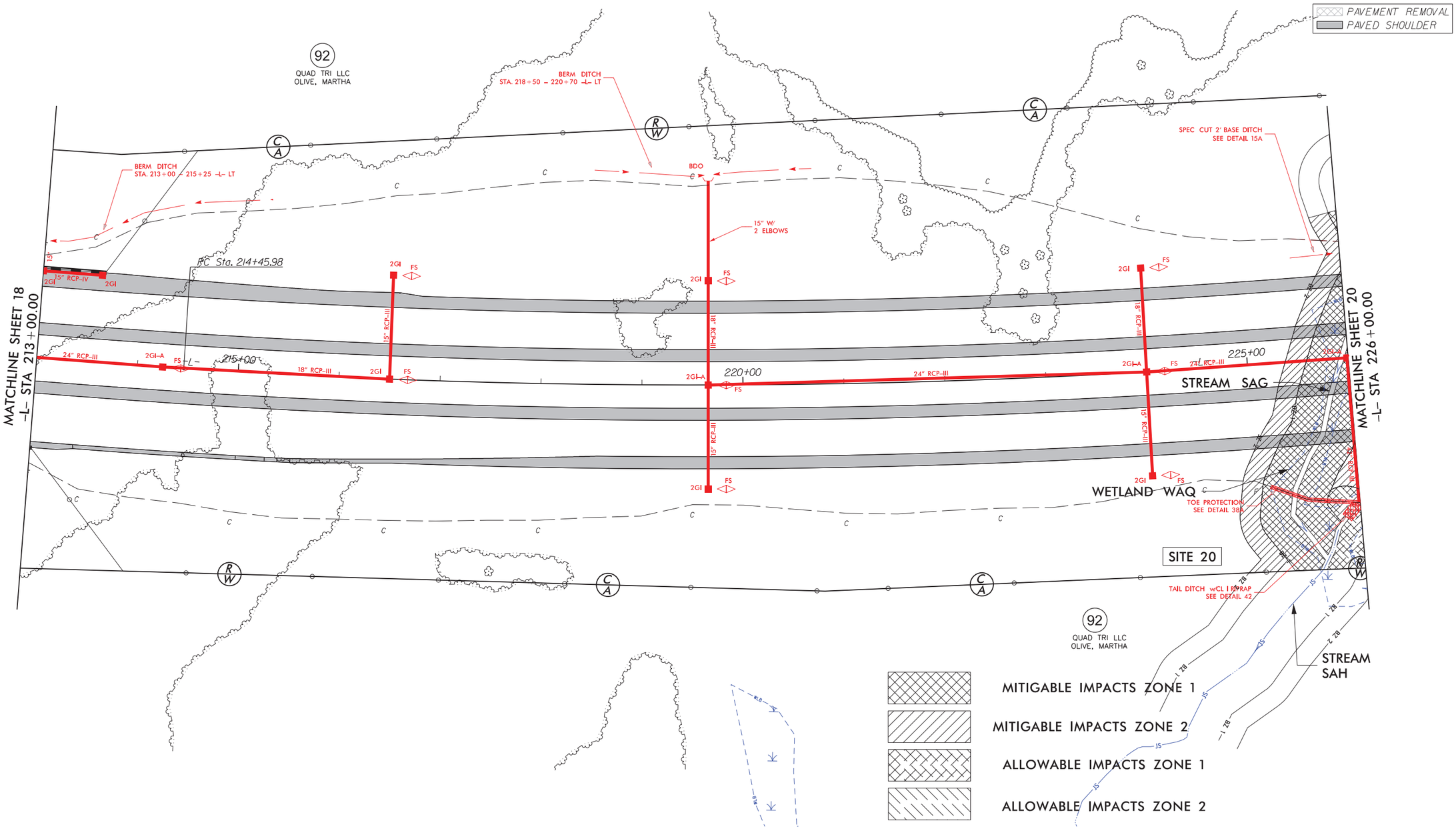
SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 NC FIRM LICENSE NO. C-890

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

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



SEE SHEET 73 FOR -L- PROFILE

51499

7/9/2018
R2721_Hyd_prm_buf_psh_19.dgn
jbarvey

BUFFER DRAWING SHEET 13 OF 22

51499

50′ 25′ 0 50′ 100′
SCALE: 1″=100′

LOCHNER
H. W. LOCHNER, INC.
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NC License Number F-0159

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
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PROJECT REFERENCE NO.	SHEET NO.
R-2721	20
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
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PAVEMENT REMOVAL
PAVED SHOULDER

NAD 83

MATCHLINE SHEET 53
-Y6- STA 21+00.00

MATCHLINE SHEET 19
-L- STA 226+00.00

MATCHLINE SHEET 21
-L- STA 239+00.00

92 QUAD TRI LLC
OLIVE, MARTHA

92 QUAD TRI LLC

STREAM SAG

SITE 20

SITE 21

HEAD DITCH w/CL I RIPRAP SEE DETAIL 40A

TOE PROTECTION SEE DETAIL 38A

FALSE CUT SEE DETAIL 27A

HEAD DITCH w/CL I RIPRAP SEE DETAIL 44A

TOE PROTECTION SEE DETAIL 38A

FALSE CUT SEE DETAIL 27A

SPEC CUT V-DITCH SEE DETAIL 19A

SPEC CUT 2' BASE DITCH SEE DETAIL 15A

SPEC LAT V-DITCH SEE DETAIL 14A

CL B RIPRAP

WETLAND WAQ

-L- POC Sta. 231+09.54
-Y6- POT Sta. 16+65.83
Δ = 84°46'56.15"

-L- CS Sta. 233+93.56

-L- ST Sta. 236+03.56

-Y6- PT Sta. 14+76.32

-Y6- PRC Sta. 12+82.77

-L- N 77° 00' 00.1" E

BEGIN CONSTRUCTION
-Y6- STA. 12+00.00

BERM DITCH STA. 229+54 – 230+50 -L- RT

TOE PROTECTION SEE DETAIL 38A

BDO

REMOVE

CEMETERY

50' POWER LINE EASEMENT BM 1979 PG 361

50' R/W CP&L TRANSMISSION LINE 100kV BM 1979 PG 361

SR 1359 PIERCE RD 20' EST

EXISTING R/W

MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
ALLOWABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2

SEE SHEET 109 FOR -Y6- PROFILE
SEE SHEET 2B-28 FOR BRIDGE SKETCH
SEE SHEET 75 FOR -L- PROFILE

7/6/2018
R-2721
thayes
I:\R-2721_Hyd_prm_buf_pph_20.dgn

BUFFER DRAWING SHEET 14 OF 22

51499

50′ 25′ 0 50′ 100′
SCALE: 1″=100′

NAD 83

LOCHNER
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RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 NC FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
R-2721	42
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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PAVEMENT REMOVAL
PAVED SHOULDER

21 SUNSET HILLS HOMEOWNERS ASSOCIATION

22 HSA PROPERTIES LLC

218 D.R. HORTON, INC

PRIVATE OPEN SPACE

217 TOWN OF APEX PUMP STATION EASEMENT

219 ARBOR CREEK KS, LLC

220 TOWN OF HOLLY SPRINGS

24 NC DEPT. OF TRANSPORTATION

26 THE MATA FAMILY, LLC

221 BNRICH, INC

KELLY M. MCGEE

CATHERINE E. CARVER

MINNIE J. AND WILLIE C. BRIDGES

JOSH D. PALADENI

CHAD D. WOODARD

CHARLIE K. CHAN AND IRIS Y. CHU

ROSE PROPERTY ONE, LLC

FRANK TOMS III AND LAURA DAVES TOMS

JOHN LUCIDO

RAQUEL BROOKS

SEN LOUIE AND LILY CHOW

AMANDA MARIE KRIARIS

ZACHARY DARGATZ AND KRISTEN KNIGHT

TUSHAR AND LEENA BAJAJ

ROBERT AND COLLEEN BALES

ZACHARY LEWIS HALL DARIN S. LEIGH

EARNEST B. III AND JENNIFER N. GOODRICH

SREENIVAS VEMULAPALLI AND SRIVALLI DONTHINENI

CHANDRA YELLAPANTULA AND HARINATH APPANI

CURRIN BROS., INC

STREAM SO

WETLAND WS

SITE 22

BEGIN CONSTRUCTION
-Y3- STA. 10+00.00

-Y3- PT Sta. 14+65.18

-Y3- POT Sta. 10+00.00

-Y3- Sta. 20+05.62

-Y3- Sta. 20+00

S 83° 58' 49" E

S 68° 08' 00.2" E

MATCHLINE SHEET 11
-Y3- STA 22+00.00

MATCHLINE SHEET 11

POE

TOE PROTECTION SEE DETAIL 38A

INLET CHANNEL SEE DETAIL 54A

OUTLET CHANNEL SEE DETAIL 54A

LAT 2' BASE DITCH w/CL I RIPRAP SEE DETAIL 20A

CL B RIPRAP

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

SEE SHEET 2B-27 FOR BRIDGE SKETCH | SEE SHEET 101 FOR -Y3- PROFILE

7/9/2018
R2721_Hyd_prm_buf_psh_42.dgn
lhoover

BUFFER DRAWING SHEET 15 OF 22

51499

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

LOCHNER
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RALEIGH, NORTH CAROLINA 27606
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PROJECT REFERENCE NO.	SHEET NO.
R-2721	46
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

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NAD 83

PAVEMENT REMOVAL
PAVED SHOULDER
PROPOSED SIGNAL

BEGIN CONSTRUCTION
-Y5D- STA. 10+00.00
-Y5D- POT Sta. 10+00.00

BEGIN CONSTRUCTION
-Y5- STA. 11+58.52

-Y5- PT Sta. 19+04.92
-Y5- PC Sta. 17+93.07
-Y5- PC Sta. 11+45.25
-Y5D- POT Sta. 12+65.36
-Y5I- POT Sta. 10+00.00
Δ = 89°37'43.7"

WETLAND WAG

AMERICAN PROPERTIES HOLDINGS LLC
PARMINDER AND PARDEEP SANDHAR
CVS 5886 NC LLC
SIV-J LLC
TOWN OF HOLLY SPRINGS SANITARY SEWER EASEMENT BM 2004 PG 446
PERMANENT DRAINAGE EASEMENT BM 2004 PG 446
20' TOWN OF HOLLY SPRINGS SANITARY SEWER EASEMENT DB 8688 PG 116
UNKNOWN
PAULINE FRAZIER
LOCKHOLLY LLC
BETTY AND EARLIE MOORE
DONALD AND MARGARET MCNEILL
J&D PEACOCK PROPERTIES LLC
CREEK CLUB, LTD
ROSEN HOLLY SPRINGS II LLC
ROSEN HOLLY SPRINGS LLC
JORDAN REAL ESTATE HOLDINGS LLC
TA PROPERTIES LLC
WADE & ORA BURT
WILLIAM & WADE BURT
VARIABLE WIDTH TOWN OF HOLLY SPRINGS UTILITY EASEMENT BM 2005 PG 1874
VARIABLE WIDTH TOWN OF HOLLY SPRINGS SANITARY SEWER EASEMENT DB 8688 PG 116 BM 2005 PG 1874

STREAM SX

SITE 23

MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2

MATCHLINE SHEET 47
-Y5- STA 24+00.00

MATCHLINE SHEET 50
-Y5I- STA 13+00.00

SEE SHEET 103 FOR -Y5- PROFILE
SEE SHEET 106 FOR -Y5D- PROFILE
SEE SHEET 108 FOR -Y5I- PROFILE

7/9/2018
R2721_Hyd_prm_buf_psh_46.dgn
lhoward

BUFFER DRAWING SHEET 16 OF 22

51499

50′ 25′ 0 50′ 100′
SCALE: 1″=100′

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
RALEIGH, NC 27612
NC License Number F-0159

SUNGATE DESIGN GROUP, P.A.
905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
NC FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
R-2721	48
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83

PAVEMENT REMOVAL
PAVED SHOULDER
PROPOSED SIGNAL

MATCHLINE SHEET 51
-Y5A- STA 14+00.00

MATCHLINE SHEET 17
-Y5- STA 49+00.00

MATCHLINE SHEET 49
-Y5- STA 62+00.00

SITE 17

-Y5B- POC Sta. 49+50.25=
-Y5SB- PT Sta. 23+80.55
35.50' LT

-Y5- PCC Sta. 50+36.92

-Y5- POC Sta. 56+56.61=
-Y5A1- POT Sta. 10+00.00
-Y5B- POT Sta. 10+00.00
Δ = 90°45'17.65"

-Y5- PC Sta. 11+08.85

-Y5- PT Sta. 57+23.62

-Y5- PC Sta. 60+93.81

-Y5B- PT Sta. 14+61.01
S 44°15'54.9" E
-Y5B- POT Sta. 14+86.41

END CONSTRUCTION
-Y5B- STA. 14+37.50

TAIL DITCH w/CL I RIPRAP SEE DETAIL 9
LAT 4' BASE DITCH w/CL I RIPRAP SEE DETAIL 7A
LAT 2' BASE DITCH w/CL B RIPRAP SEE DETAIL 4A
LAT 2' BASE DITCH w/CL I RIPRAP SEE DETAIL 20A
BACKFILL TO NG EL. 404

STREAM SAB
WETLAND WAJ

MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2

284 WILLIE WATSON
420 GARRY RICHTER
414 JOSEPH AND NANCY MACK
283 CHARLES AND KOREA DUNCAN
285 JOHN MITCHELL
81 B&M JOHNSON ENTERPRISES INC
282 DONALD ANDREWS
71
287 ROLAND AND ANITA TAYLOR
288 MICHAEL FINNERTY
289 JEFFERY AND GAIL SANDERS
286 KEITH AND CONNIE HARSHMAN
JOHN DAVITT
290 MICHAEL AND LAURIE PARKER
291 JAMES HAMPTON, JR.
292 AMY AND DAVID PATTERSON
ERIC PETTY
STEVEN AND MICHELLE LESLIE
MANUEL AND LISA SUAREZ
JOSEPH CICHOCKI

SR 1150 HOLLY SPRINGS RD 23' BST
SR 3922 ASHWILL CT 17' BST

SEE SHEET Y5 FOR -104- PROFILE
SEE SHEET Y5A FOR -105- PROFILE
SEE SHEET Y5B FOR -1056- PROFILE

7/9/2018
R2721_Hyd_prm_buf_psh_48.dgn
jhopkins

BUFFER DRAWING SHEET 17 OF 22

51499

50′ 25′ 0 50′ 100′
SCALE: 1″=100′

NAD 83

LOCHNER
H. W. LOCHNER, INC.
2840 PLAZA PLACE, SUITE 202
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RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243 NC FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
R-2721	49
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT REMOVAL
PAVED SHOULDER

-Y5G- PT Sta. 12+43.82
BEGIN CONSTRUCTION
-Y5G- STA. 12+87.50
-Y5G- PC Sta. 13+47.56
-Y5G- PT Sta. 16+46.29
-Y5- PT Sta. 16+46.29
-Y5- STA 62+00.00
MATCHLINE SHEET 48
-Y5- POC Sta. 62+65.48=
-Y5G- POT Sta. 17+34.87
Δ = 87°04'30"
-Y5- PT Sta. 70+54.06
-Y5- POT Sta. 72+73.53
70+00
END CONSTRUCTION
-Y5- STA. 72+50.00

BRIAN AND ANNAMARY CHURCH
BRYANT AND VICTORIA PERDUN
GEORGE AND CYNTHIA HARDIN
SECU*RE INC
JOSEPH AND NANCY MACK
JOHN MITCHELL
KATHERINE KALEY
ALAN AND JENNIFER CLEGG
AQUA NORTH CAROLINA
WELL LOT #2
WILLIAM AND BETSY HINE
GARY AND JEAN WINGLER
RUSSELL MILLER AND KIMBERLY KORB
HALLMARK INVESTORS
CHARLES AND LINDA PULLIAM
SILAS AND EVON WARD
JAMES HAMPTON, JR.
ST MARYS BAPTIST CHURCH

SITE 24
SITE 25

STREAM SEE

20' DRAINAGE EASEMENT BM 1985 PG 1289
20' ACCESS EASEMENT BM 1985 PG 1794
APPROXIMATE LOCATION OF 30' DRAINAGE EASEMENT SCALED FROM BM 1986 PG 1040

RETAIN
REMOVE
SPEC CUT V-DITCH SEE DETAIL 23A
DITCH BLOCK
CL B RIPRAP
INLET CHANNEL SEE DETAIL 56A
LAT 2' BASE DITCH w/CL B RIPRAP SEE DETAIL 4A
LAT V-DITCH w/CL B RIPRAP SEE DETAIL 22A
SPEC CUT V-DITCH SEE DETAIL 3A
OUTLET CHANNEL SEE DETAIL 56A
2@7'x3' RCBC
65.000
SR 1152 HOLLY SPRINGS RD 22' BST
N 55°02'17" E
N 75°40'50" E
PUE
RW
E
C
F
FO
GR
RIP RAP
BLK WALL
POOL
CONC

MITIGABLE IMPACTS ZONE 1
MITIGABLE IMPACTS ZONE 2
ALLOWABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2

SEE SHEET 105 FOR -Y5- PROFILE
SEE SHEET 107 FOR -Y5G- PROFILE

7/9/2018
R2721_Hyd_prm_buf_psh_49.dgn
lhotzer

BUFFER DRAWING SHEET 18 OF 22

51499

MITIGABLE IMPACTS ZONE 1

MITIGABLE IMPACTS ZONE 2

SCALE: 1" = 100'

50' 25' 0 50' 100'

NAD 83

LOCHNER
H. W. LOCHNER, INC.
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NC License Number F-0159

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905 JONES FRANKLIN ROAD
RALEIGH, NORTH CAROLINA 27606
TEL (919) 859-2243
NC FIRM LICENSE NO. C-890

PROJECT REFERENCE NO.	SHEET NO.
R-2721	51
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PRELIMINARY PLANS
DO NOT USE FOR CONSTRUCTION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PAVEMENT REMOVAL
PAVED SHOULDER

61 E&M JOHNSON ENTERPRISES INC

306 ALICE WATSON

MEI QIN JIANG AND XING XIAN WANG

JAWED AND MUMTAZ KHAN

SITE 17

SITE 26

STREAM SAB

WETLAND WAI

284 WILLIE WATSON

308 THAMOTHARAMPILLAI SIVARAJ

309 IAN EAGER

310 NANCY WILSON

307

311

MICHALE AND JANICE SPEARS

CHARLES AND ASHLEY BETTINI

ERIC RAGONE AND RENE LATELLA

DALLAS PERRY

DAVID AND DONNA MCCALLUM

ERNEST AND REBECCA KIRSTEIN

SCOTT AND ANGELA SOUTHERLAND

N 84° 37' 06.3" W

N 8° 45' 36.0" E

N 46° 54' 39.9" E

MATCHLINE SHEET 48 -Y5A- STA 14+00.00

MATCHLINE SHEET 52 -Y5A- STA 27+00.00

20+00

18" W/ 2 ELBOWS

INJ. DITCH w/CL I RIPRAP SEE DETAIL 43A

CL B RIPRAP

LAT 2' BASE DITCH w/CL B RIPRAP SEE DETAIL 4A

SPEC CUT V-DITCH SEE DETAIL 3A

SPEC LAT V-DITCH SEE DETAIL 3A

GRADE TO DRAIN (GTD)

RETAIN

RETAIN

RETAIN

RETAIN

RETAIN

GTD

GTD

GTD

GTD

SEE SHEETS 105 & 106 FOR -Y5A- PROFILE

SEE SHEET 107 FOR -Y5H- PROFILE

SEE SHEET 108 FOR -Y5K- PROFILE

7/9/2018
8:27:27 AM
jhoover

R:\2721_Hyd_prm_buf_psh_51.dgn

RIPARIAN BUFFER IMPACTS SUMMARY

Site No.	Station (From/To)	Structure Size / Type	IMPACTS									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE				
			ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)
1	11+11 to 11+73-Y1RPB-LT	48" RCP			X		1100	1100					
2	52+99 to 58+32 -L-LT	ROADWAY FILL			X				29408	18956	48364		
3	59+05 to 60+25-L-	30" RCP	X						24273	16141	40414		
4	65+01 to 82+52-L-	ROADWAY FILL	X						132681	69262	201943		
5	69+55 to 71+59 -L-	30" RCP	X						10459	8389	18848		
6	81+56 to 87+64-L-	BRIDGE		X		26603	14543	41146	617	3309	3926		
7	84+60 to 85+96 -L-LT	ROADWAY FILL			X	2809	748	3557	9867	4783	14650		
8	124+80 to 125+32 -L-	ROADWAY FILL	X			1831	3121	4952					
9	124+47 to 126+48 -L-	1@6'x8' RCBC	X						18345	12510	30855		
10	140+32 to 142+97-L-	1@6'x8' RCBC	X						28484	18802	47286		
11	146+80 to 148+37-L-	1@6'x8' RCBC	X						32299	46835	79134		
12	147+44 to 149+51-L-RT	30" RCP			X				8561	6046	14607		
13	168+13 to 169+95-L-	2@9'x8' RCBC	X						27842	18095	45937		
14	19+36 to 22+13-Y5RPC-	ROADWAY FILL	X						17040	12724	29764		
15	192+63 to 197+32-L-	ROADWAY FILL	X						48780	31001	79781		
16	46+92 to 49+14 -Y5-LT	ROADWAY FILL			X				15703	9430	25133		
17	15+80-Y5A- to 202+41-L-	ROADWAY FILL	X						118705	67195	185900		
18	201+74 to 206+80-L-	3@9'x8' RCBC	X						63401	35703	99104		
19	209+01 to 211.28 -L-	42" RCP			X				16825	12033	28858		
20	224+83 to 226+97-L-	ROADWAY FILL	X						22669	14026	36695		
21	225+70 to 226+35-L-LT	ROADWAY FILL			X	2521	784	3305					
22	14+60 to 16+35 -Y3-	4@12'x8' RCBC	X						18564	10568	29132		
23	15+10 to 16+77-Y5-	2@9'x8' RCBC	X						19377	8151	27528		
TOTALS*:						**33764**	**20296**	**54060**	**663900**	**423959**	**1087859**	**0**	**0**

NOTES:

Revised 2018 Feb

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
7/9/2018
WAKE COUNTY
R-2721
6.401078
SHEET 19 OF 22

RIPARIAN BUFFER IMPACTS SUMMARY

Site No.	Station (From/To)	Structure Size / Type	IMPACTS									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE				
			ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)
24	66+72 to 69+30 -Y5-	2@7'x8' RCBC	X						9758	5594	15352		
25	69+01 to 69+70-Y5-LT	ROADWAY FILL			X	5086	2081	7167					
26	16+25 to 16+89-Y5A-RT	DRAINAGE PIPE			X				1112	889	2001		
		TOTALS FROM THIS SHEET				5086	2081	7167	10870	6483	17353	0	0
		TOTALS FROM SHEET 19				33764	20296	54060	663900	423959	1087859	0	0
TOTALS*:						**38850**	**22377**	**61227**	**674770**	**430442**	**1105212**	**0**	**0**

NOTES:

Revised 2018 Feb

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
7/9/2018
WAKE COUNTY
R-2721
6.401078
SHEET 20 OF 22

WETLANDS IN BUFFER IMPACTS SUMMARY

SITE NO.	STATION (FROM/TO)		WETLANDS IN BUFFERS ZONE 1 (ft^2)	WETLANDS IN BUFFERS ZONE 2 (ft^2)
1	11+00 to 13+44-Y1RPB-LT		0	1100
2	52+99 to 58+32 -L-LT		21740	8886
4	65+01 to 82+52-L-		4296	8310
6	81+56 to 87+64-L-		305	5848
7	84+60 to 85+96 -L-LT		1578	2822
8	124+80 to 125+32 -L-		2767	537
9	124+47 to 126+48 -L-		15816	5499
10	140+32 to 142+97-L-		2466	1755
11	146+80 to 148+37-L-		4788	1931
12	147+44 to 149+51-L-RT		1455	1459
13	168+13 to 169+95-L-		1926	3348
14	19+36 to 22+13-Y5RPC-		11351	6545
15	192+63 to 197+32-L-		6735	1270
16	46+92 to 49+14 -Y5-LT		11955	3997
17	15+80-Y5A- to 202+41-L-		3387	2052
18	201+74 to 206+80-L-		3972	6105
19	209+01 to 211.28 -L-		8324	736
20	224+83 to 226+97-L-		10895	109
TOTAL:			**113756**	**62309**

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
7/9/2018
WAKE COUNTY
R-2721
6.401078
SHEET 21 OF 22

Revised 2018 Feb

WETLANDS IN BUFFER IMPACTS SUMMARY

SITE NO.	STATION (FROM/TO)		WETLANDS IN BUFFERS ZONE 1 (ft^2)	WETLANDS IN BUFFERS ZONE 2 (ft^2)
21	225+70 to 226+35-L-LT		1748	367
22	14+60 to 16+35 -Y3-		210	2581
23	15+10 to 16+77-Y5-		476	594
	TOTAL FROM THIS SHEET		**2434**	**3542**
	TOTAL FROM SHEET 21		**113756**	**62309**
TOTAL:			**116190**	**65851**

Revised 2018 Feb

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
7/9/2018
WAKE COUNTY
R-2721
6.401078
SHEET 22 OF 22

Rev. Jan 2009