



North Carolina Department of Transportation

Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

WBS Element: 34839.1.8 TIP No.: U-2579AB County(ies): Forsyth Page 1 of 10

General Project Information

WBS Element:	34839.1.8	TIP Number:	U-2579AB	Project Type:	New Location	Date:	11/19/2018
NCDOT Contact:	Craig J Lee, PE			Contractor / Designer:	Wyatt D. Yelverton, PE		
Address:	1020 Birch Ridge Dr. Raleigh, NC 27610			Address:	555 Fayetteville St., Suite 900 Raleigh, NC 27601		
	Phone: 919-707-6708				Phone: 919-232-6623		
	Email: cjlee@ncdot.gov				Email: wyatt.yelverton@hdrinc.com		
City/Town:	Winston-Salem			County(ies):	Forsyth		
River Basin(s):	Yadkin-Pee Dee			CAMA County?	No		
Wetlands within Project Limits?	Yes						

Project Description

Project Length (lin. miles or feet):	2.73 Miles	Surrounding Land Use:	Residential (Single Family)
Proposed Project		Existing Site	
Project Built-Upon Area (ac.)	530.0 ac.		90.0 ac.
Typical Cross Section Description:	6 lane divided freeway w/ an 18 foot grass median: (2) 12 foot outside paved shoulders, (3) 12 foot travel lanes, (2) 12 foot paved median shoulders - Total width of 146'		
Annual Avg Daily Traffic (veh/hr/day):	Design/Future: 20,200	Year: 2040	Existing: 14,700 Year: 2018

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

Project Description: The proposed project (U-2579AB) is part of the future I-74 Winston-Salem Northern Beltway from I-40 Bus/US 421 to I-40 and tying with the U-2579AA portion. The project will construct approximately 3 miles of 6-lane divided highway in new location. The project also includes widening of I-40 and 2 major interchanges: Kernersville Rd. and 3-level interchange at I-40. There are 2 proposed single barrel culvert crossings on the project at tributaries to Fiddlers Creek. There are no bridge crossings over major water bodies on the project. Pipe culverts will be used to convey all other jurisdictional stream crossings through the project. Wetlands are also located throughout the length of the entire project.

Impact Minimization Efforts: Guardrail with 2:1 slopes were utilized throughout the project to minimize surface water impacts to streams and wetlands. Ditches and pipes that outlet adjacent to wetlands have been designed to have non-erosive velocities to help protect the existing wetlands.

Stormwater BMP Measures: Stormwater control measures such as dry detention and energy dissipator basins were proposed at specific locations along the project. Many ditches are designed to achieve grass swale credit.

Waterbody Information

Surface Water Body (1):	Fiddlers Creek	NCDWR Stream Index No.:	12-94-13-3		
NCDWR Surface Water Classification for Water Body	Primary Classification:	Class C			
	Supplemental Classification:	None			
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	ESE-S8, ESE-S61, ESE-S11, ESE-S59, ESE-S12, ESE-S13, ESE-S14, ESE-S15, ESE-S16, ESE-S49, ESE-S51, ESE-S52, ESE-S56, ESE-S58, ESE-S25, ESE-S72, ESE-S50, ESE-S26		Buffer Rules in Effect:	N/A	
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)					



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Additional Waterbody Information

Surface Water Body (2):	Fishers Branch	NCDWR Stream Index No.:	12-94-12-2-(1)
NCDWR Surface Water Classification for Water Body	Primary Classification:	Water Supply III (WS-III)	
	Supplemental Classification:	None	
Other Stream Classification:	None		
Impairments:	None		
Aquatic T&E Species?	No	Comments:	
NRTR Stream ID:	ESE-S63, ESE-S69	Buffer Rules in Effect:	N/A
Project Includes Bridge Spanning Water Body?	No	Deck Drains Discharge Over Buffer?	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)	Dissipator Pads Provided in Buffer?
(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)

Surface Water Body (3):	Swaim Creek	NCDWR Stream Index No.:	12-94-13-1
NCDWR Surface Water Classification for Water Body	Primary Classification:	Class C	
	Supplemental Classification:	None	
Other Stream Classification:	None		
Impairments:	None		
Aquatic T&E Species?	No	Comments:	
NRTR Stream ID:	ESE-S19, ESE-S42	Buffer Rules in Effect:	N/A
Project Includes Bridge Spanning Water Body?	No	Deck Drains Discharge Over Buffer?	N/A
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)	Dissipator Pads Provided in Buffer?
(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)



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Swales

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4	-L- 692+33 M	Fishers	0.0	4.0	6.0	0.5	45	292	2.08%	1.3	1.9	1.6	2.1	No	No
	36.1006784/-80.1362789	Branch													
5	-L- 703+50 M	Fishers	0.0	4.0	10.0	0.3	28	100	1.65%	0.9	1.5	1.2	1.6	No	No
	36.0976758/-80.1380454	Branch													
5	-L- 704+50 M	Fishers	0.0	4.0	10.0	0.3	33	150	1.17%	1.1	1.4	1.4	1.5	No	No
	36.0974187/-80.1381536	Branch													
5	-L- 704+50 RT	Fishers	0.0	4.0	4.0	0.1	14	150	1.60%	0.5	1.4	0.6	1.5	No	No
	36.0974854/-80.1384480	Branch													
5	-L- 707+50 RT	Fishers	0.0	6.0	4.0	0.1	9	150	0.23%	0.2	0.5	0.2	0.6	No	No
	36.0966710/-80.1387137	Branch													
5	-Y1B- 12+50 LT	Fishers	0.0	4.0	2.0	0.1	11	150	0.01%	0.4	0.2	0.5	0.2	No	No
	36.10011150/-80.1391462	Branch													
5	-Y1B- 13+00 LT	Fishers	0.0	4.0	2.0	0.1	7	100	0.13%	0.2	0.5	0.3	0.5	No	No
	36.1000860/-80.1390067	Branch													
5	-Y1B- 18+00 LT	Fishers	0.0	4.0	2.0	0.4	39	400	1.18%	1.3	1.7	1.6	1.9	No	No
	36.0986947/-80.1384805	Branch													
5	-Y1B- 12+50 RT	Fishers	0.0	4.0	2.0	0.2	15	150	0.30%	0.4	0.8	0.5	0.8	No	No
	36.0986184/-80.1389079	Branch													
5	-Y1B- 19+00 RT	Fishers	0.0	4.0	2.0	0.3	30	400	1.61%	0.6	1.7	0.8	1.8	No	No
	36.0983349/-80.1387000	Branch													
5	-Y1B- 20+50 RT	Fishers	2.0	2.0	2.0	1.1	113	253	0.50%	3.2	1.4	4.0	1.5	No	No
	36.0978718/-80.1385609	Branch													
6	-L- 706+00 M	Fishers	0.0	4.0	10.0	0.4	44	200	0.70%	1.4	1.2	1.8	1.3	No	No
	36.0970192/-80.1382776	Branch													
6	-L- 708+00 M	Fishers	0.0	4.0	10.0	0.4	39	200	0.67%	1.3	1.2	1.7	1.2	No	No
	36.0964794/-80.1384027	Branch													
6	-L- 710+00 M	Fishers	0.0	4.0	10.0	0.4	42	200	0.66%	1.4	1.2	1.7	1.3	No	No
	36.0959338/-80.1384811	Branch													
6	-L- 712+00 M	Fishers	0.0	4.0	10.0	0.7	67	300	0.67%	2.2	1.3	2.8	1.4	No	No
	36.0953852/-80.1385126	Branch													
6	-L- 715+00 M	Fishers	0.0	4.0	8.0	0.5	47	250	0.63%	1.5	1.2	1.9	1.3	No	No
	36.0945621/-80.1384714	Branch													
6	-L- 717+50 M	Fishers	0.0	4.0	6.0	0.6	64	409	0.65%	2.1	1.4	2.6	1.5	No	No
	36.0938820/-80.1383564	Branch													
6	-L- 710+50 LT	Fishers	0.0	6.0	4.0	1.3	128	250	0.50%	3.0	1.4	3.9	1.5	No	No
	36.0956113/-80.1384356	Branch													
6	-L- 711+00 LT	Fishers	0.0	6.0	4.0	1.3	128	300	0.94%	3.0	1.8	3.9	1.9	No	No
	36.0954521/-80.1382090	Branch													

Additional Comments



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Swales

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6	-L- 711+00 LT 36.0954521/-80.1382090	Fishers Branch	0.0	6.0	4.0	2.0	197	389	0.30%	4.7	1.3	6.0	1.4	No	No
6	-L- 715+00 LT 36.0945983/-80.1381676	Fishers Branch	0.0	6.0	4.0	0.4	40	150	0.72%	1.0	1.2	1.3	1.3	No	No
6	-L- 715+00 LT 36.0945983/-80.1381676	Fishers Branch	0.0	6.0	6.0	0.7	74	250	0.83%	1.9	1.5	2.4	1.6	No	No
6	-L- 707+50 RT 36.0968041/-80.1386987	Fishers Branch	0.0	6.0	4.0	0.3	25	200	0.38%	0.4	0.8	0.5	0.8	No	No
6	-L- 709+50 RT 36.0960971/-80.1387955	Fishers Branch	0.0	6.0	4.0	1.6	164	609	0.47%	2.5	1.3	3.2	1.4	No	No
6	-L- 715+50 RT 36.0943983/-80.1387565	Fishers Branch	0.0	6.0	4.0	0.3	30	150	0.69%	0.7	1.1	0.9	1.2	No	No
6	-L- 715+50 RT 36.0943983/-80.1387565	Fishers Branch	0.0	6.0	4.0	0.3	31	150	0.54%	0.7	1.0	0.9	1.1	No	No
6	-L- 717+50 RT 36.0938372/-80.1386614	Fishers Branch	0.0	6.0	5.0	0.2	17	50	0.30%	0.4	0.7	0.5	0.7	No	No
6	-L- 719+50 RT 36.0932869/-80.1385279	Fishers Branch	0.0	6.0	6.0	0.8	75	200	0.30%	1.6	1.0	2.1	1.0	No	No
6	-L- 726+00 LT 36.0916661/-80.1374075	Fiddlers Creek	0.0	6.0	9.0	0.9	85	100	0.84%	2.0	1.4	2.6	1.5	No	No
6	-L- 726+00 LT 36.0916661/-80.1374075	Fiddlers Creek	0.0	6.0	8.0	1.4	136	300	0.66%	3.2	1.5	4.1	1.6	No	No
6	-L- 729+00 LT 36.0908643/-80.1371730	Fiddlers Creek	0.0	6.0	8.0	0.8	76	300	0.67%	2.1	1.3	2.7	1.4	No	No
6	-L- 730+00 LT 36.0905980/-80.1370899	Fiddlers Creek	0.0	6.0	8.0	0.8	76	200	1.58%	2.1	1.8	2.7	2.0	No	No
6	-L- 725+00 RT 36.0918243/-80.1380437	Fiddlers Creek	0.0	6.0	4.0	0.3	28	50	0.84%	0.7	1.2	0.9	1.2	No	No
6	-L- 726+50 RT 36.0914156/-80.1379661	Fiddlers Creek	0.0	6.0	4.0	0.9	90	150	0.72%	1.9	1.4	2.5	1.5	No	No
6	-L- 726+50 RT 36.0914156/-80.1379661	Fiddlers Creek	0.0	6.0	4.0	0.9	90	250	0.69%	1.9	1.4	2.5	1.5	No	No
6	-L- 729+00 RT 36.0907482/-80.1377666	Fiddlers Creek	0.0	6.0	4.0	0.6	59	250	1.40%	1.7	1.8	2.1	1.9	No	No
6	-Y4RPC- 14+21 LT 36.0895946/-80.1375256	Fiddlers Creek	0.0	6.0	4.0	0.1	10	25	0.33%	1.2	0.6	0.3	0.7	No	No
6	-Y4RPC- 14+21 LT 36.0895946/-80.1375256	Fiddlers Creek	0.0	6.0	4.0	0.7	66	219	0.30%	1.6	1.0	2.0	1.1	No	No

Additional Comments



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Swales

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6	-Y4RPD- 13+33 RT	Fiddlers Creek	0.0	6.0	4.0	0.8	77	262	0.48%	2.2	1.3	2.8	1.4	No	No
	36.0895455/-80.1366931														
6	-Y1B- 34+50 RT	Fiddlers Creek	2.0	2.0	2.0	0.1	8	83	2.44%	0.2	1.0	0.3	1.1	No	No
	36.0947968/-80.1356940														
6	-L- 708+00 LT	Fiddlers Creek	0.0	2.0	2.0	0.4	40	75	1.60%	0.9	1.6	1.1	1.7	No	No
	36.0964426/-80.1381046														
7	-L- 737+00 M	Fiddlers Creek	0.0	6.0	5.0	0.4	35	335	1.33%	0.8	1.4	1.1	1.5	No	No
	36.0918351/-80.1368794														
7	-L- 737+00 RT	Fiddlers Creek	0.0	6.0	4.0	1.3	125	350	0.85%	3.0	1.7	3.8	1.8	No	No
	36.0886700/-80.1368347														
7	-NWL1- 15+50 RT	Fiddlers Creek	2.0	2.0	2.0	0.0	3	38	9.74%	0.1	1.0	0.1	1.1	No	No
	36.0891145/-80.1377104														
7	-NWL1- 17+56 RT	Fiddlers Creek	2.0	2.0	2.0	0.7	71	174	0.68%	1.7	1.3	2.2	2.4	No	No
	36.0885768/-80.1375024														
7	-L- 733+18 RT	Fiddlers Creek	0.0	2.0	2.0	0.2	24	52	2.32%	0.6	1.6	0.7	1.7	No	No
	36.0895946/-80.1375256														
7	-L- 737+00 RT	Fiddlers Creek	0.0	2.0	2.0	0.1	12	51	3.84%	0.3	1.7	0.4	1.8	No	No
	36.0886700/-80.1368347														
7	-SR1- 16+50 RT	Fiddlers Creek	0.0	2.0	2.0	0.4	39	166	2.20%	0.9	0.7	1.2	0.8	No	No
	36.0878445/-80.1360991														
7	-SR1- 20+74 LT	Fiddlers Creek	0.0	4.0	2.0	0.2	17	258	0.20%	0.4	1.7	0.5	1.8	No	No
	36.0867225/-80.1356815														
7	-NWL1- 18+75 RT	Fiddlers Creek	2.0	2.0	2.0	0.1	14	75	8.53%	0.3	1.8	0.4	1.9	No	No
	36.0882617/-80.1374055														
7	-NWL1- 20+43 RT	Fiddlers Creek	2.0	2.0	2.0	1.0	99	243	1.12%	2.3	1.7	3.0	1.8	No	No
	36.0878133/-80.1372779														
7	-NWL1- 20+70 RT	Fiddlers Creek	2.0	2.0	2.0	1.0	99	270	0.93%	2.3	1.6	3.0	1.7	No	No
	36.0877397/-80.1372613														
8	-L- 754+00 RT	Fiddlers Creek	2.0	2.0	2.0	0.2	17	50	2.80%	0.4	1.3	0.5	1.4	No	No
	36.0840573/-80.1365954														
9	-L- 769+50 LT	Fiddlers Creek	0.0	6.0	6.0	2.0	200	650	0.47%	6.4	1.6	8.3	1.7	No	No
	36.0825232/-80.1358857														
9	-L- 762+50 M	Fiddlers Creek	0.0	6.0	6.0	0.2	24	150	2.58%	0.5	1.6	0.7	1.7	No	No
	36.0818518/-80.1363079														
9	-L- 770+50 M	Fiddlers Creek	0.0	6.0	6.0	0.6	57	350	0.97%	1.5	1.4	1.9	1.5	No	No
	36.0795198/-80.1364511														
9	-L- 773+50 M	Fiddlers Creek	0.0	6.0	6.0	1.1	107	300	0.54%	2.8	1.4	3.5	1.4	No	No
	36.0786967/-80.1365019														

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10	-Y15FLYBD- 25+50 LT 36.0782290/-80.1376728	Fiddlers Creek	0.0	2.0	2.0	0.9	94	175	0.31%	1.6	1.0	2.1	1.1	No	No
10	-Y15RPB- 20+50 LT 36.0759891/-80.1400686	Fiddlers Creek	0.0	2.0	2.0	1.4	140	175	1.05%	2.4	1.8	3.1	1.9	No	No
10	-L- 773+50 RT 36.0895296/-80.1374963	Fiddlers Creek	0.0	6.0	6.0	2.3	230	750	0.64%	5.9	1.8	7.6	1.9	No	No
10	-L- 790+50 RT 36.0741606/-80.1377016	Fiddlers Creek	0.0	6.0	4.0	0.4	37	175	1.86%	1.1	1.8	1.4	1.9	No	No
10	-L- 798+50 RT 36.0721321/-80.1386442	Fiddlers Creek	0.0	4.0	3.0	0.9	88	350	0.39%	2.3	1.3	2.9	1.4	No	No
10	-L- 774+50 LT 36.0784408/-80.1368754	Fiddlers Creek	0.0	6.0	4.0	1.9	193	800	0.87%	3.3	1.8	4.3	1.9	No	No
10	-L- 782+50 LT 36.0761947/-80.1364914	Fiddlers Creek	0.0	6.0	6.0	0.2	16	50	2.76%	0.4	1.6	0.5	1.7	No	No
10	-L- 790+00 LT 36.0741653/-80.1370800	Fiddlers Creek	0.0	2.0	2.0	0.3	34	225	1.76%	0.6	1.8	0.8	1.9	No	No
10	-L- 733+50 M 36.0896047/-80.1371120	Fiddlers Creek	0.0	6.0	5.0	1.6	160	850	0.67%	4.1	1.7	5.3	1.8	No	No
10	-L- 782+00 M 36.0762398/-80.1368252	Fiddlers Creek	0.0	6.0	5.0	0.9	92	450	0.67%	2.4	1.5	3.0	1.6	No	No
10	-L- 786+50 M 36.0751611/-80.1370823	Fiddlers Creek	0.0	6.0	5.0	0.8	76	350	0.84%	2.0	1.5	2.5	1.6	No	No
10	-L- 790+00 M 36.0742274/-80.1373641	Fiddlers Creek	0.0	6.0	5.0	0.4	43	200	1.72%	1.1	1.7	1.4	1.8	No	No
10	-Y15FLYCA- 76+20 RT 36.0781488/-80.1355575	Fiddlers Creek	0.0	6.0	4.0	0.3	32	270	3.81%	0.6	2.0	0.7	2.1	No	No
10	-Y15FLYBD- 60+50 RT 36.0713379/-80.1340468	Fiddlers Creek	0.0	6.0	6.0	0.1	13	150	1.07%	0.2	0.9	0.3	1.0	No	No
10	-Y15REV- 48+64 RT 36.0742992/-80.1367863	Fiddlers Creek	0.0	6.0	6.0	0.2	24	136	2.51%	0.7	1.7	0.9	1.8	No	No
10	-Y15REV- 52+50 RT 36.0743956/-80.1354862	Fiddlers Creek	0.0	6.0	4.0	0.6	61	320	0.56%	1.7	1.3	2.2	1.4	No	No
10	-Y15REV- 65+40 RT 36.0747188/-80.1311390	Fiddlers Creek	0.0	6.0	4.0	2.4	240	970	0.52%	6.2	1.7	7.9	1.8	No	No
10	-Y15REV- 49+40 LT 36.0748370/-80.1365888	Fiddlers Creek	0.0	6.0	4.0	0.1	10	66	0.43%	0.3	0.8	0.4	0.8	No	No
10	-Y15REV- 49+40 LT 36.0748370/-80.1365888	Fiddlers Creek	0.0	6.0	4.0	0.8	76	310	0.81%	2.3	1.6	2.9	1.7	No	No

Additional Comments



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Swales

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Base Width (ft)	Front Slope (H:1)	Back Slope (H:1)	Drainage Area (ac)	Recommended Treatm't Length (ft)	Actual Length (ft)	Longitudinal Slope (%)	Q2 (cfs)	V2 (fps)	Q10 (cfs)	V10 (fps)	Rock Checks Used	BMP Associated w/ Buffer Rules?
10	-Y15REV- 54+00 LT 36.0749751/-80.1350413	Fiddlers Creek	0.0	6.0	6.0	0.2	24	100	3.66%	0.7	2.0	0.9	2.1	No	No
10	-Y15REV- 54+00 LT 36.0749751/-80.1350413	Fiddlers Creek	0.0	6.0	6.0	2.1	211	225	0.44%	5.4	1.5	7.0	1.6	No	No
10	-Y15LPA- 18+30 RT 36.0759679/-80.1357773	Fiddlers Creek	0.0	2.0	2.0	0.4	36	88	0.31%	0.8	0.8	1.0	0.9	No	No
10	-Y15LPA- 18+30 RT 36.0759679/-80.1357773	Fiddlers Creek	0.0	2.0	2.0	0.8	84	117	0.57%	1.8	1.3	2.3	1.4	No	No
11	-Y16- 28+50 RT 36.0674483/-80.1397486	Fiddlers Creek	0.0	4.0	2.0	0.2	24	131	1.80%	0.6	1.7	0.8	1.8	No	No
11	-Y16B- 12+50 LT 36.0672495/-80.1399005	Fiddlers Creek	0.0	4.0	2.0	0.3	25	138	0.34%	0.5	0.9	0.7	0.9	No	No
11	-Y16B- 12+00 RT 36.0671058/-80.1397792	Fiddlers Creek	0.0	4.0	2.0	0.1	11	125	0.86%	0.3	1.1	0.4	1.1	No	No
11	-L- 801+50 M 36.0712502/-80.1386544	Fiddlers Creek	0.0	6.0	6.0	0.5	47	250	1.28%	1.2	1.5	1.6	1.6	No	No
11	-L- 804+00 M 36.0706260/-80.1390070	Fiddlers Creek	0.0	6.0	6.0	0.9	94	500	0.63%	2.4	1.4	3.1	1.5	No	No
11	-L- 809+00 M 36.0694072/-80.1397865	Fiddlers Creek	0.0	6.0	6.0	0.5	52	250	0.53%	1.3	1.1	1.7	1.2	No	No
11	-L- 811+50 M 36.0688140/-80.1402126	Fiddlers Creek	0.0	6.0	6.0	0.3	33	150	0.53%	0.9	1.0	1.1	1.1	No	No
11	-L- 813+00 M 36.0684636/-80.1404796	Fiddlers Creek	0.0	6.0	6.0	1.7	172	1000	0.77%	4.4	1.4	5.7	1.5	No	No
11	-L- 823+00 M 36.0661876/-80.1423738	Swaim Creek	0.0	6.0	6.0	0.4	37	230	0.34%	1.0	0.7	1.2	0.8	No	No
11	-L- 825+30 M 36.0656658/-80.1428127	Swaim Creek	0.0	6.0	6.0	0.4	35	220	0.33%	0.9	0.7	1.2	0.8	No	No
11	-Y15RPD- 33+32 LT 36.0689516/-80.1394923	Fiddlers Creek	0.0	6.0	4.0	1.4	141	582	1.74%	3.0	1.9	3.9	2.0	No	No
11	-Y15RPD- 34+89 LT 36.0686338/-80.1398458	Fiddlers Creek	0.0	4.0	4.0	2.4	239	738	0.29%	5.1	1.4	6.6	1.5	No	No
11	-Y15FLYAC- 79+00 RT 36.0690725/-80.1409880	Fiddlers Creek	0.0	6.0	6.0	0.2	23	100	0.35%	0.5	0.8	0.6	0.8	No	No
11	-Y15FLYAC- 84+23 RT 36.0677911/-80.1417327	Fiddlers Creek	0.0	6.0	4.0	1.5	146	200	0.73%	3.1	1.6	4.0	1.7	No	No
11	-L- 801+50 LT 36.0711493/-80.1383719	Fiddlers Creek	0.0	6.0	4.0	0.4	36	250	1.28%	0.8	1.4	1.0	1.5	No	No

Additional Comments



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Swales

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Base Width (ft)	Front Slope (H:1)	Back Slope (H:1)	Drainage Area (ac)	Recommended Treatm't Length (ft)	Actual Length (ft)	Longitudinal Slope (%)	Q2 (cfs)	V2 (fps)	Q10 (cfs)	V10 (fps)	Rock Checks Used	BMP Associated w/ Buffer Rules?
11	-L- 804+00 LT 36.0705181/-80.1387291	Fiddlers Creek	0.0	6.0	6.0	1.1	105	500	0.63%	2.3	1.4	2.9	1.5	No	No
11	-L- 809+00 LT 36.0692854/-80.1395192	Fiddlers Creek	0.0	6.0	6.0	0.2	22	150	1.98%	0.5	1.4	0.6	1.5	No	No
11	-L- 812+50 LT 36.0684155/-80.1400668	Fiddlers Creek	0.0	4.0	4.0	1.0	100	350	0.63%	2.2	1.4	2.8	1.4	No	No
11	-L- 823+00 LT 36.0660109/-80.1420552	Fiddlers Creek	0.0	6.0	6.0	1.7	169	501	0.31%	3.6	1.3	4.7	1.4	No	No
11	-L- 804+00 RT 36.0707343/-80.1392850	Fiddlers Creek	0.0	6.0	4.0	0.9	94	450	0.64%	2.4	1.5	3.1	1.6	No	No
11	-L- 809+50 RT 36.0694122/-80.1401388	Fiddlers Creek	0.0	4.0	4.0	0.7	74	148	1.62%	1.3	2.0	2.0	2.1	No	No
11	-L- 811+00 RT 36.0690598/-80.1403898	Fiddlers Creek	0.0	6.0	4.0	0.7	74	200	0.53%	1.3	1.2	2.0	1.3	No	No
11	-L- 813+00 RT 36.0685972/-80.1407396	Fiddlers Creek	0.0	6.0	6.0	1.5	146	300	0.33%	3.1	1.2	4.0	1.2	No	No
11	-L- 816+00 RT 36.0679192/-80.1412983	Fiddlers Creek	0.0	6.0	6.0	1.5	146	300	0.49%	3.1	1.4	4.0	1.4	No	No
11	-L- 827+50 RT 36.0653701/-80.1435992	Swaim Creek	0.0	4.0	4.0	2.0	200	650	0.30%	4.3	1.3	5.5	1.4	No	No
11	-Y15RPC- 28+90 RT 36.0683966/-80.1414094	Fiddlers Creek	0.0	6.0	4.0	0.7	72	365	0.35%	1.5	1.0	2.0	1.1	No	No
11	-Y15RPC- 31+36 RT 36.0677911/-80.1417320	Fiddlers Creek	0.0	6.0	4.0	1.5	145	246	0.57%	3.1	1.5	4.0	1.6	No	No
11	-Y15RPC- 19+50 RT 36.0705722/-80.1421520	Fiddlers Creek	0.0	2.0	2.0	0.2	17	48	5.24%	0.4	2.0	0.5	2.1	No	No
11	-Y16- 16+10 LT 36.0666229/-80.1438385	Fiddlers Creek	0.0	4.0	2.0	0.8	83	290	1.26%	1.8	2.0	2.3	1.1	No	No
11	-Y16- 16+00 RT 36.0664973/-80.1438209	Swaim Creek	0.0	4.0	2.0	0.2	20	150	0.77%	0.6	1.2	0.8	1.3	No	No
11	-Y16C- 19+36 LT 36.0674474/-80.1405360	Fiddlers Creek	0.0	3.0	2.0	0.8	80	236	0.25%	1.9	1.1	2.2	1.1	No	No
11	-DR1- 10+90 RT 36.0651152/-80.1410598	Swaim Creek	0.0	3.0	2.0	0.4	43	127	0.30%	1.2	1.0	1.5	1.1	No	No
12	-L- 827+50 M 36.0651668/-80.1432325	Swaim Creek	0.0	6.0	6.0	0.4	35	225	0.32%	0.9	0.7	1.2	0.7	No	No
12	-L- 833+50 M 36.0638058/-80.1443775	Swaim Creek	0.0	6.0	6.0	1.0	96	600	1.55%	2.7	2.0	3.2	2.1	No	No

Additional Comments



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Swales

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12	-L- 836+32 M 36.0631661/-80.1449156	Swaim Creek	0.0	6.0	6.0	0.5	45	282	2.38%	1.2	1.9	1.5	2.0	No	No
13	-Y4- 18+25 LT 36.0910900/-80.1418435	Fiddlers Creek	0.0	4.0	2.0	1.8	176	225	0.24%	4.2	1.3	5.3	1.4	No	No
13	-Y4A- 14+92 RT 36.0921054/-80.1424339	Fiddlers Creek	0.0	4.0	5.0	0.4	35	342	1.08%	1.0	1.6	1.3	1.7	No	No
13	-Y4- 17+30 RT 36.0907011/-80.1419223	Fiddlers Creek	0.0	4.0	2.0	0.5	51	160	1.32%	1.4	1.9	1.8	2.0	No	No
13	-Y4- 18+90 RT 36.0909197/-80.1414658	Fiddlers Creek	0.0	4.0	2.0	0.0	4	35	0.80%	0.1	0.8	0.1	0.9	No	No
14	-Y1B- 40+50 LT 36.0943796/-80.1336890	Fiddlers Creek	0.0	4.0	2.0	0.1	7	50	2.76%	0.2	1.5	0.3	1.6	No	No
14	-Y1B- 40+50 LT 36.0943796/-80.1336890	Fiddlers Creek	0.0	4.0	2.0	1.0	103	417	0.31%	2.9	1.3	3.7	1.4	No	No
14	-Y4- 45+50 LT 36.0943101/-80.1334953	Fiddlers Creek	0.0	4.0	2.0	0.7	69	350	0.70%	1.9	1.6	2.5	1.7	No	No
14	-Y4- 46+50 LT 36.0944003/-80.1331776	Fiddlers Creek	0.0	4.0	2.0	0.7	69	250	1.23%	1.9	2.0	2.5	2.1	No	No
14	-Y4- 54+50 RT 36.0950524/-80.1305619	Fiddlers Creek	0.0	4.0	2.0	0.5	53	200	0.47%	1.5	1.3	1.9	1.4	No	No
14	-Y4- 47+50 RT 36.0941757/-80.1326709	Fiddlers Creek	0.0	4.0	2.0	1.1	114	500	0.75%	3.2	1.9	4.1	2.0	No	No
14	-Y4- 42+50 LT 36.0939850/-80.1344285	Fiddlers Creek	0.0	2.0	2.0	0.4	44	102	2.69%	0.8	1.9	1.0	2.0	No	No
15	-Y4- 60+50 RT 36.0958418/-80.1287779	Fiddlers Creek	0.0	4.0	2.0	0.2	22	277	1.88%	0.6	1.7	0.8	1.9	No	No
15	-Y4- 56+67 LT 36.0955228/-80.1300250	Fiddlers Creek	0.0	4.0	2.0	0.4	42	167	0.42%	1.2	1.9	1.5	2.0	No	No
17	-Y15- 36+88 RT 36.0695360/-80.1557027	Fiddlers Creek	0.0	4.0	4.0	1.1	111	248	0.31%	2.6	1.2	3.4	1.3	No	No
17	-Y15- 37+25 RT 36.0695845/-80.1555924	Fiddlers Creek	0.0	2.0	2.0	1.2	119	164	0.60%	2.3	1.4	3.0	1.5	No	No
17	-Y15- 43+30 RT 36.0703075/-80.1537474	Fiddlers Creek	0.0	6.0	4.0	1.3	128	520	0.44%	3.6	1.4	4.6	1.5	No	No
18	-Y15FLYCA- 12+52 RT 36.0710359/-80.1520417	Fiddlers Creek	0.0	6.0	4.0	0.1	11	52	4.04%	0.3	1.8	0.4	1.9	No	No
18	-Y15FLYCA- 16+72 RT 36.0714922/-80.1507606	Fiddlers Creek	0.0	6.0	4.0	0.5	47	278	1.18%	1.0	1.5	1.4	1.6	No	No

Additional Comments



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18	-Y15FLYCA- 16+72 RT 36.0714922/-80.1507606	Fiddlers Creek	0.0	2.0	2.0	0.1	8	76	5.56%	0.1	1.5	0.2	1.6	No	No
18	-Y15FLYCA- 18+93 LT 36.0718731/-80.1501056	Fiddlers Creek	0.0	6.0	6.0	0.7	67	195	0.98%	1.9	1.5	2.4	1.6	No	No
18	-Y15FLYCA- 16+72 RT 36.0715505/-80.1498332	Fiddlers Creek	2.0	2.0	2.0	0.5	47	281	3.58%	0.7	1.7	0.9	1.9	No	No
18	-Y15FLYCA- 17+50 RT 36.0715544/-80.1505121	Fiddlers Creek	2.0	2.0	2.0	0.5	47	203	4.86%	0.7	1.9	0.9	2.1	No	No
19	-Y15REV- 17+50 RT 36.0730679/-80.1470982	Fiddlers Creek	0.0	6.0	4.0	2.0	200	366	0.75%	4.5	1.8	5.7	1.9	No	No
19	-Y15REV- 30+50 LT 36.0743828/-80.1429621	Fiddlers Creek	0.0	6.0	6.0	1.9	187	200	0.30%	3.2	1.1	4.1	1.2	No	No
20	-Y15FLYBD- 76+00 RT 36.0730686/-80.1293328	Fiddlers Creek	0.0	6.0	4.0	0.3	29	100	2.64%	0.6	1.8	0.8	1.9	No	No
20	-Y15FLYBD- 87+60 RT 36.0742539/-80.1258580	Fiddlers Creek	0.0	6.0	4.0	0.6	57	260	2.17%	1.2	2.0	1.6	2.1	No	No
20	-NWY15FLYBD- 32+90 RT 36.0744672/-80.1247066	Fiddlers Creek	0.0	2.0	2.0	0.4	42	275	2.31%	0.7	1.7	0.9	1.9	No	No
20	-Y15FLYBD- 87+60 LT 36.0748911/-80.1260916	Fiddlers Creek	0.0	6.0	4.0	0.4	36	235	2.17%	0.8	1.7	1.0	1.9	No	No
20	-Y15REV- 80+50 RT 36.0748897/-80.1260687	Fiddlers Creek	0.0	4.0	4.0	1.0	103	300	0.86%	2.2	1.7	2.8	1.8	No	No
20	-Y15REV- 73+50 LT 36.0754219/-80.1284513	Fiddlers Creek	0.0	2.0	2.0	0.9	94	152	1.48%	2.4	2.0	3.0	2.1	No	No
20	-Y15REV- 65+34 LT 36.0751944/-80.1312128	Fiddlers Creek	0.0	6.0	4.0	3.3	332	759	0.34%	7.1	1.5	9.1	1.6	No	No
20	-Y15REV- 66+00 LT 36.0752319/-80.1309927	Fiddlers Creek	0.0	6.0	4.0	0.1	12	66	2.71%	0.3	1.4	0.3	1.5	No	No
20	-Y15REV- 67+50 LT 36.0752694/-80.1304873	Fiddlers Creek	0.0	6.0	4.0	0.4	40	216	0.59%	1.0	1.1	1.3	1.2	No	No
20	-Y15REV- 69+40 LT 36.0754002/-80.1298561	Fiddlers Creek	0.0	2.0	2.0	0.8	75	406	1.83%	1.6	1.9	2.1	2.1	No	No
21	-Y15FLYCA- 17+60 RT 36.0714969/-80.1504588	Fiddlers Creek	2.0	2.0	2.0	1.4	135	183	1.09%	4.2	2.0	5.4	2.1	No	No
21	-Y15FLYCA- 14+60 RT 36.0712785/-80.1514355	Fiddlers Creek	0.0	6.0	4.0	0.5	52	150	1.73%	1.6	1.9	2.0	2.0	No	No
22	-Y15- 154+00 RT 36.0748506/-80.1176827	Fiddlers Creek	0.0	6.0	4.0	1.7	168	300	0.76%	4.3	1.8	5.5	1.9	No	No

Additional Comments

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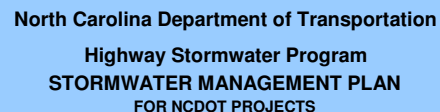
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Preformed Scour Holes and Energy Dissipators

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Energy Dissipator Type	Riprap Type	Drainage Area (ac)	Conveyance Structure	Pipe/Structure Dimensions (in)	Q10 (cfs)	V10 (fps)	BMP Associated w/ Buffer Rules?
6	-Y4- 40+43 RT 36.0933054/-80.1348169	(1)Fiddlers Creek	Riprap Energy Dissipator Basin	Class II	15.3	Pipe	36	31.8	1.0	N/A
7	-SR1- 16+49 LT 36.0878896/-80.1358437	(1)Fiddlers Creek	Riprap Energy Dissipator Basin	Class II	6.9	Pipe	30	21.0	1.0	N/A
9	-Y15FLYCA- 84+63 RT 36.0804600/-80.1358013	(1)Fiddlers Creek	PSH	Class 'B'	2.2	Pipe	18	7.4	0.4	N/A
10	-Y15FLYAC- 47+32 LT 36.0751525/-80.1338670	(1)Fiddlers Creek	PSH	Class 'B'	0.2	Pipe	15	0.7	0.2	N/A
10	-Y15RPB- 11+38 RT 36.0783088/-80.1387240	(1)Fiddlers Creek	PSH	Class 'B'	0.8	Pipe	18	3.2	0.3	N/A
10	-Y15REV- 45+38 RT 36.0741738/-80.1378812	(1)Fiddlers Creek	PSH	Class 'B'	0.2	Pipe	15	0.7	0.2	N/A
17	-Y15- 40+75 LT 36.0704817/-80.1549808	(1)Fiddlers Creek	PSH	Class 'B'	0.1	Pipe	15	0.6	0.2	N/A
18	-Y15- 50+50 LT 36.0717813/-80.1519421	(1)Fiddlers Creek	PSH	Class 'B'	0.3	Pipe	15	1.2	0.2	N/A
18	-Y15- 52+50 LT 36.0720079/-80.1513254	(1)Fiddlers Creek	PSH	Class 'B'	0.4	Pipe	15	2.0	0.2	N/A
18	-Y15- 55+50 LT 36.0724066/-80.1504363	(1)Fiddlers Creek	PSH	Class 'B'	0.4	Pipe	15	1.9	0.2	N/A
18	-Y15- 56+00 LT 36.0724731/-80.1502878	(1)Fiddlers Creek	Riprap Energy Dissipator Basin	Class II	42.4	Pipe	48	81.0	1.2	N/A
20	-Y15RPA- 13+58 RT 36.0765661/-80.1301464	(1)Fiddlers Creek	PSH	Class 'B'	0.3	Pipe	15	1.4	0.2	N/A
23	-Y15- 13+51 LT 36.0754558/-80.1133873	(1)Fiddlers Creek	PSH	Class 'B'	0.3	Pipe	15	1.5	0.2	N/A

Additional Comments

* Refer to the NCDOT Best Management Practices Toolbox (2014), NCDOT Standards, the Federal Highway Administration (FHWA) Hydraulic Engineering Circular No. 14 (HEC-14), Third Edition, Hydraulic Design of Energy Dissipators for Culverts and Channels (July 2006), as applicable, for design guidance and criteria.



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Additional Comments

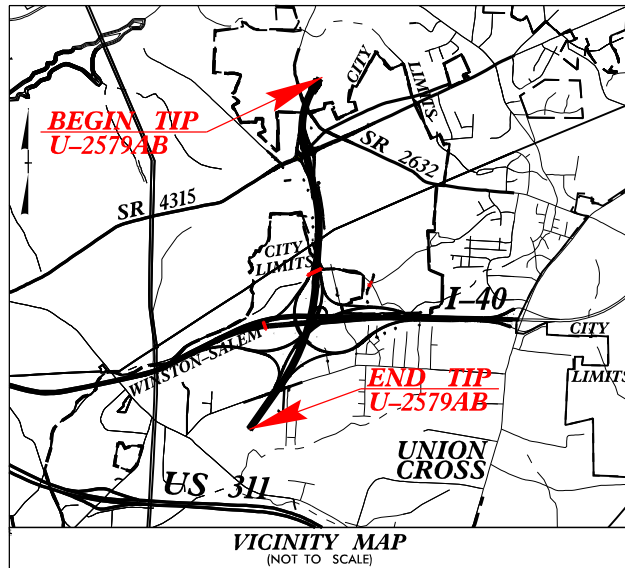
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See Sheet 1-A For Index of Sheets



VICINITY MAP
(NOT TO SCALE)

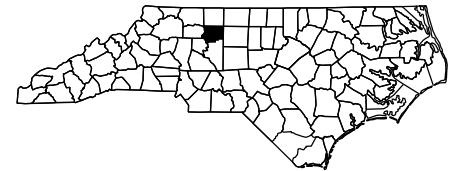
STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

FORSYTH COUNTY

LOCATION: WINSTON-SALEM - NORTHERN BELTWAY
(EASTERN SECTION OF FUTURE I-74)
FROM I-40 BUS /US 421 TO I-40

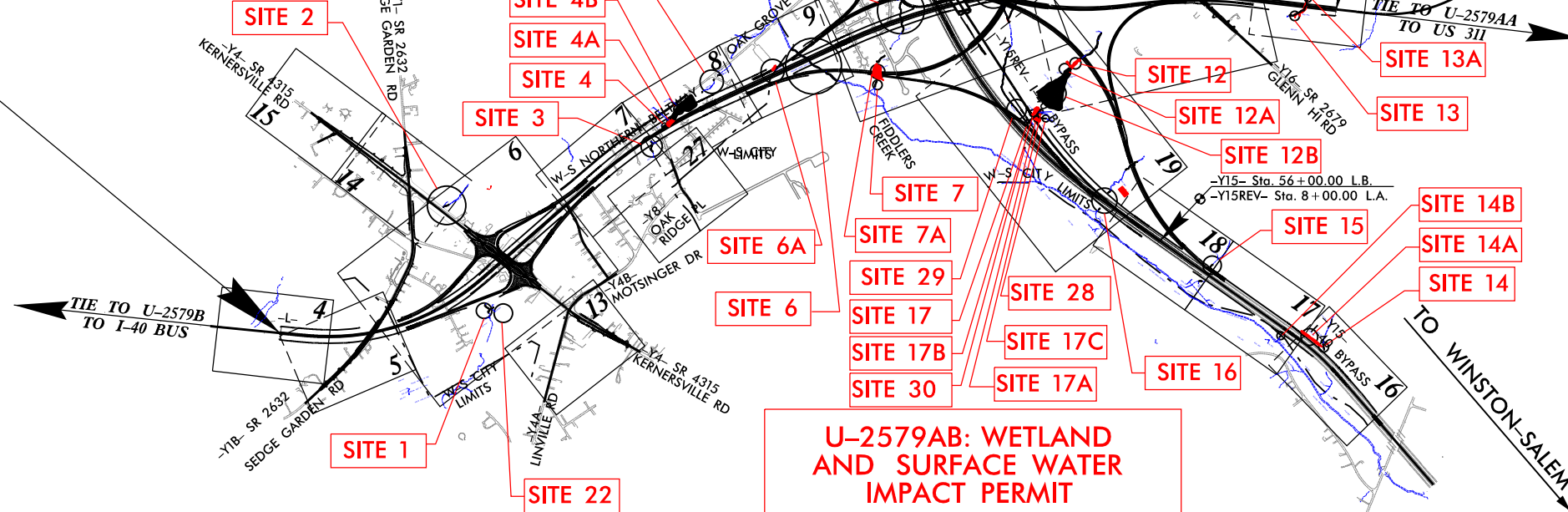
TYPE OF WORK: GRADING, PAVING DRAINAGE, STRUCTURES
SIGNALS, SIGNING AND PAVEMENT MARKERS

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	U-2579AB	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
34839.1.8		P.E.	



END TIP PROJECT U-2579AB
-L- STA. 836 + 32.44

BEGIN TIP PROJECT U-2579AB
-L- STA. 692 + 32.98

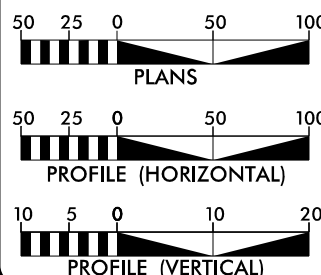


U-2579AB: WETLAND
AND SURFACE WATER
IMPACT PERMIT

PERMIT DRAWING
SHEET 1 OF 74

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

GRAPHIC SCALES



DESIGN DATA

ADT 2018 = 14,700
ADT 2040 = 20,200
K = 9 %
D = 70 %
T = 7 % *
V = 70 MPH
* TTST = 4% DUAL = 3%
FUNC CLASS =
INTERSTATE
STATEWIDE TIER

PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT U-2579AB = 2.727 MILES
TOTAL LENGTH TIP PROJECT U-2579AB = 2.727 MILES



Prepared in the Office of:
HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
TBD

LETTING DATE:
TBD

PHILLIP E. ROGERS, PE
PROJECT ENGINEER

CASEY E. HARRIS, PE
PROJECT DESIGN ENGINEER

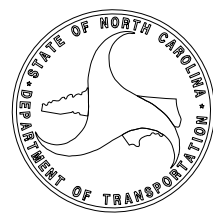
TATIA L. WHITE, PE, PLS
NCDOT CONTACT

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

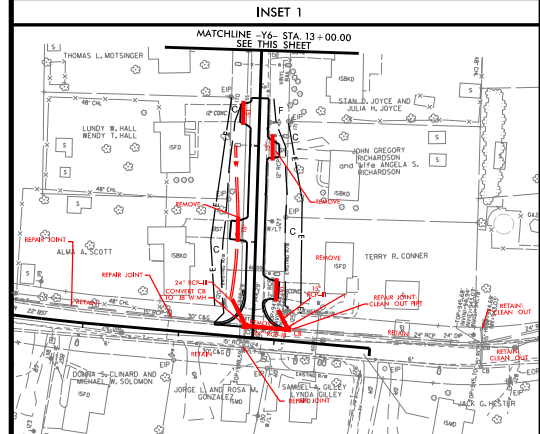
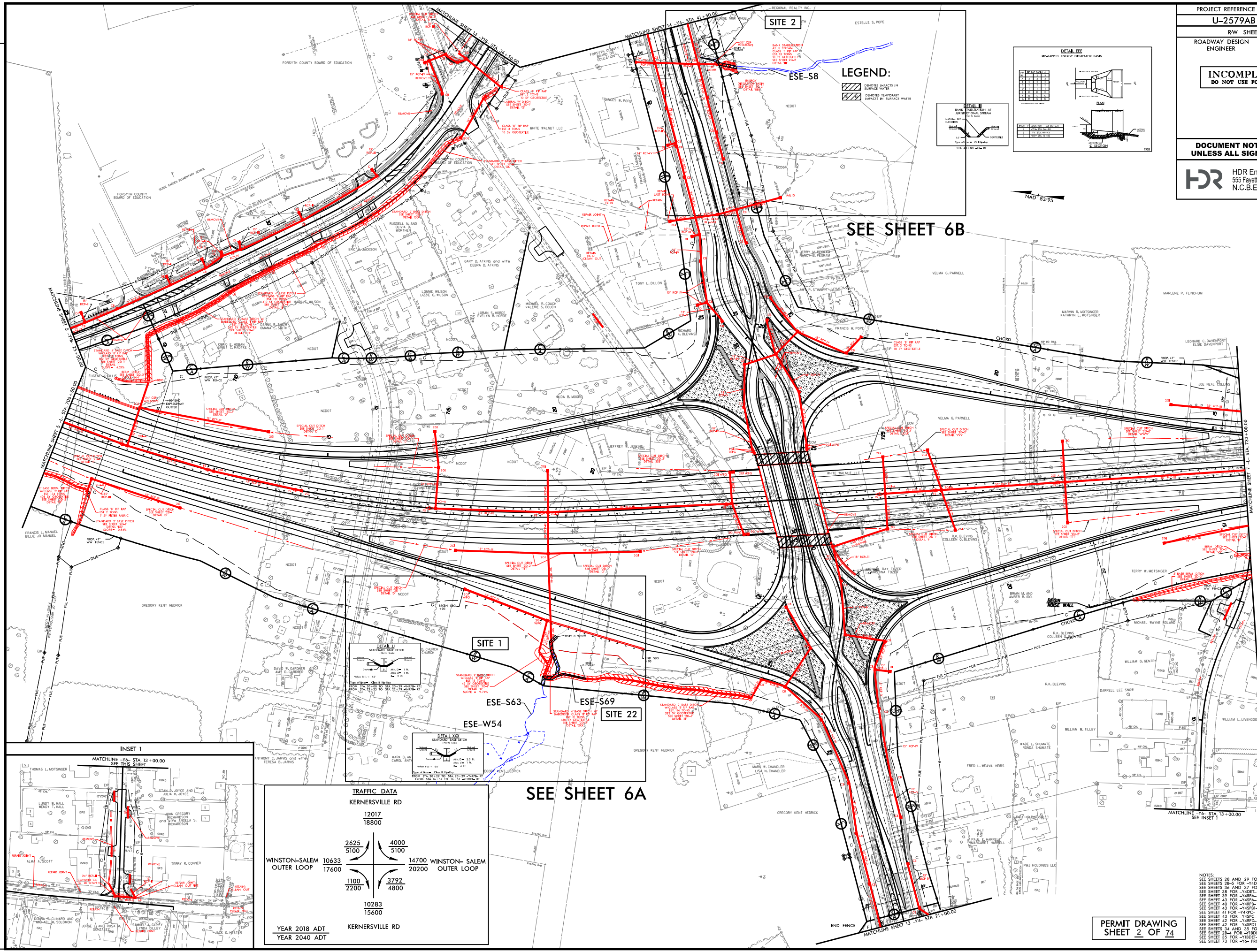
ROADWAY DESIGN
ENGINEER

SIGNATURE: _____ P.E.



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ROW REV. - SEPTEMBER 10, 2018 - ROW LINE ON PARCEL 45 MODIFIED TO ELIMINATE DUE AND ENCOMPASS ENTIRE PARCEL IN ROW. DUE AND ROW LINE MODIFIED ON PARCEL 46 TO TIE TO NEW ROW LINE. CEH



TRAFFIC DATA			
KERNERSVILLE RD			
12017 18800			
WINSTON-SALEM OUTER LOOP	10633 17600	2625 5100 4000 5100	14700 WINSTON- SALEM OUTER LOOP
	1100 2200	3792 4800	
10283 15600			
KERNERSVILLE RD			
YEAR 2018 ADT			
YEAR 2040 ADT			

PROJECT REFERENCE NO.
U-2579AB

SHEET NO.
6

ROADWAY DESIGN
ENGINEER

HYDRAULICS
ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR A/R ACQUISITION

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

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N.C.B.E.L.S. License Number: F-0116

50 25 0 25 50 100
GRAPHIC SCALE

NOTES:
SEE SHEETS 28 AND 29 FOR -L- PROFILE
SEE SHEETS 28-30 FOR -ADT- DETOUR PLANS AND CURVE DATA
SEE SHEETS 36 AND 37 FOR -Y4- PROFILE
SEE SHEET 38 FOR -ADT- PROFILE
SEE SHEET 39 FOR -Y4P- PROFILE
SEE SHEET 40 FOR -Y4P- PROFILE
SEE SHEET 41 FOR -Y4P- PROFILE
SEE SHEET 42 FOR -Y4P- AND -Y4P2- PROFILES
SEE SHEET 43 FOR -Y4P- PROFILE
SEE SHEET 44 FOR -Y4P- PROFILE
SEE SHEET 45 FOR -Y4P- PROFILE
SEE SHEET 46 FOR -Y4P- PROFILE
SEE SHEET 47 FOR -Y4P- AND -Y4P2- PROFILES
SEE SHEETS 34 AND 35 FOR -Y4- PROFILE
SEE SHEET 36 FOR -Y4P- DETOUR PLANS AND CURVE DATA
SEE SHEET 37 FOR -Y4P- PROFILE
SEE SHEET 38 FOR -Y4P- PROFILE

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REVISIONS

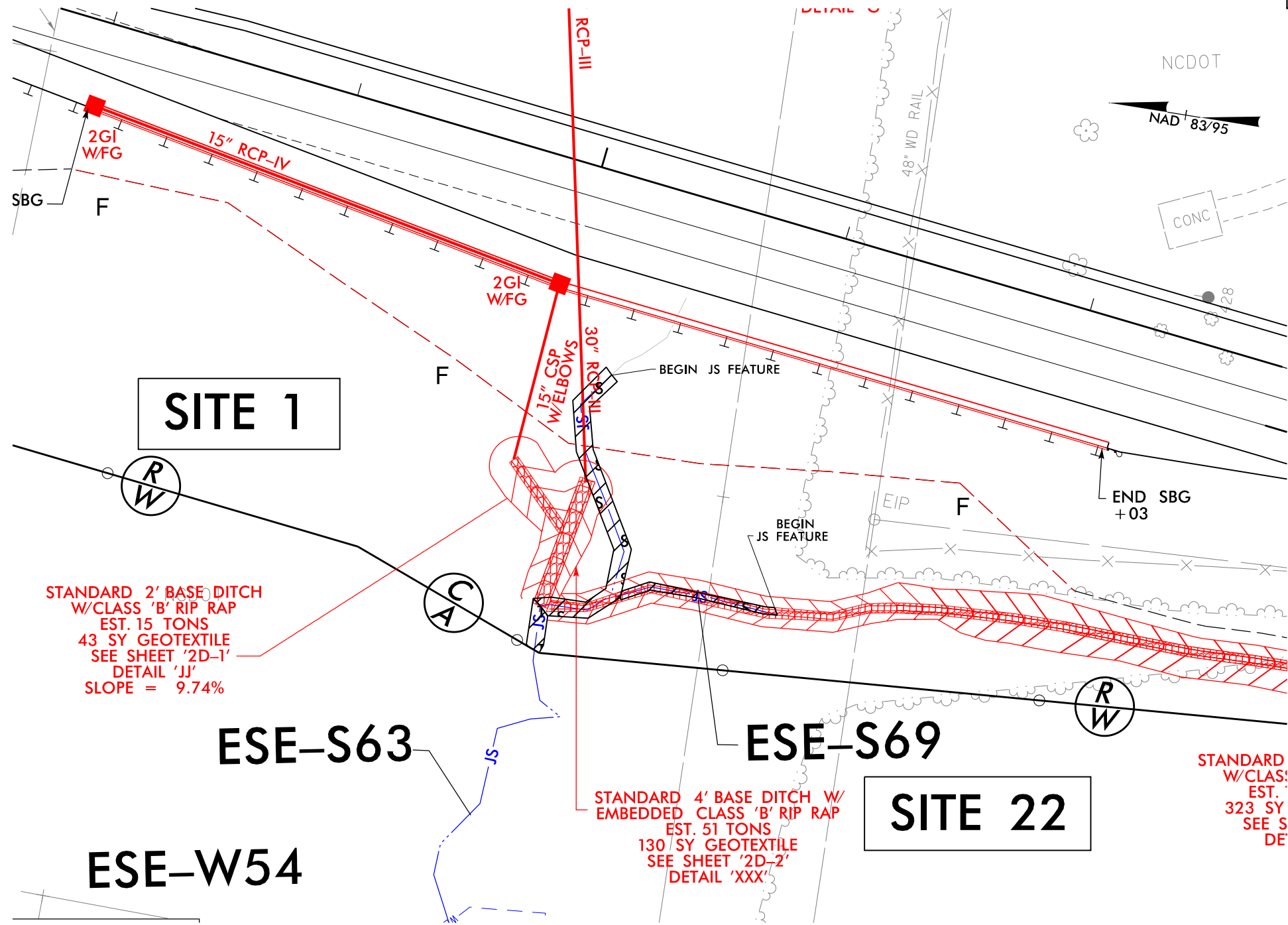
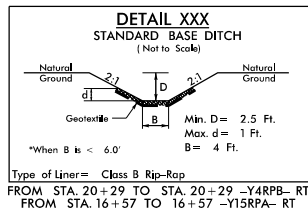
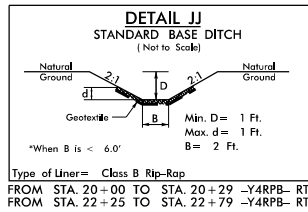
LEGEND:



DENOTES IMPACTS IN
SURFACE WATER

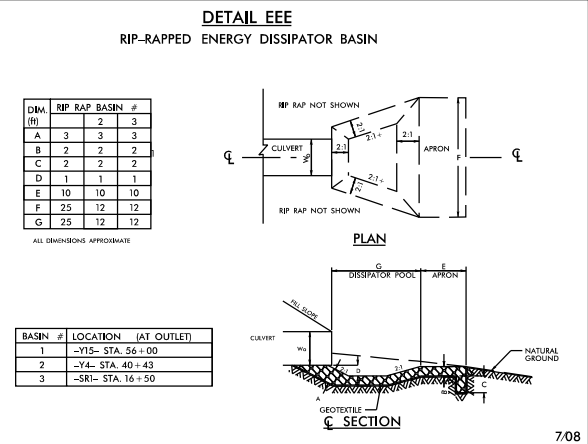
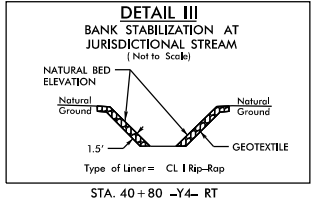
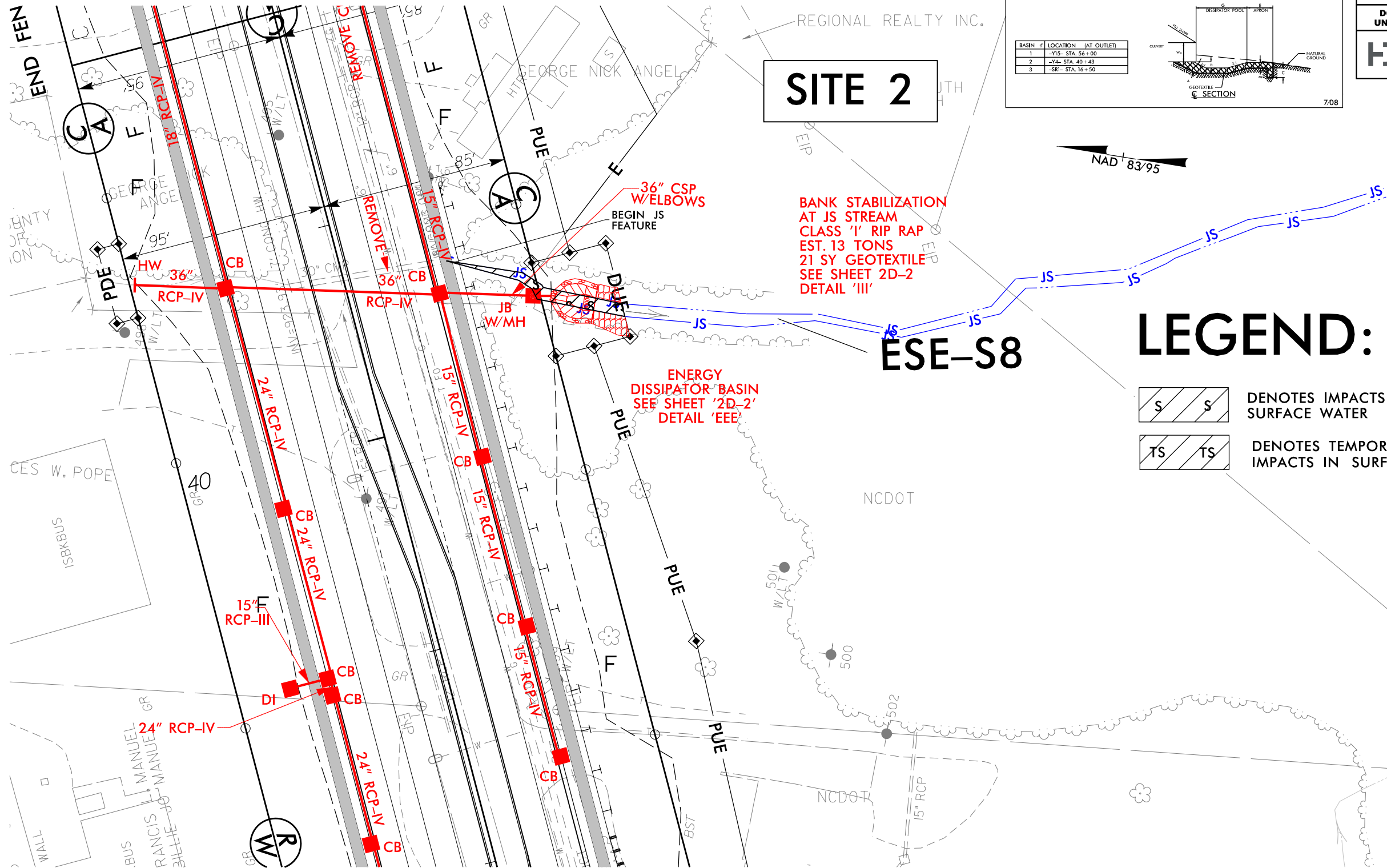


DENOTES TEMPORARY
IMPACTS IN SURFACE WATER



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INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
 HDR Engineering, Inc. of the Carolinas 555 Fayetteville St, Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-01116			
12.50 0 12.5 25  GRAPHIC SCALE			

REVISIONS



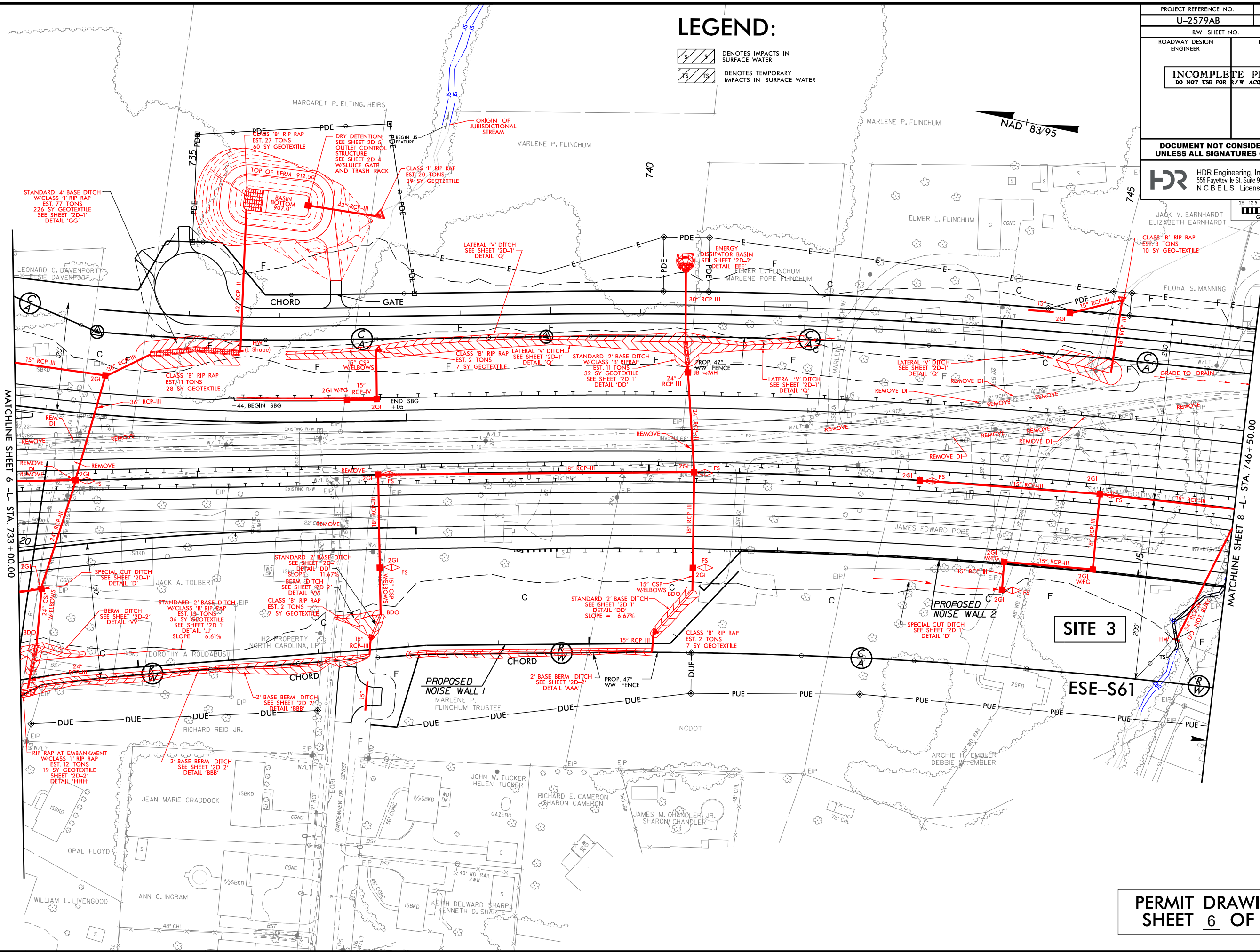
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INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
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 GRAPHIC SCALE	

LEGEND:

- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER

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REVISIONS



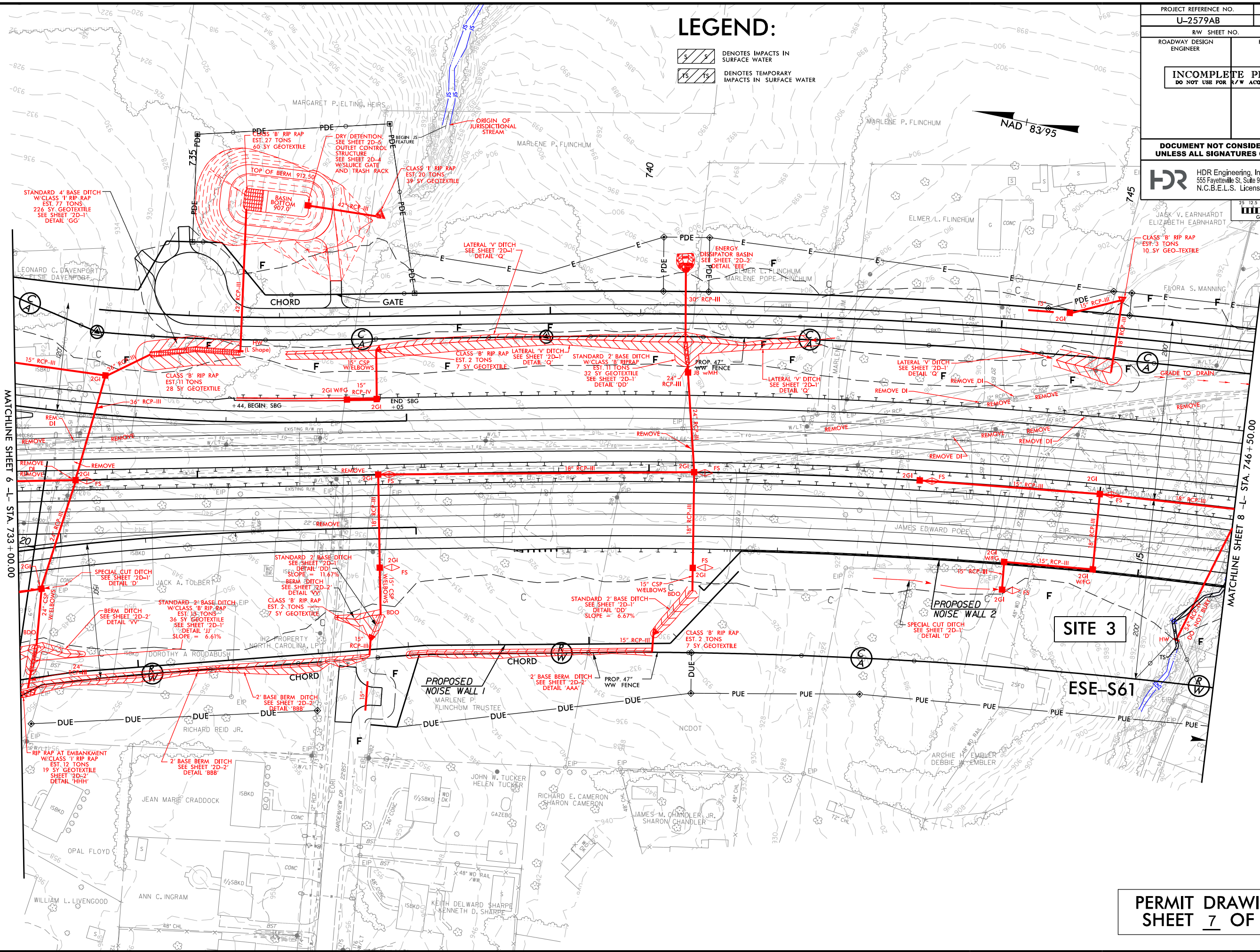
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- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER

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RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
HDR Engineering, Inc. of the Carolinas 555 Fayetteville St., Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116			
		25 12.5 0 12.5 25 GRAPHIC SCALE	

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REVISIONS



LEGEND:

- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO. U-2579AB		SHEET NO. 7	
RW SHEET NO.		HYDRAULICS ENGINEER	
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INCOMPLETE PLANS DO NOT USE FOR A/C ACQUISITION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
HDR Engineering, Inc. of the Carolinas 555 Fayetteville St., Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116			
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REVISIONS

5/14/99

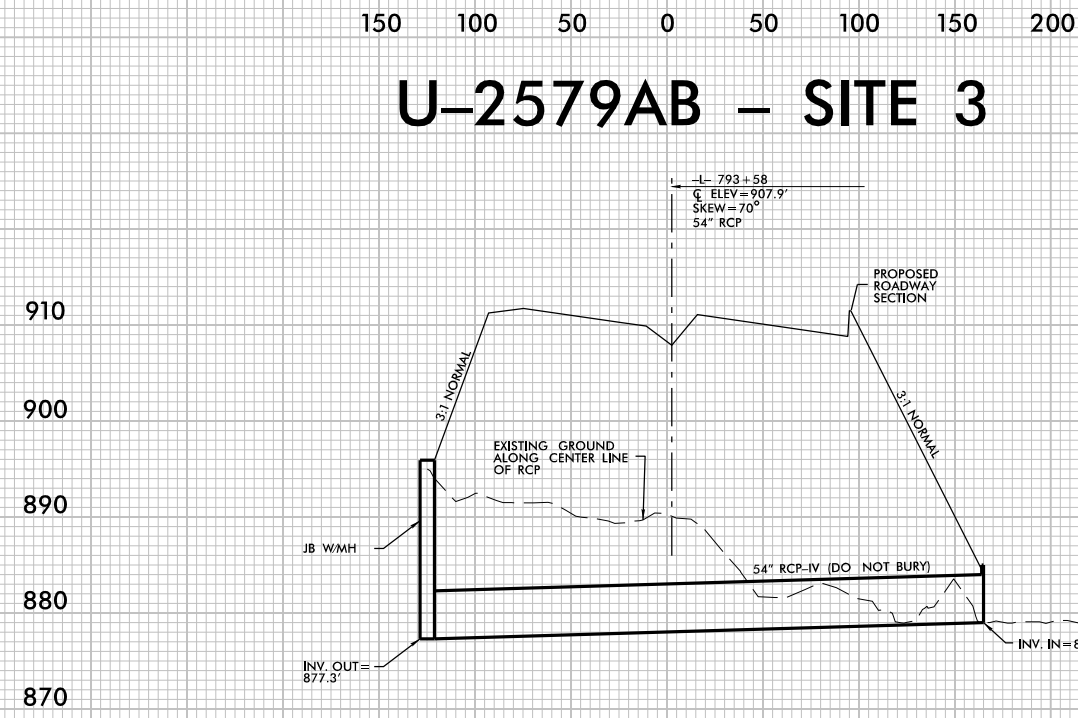


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555 Fayetteville St, Suite 900 Raleigh, N.C. 27601

N.C.B.E.L.S. License Number: F-0116

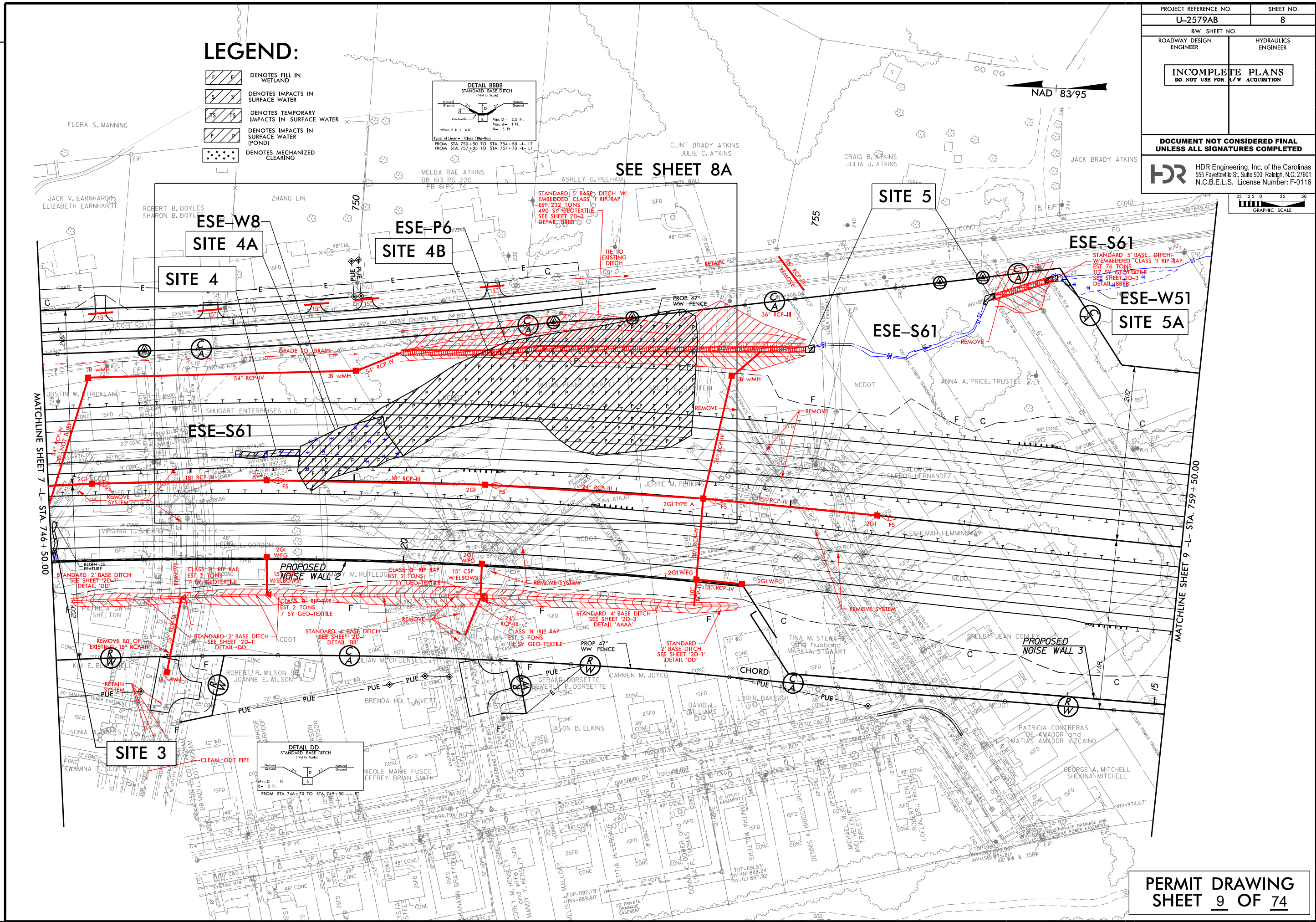
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PROFILE ALONG C OF PIPE

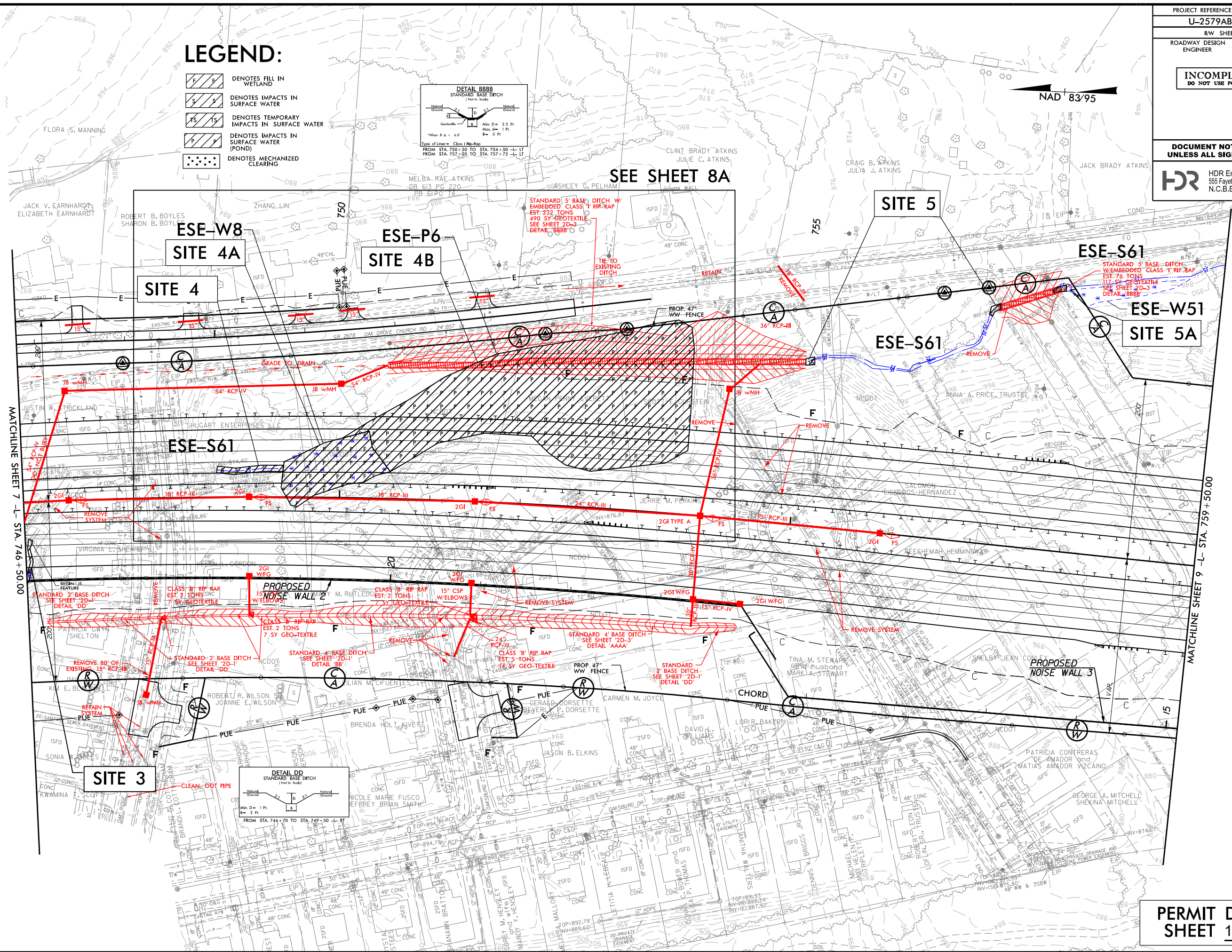
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REVISIONS



PROJECT REFERENCE NO.		SHEET NO.	
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RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
HDR HDR Engineering, Inc. of the Carolinas 555 Fayetteville St, Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116			
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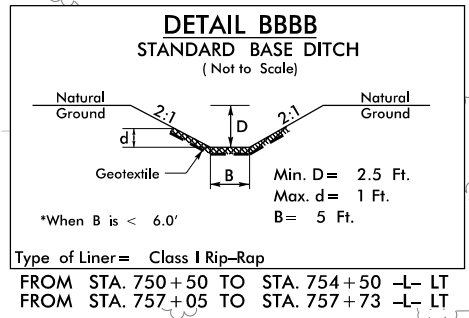
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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
HDR Engineering, Inc. of the Carolinas 555 Fayetteville St, Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116	



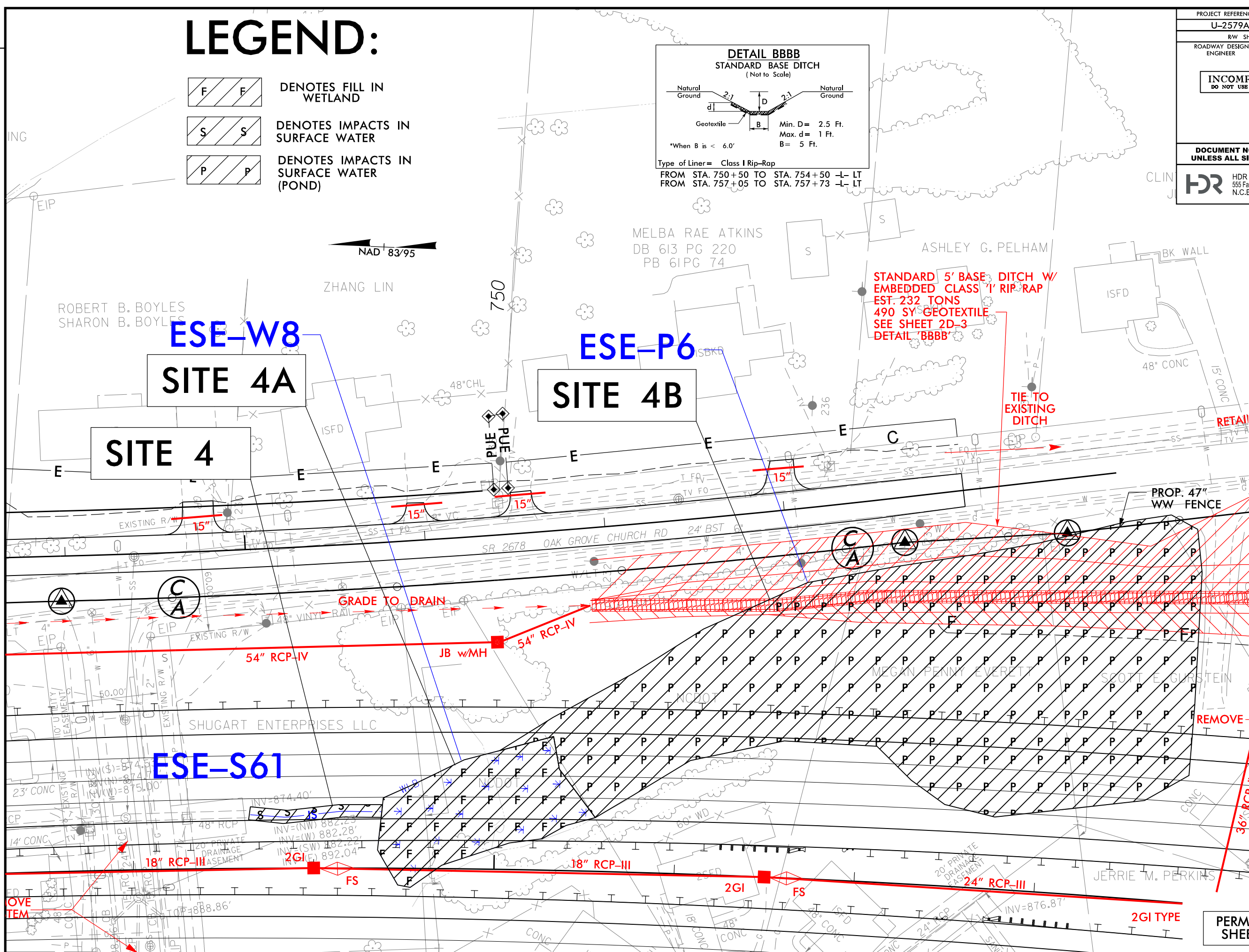
PERMIT DRAWING
SHEET 10 OF 74

LEGEND:

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



PROJECT REFERENCE NO. U-2579AB		SHEET NO. 8A	
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ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
HDR Engineering, Inc. of the Carolinas 555 Fayetteville St, Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116			

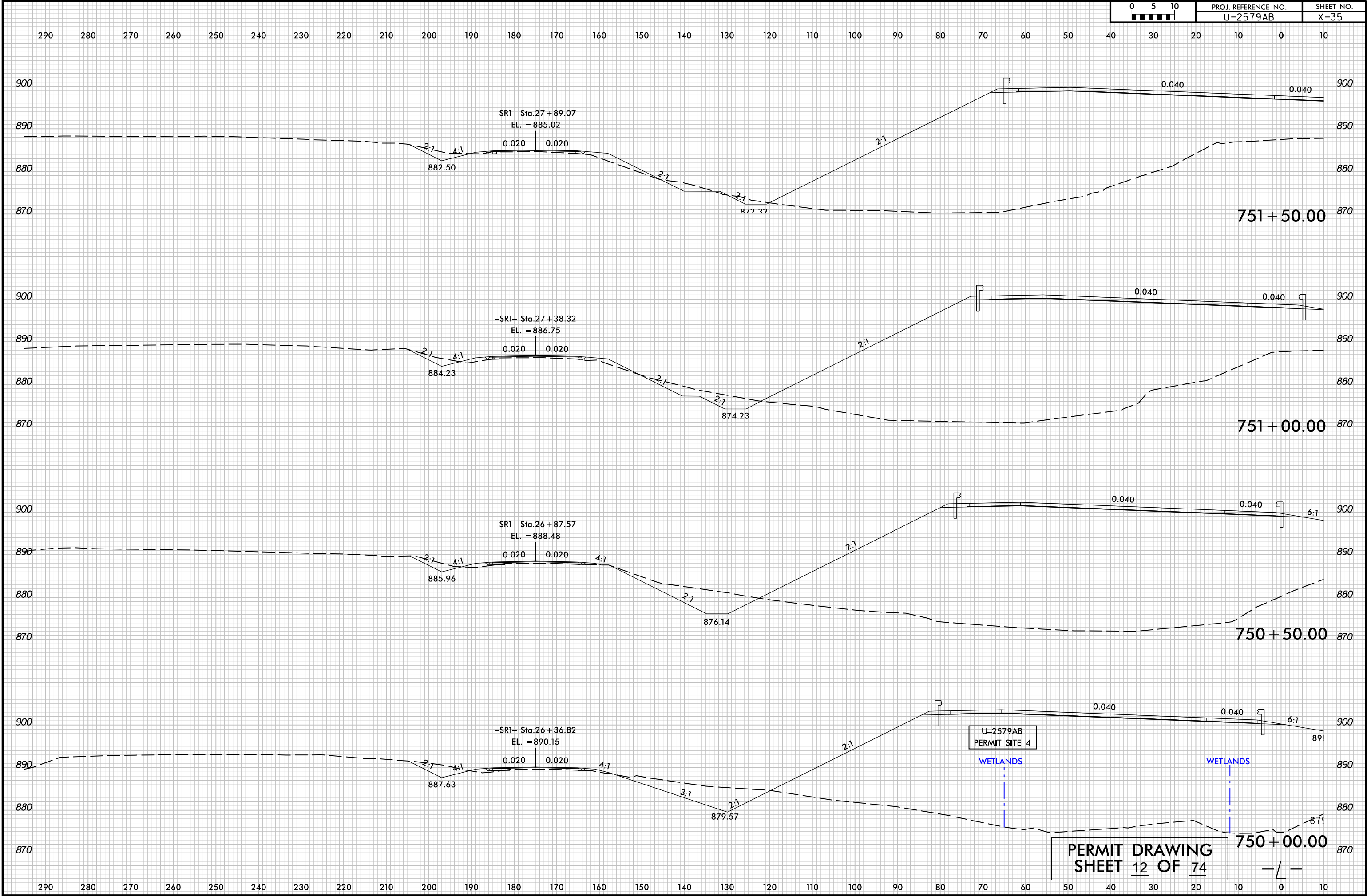


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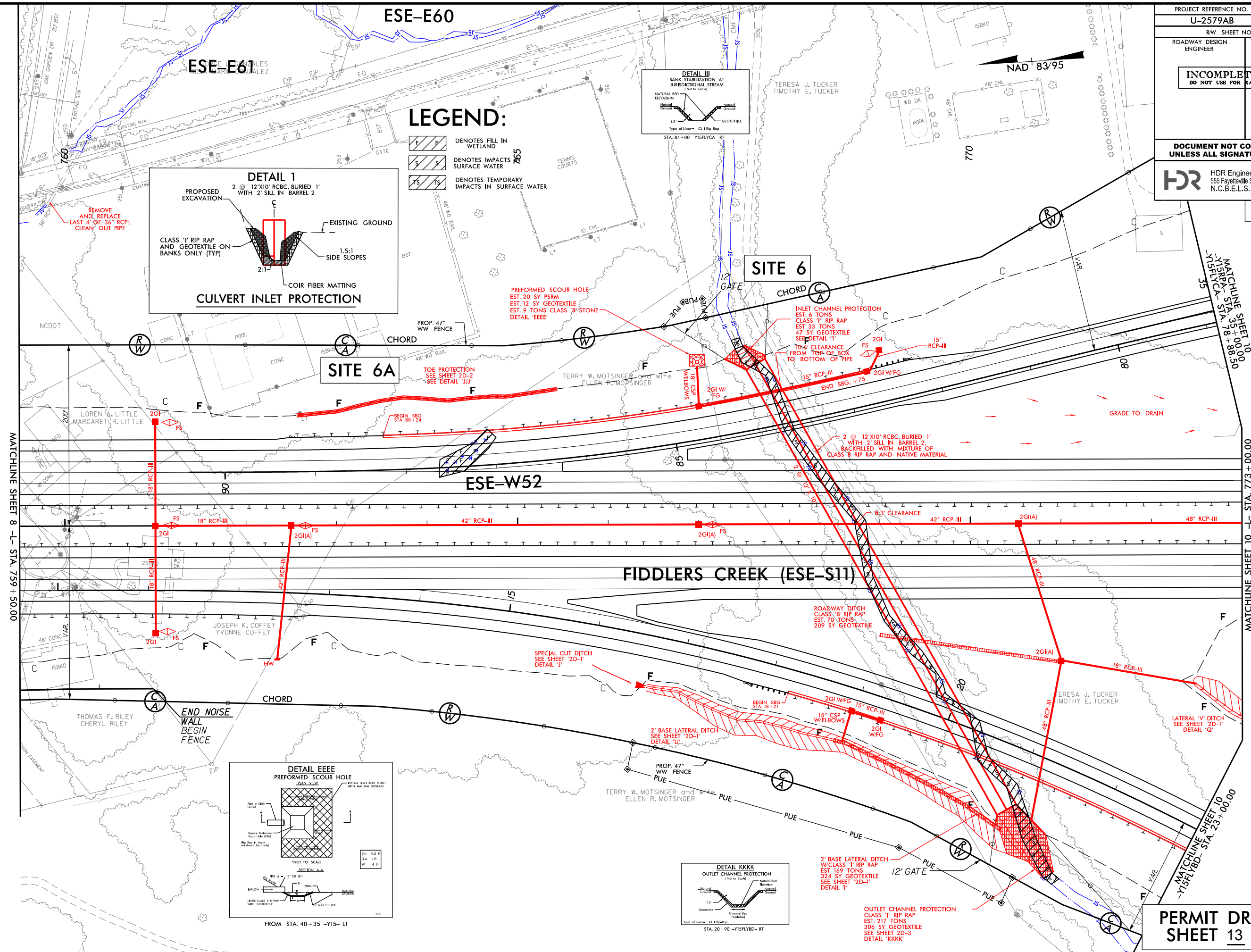
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REVISIONS

8/23/99



PERMIT DRAWING
SHEET 13 OF 74



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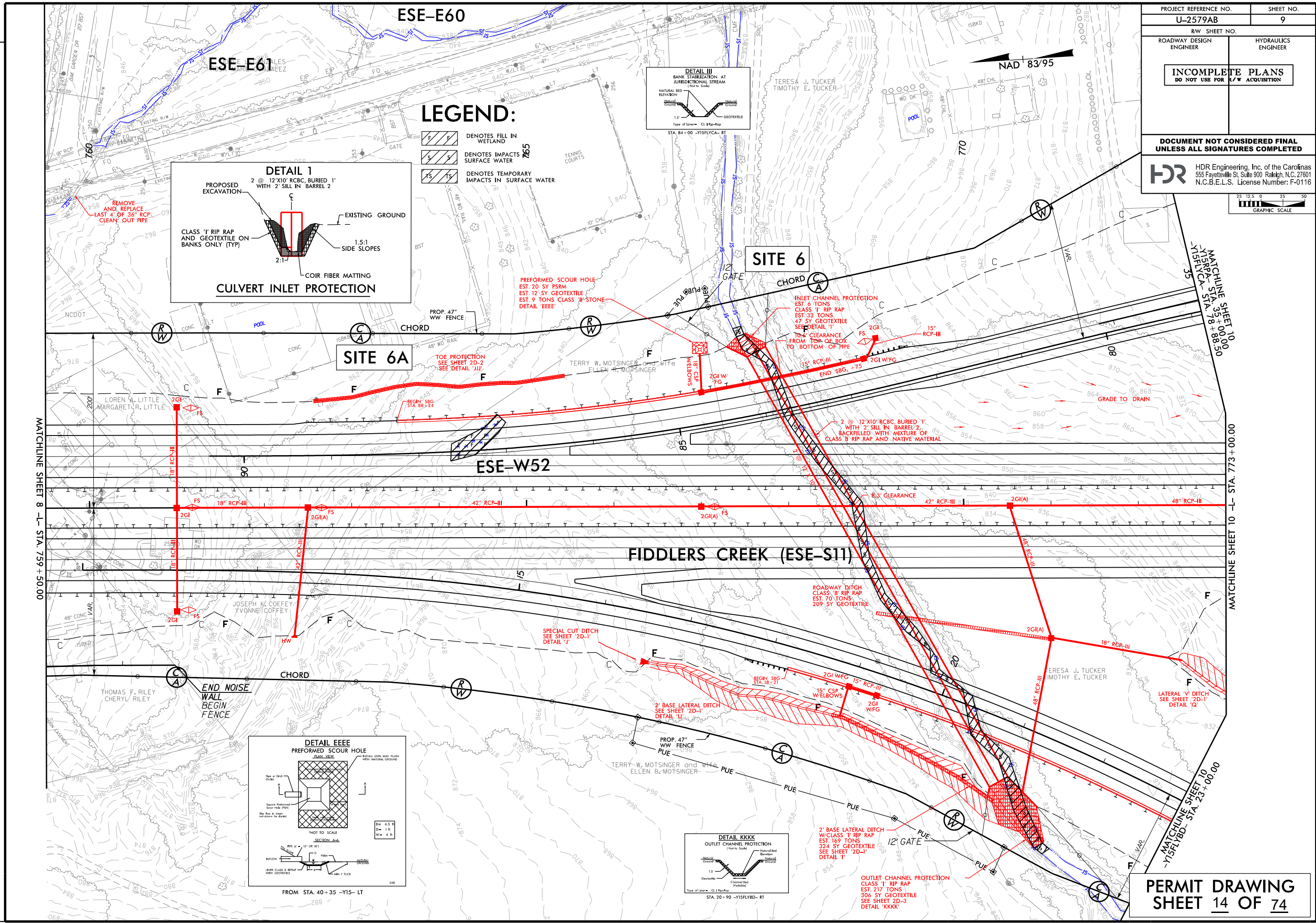
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REVISIONS

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REVISIONS



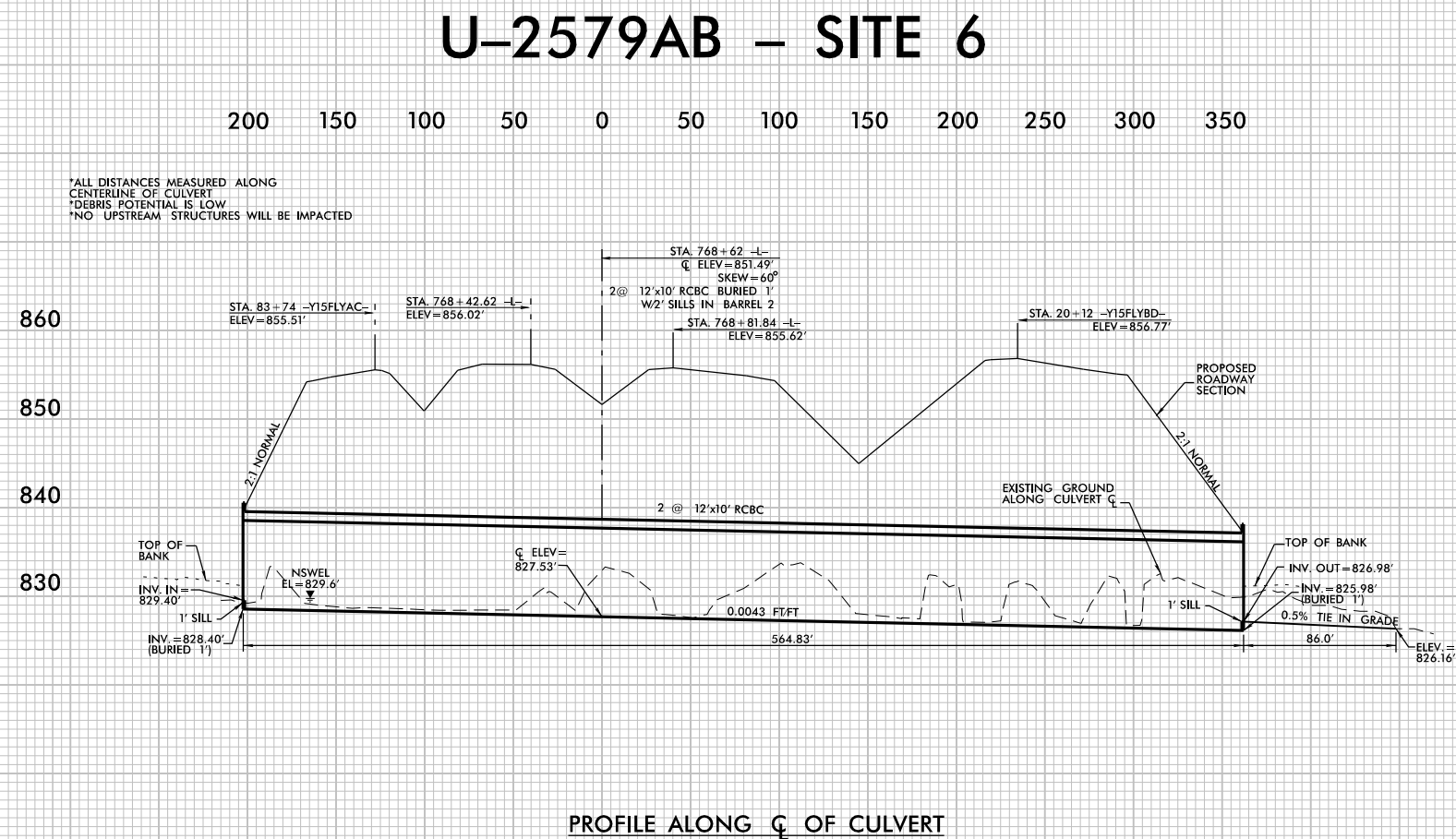
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INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
HDR HDR Engineering, Inc. of the Carolinas 555 Fayetteville St., Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116			



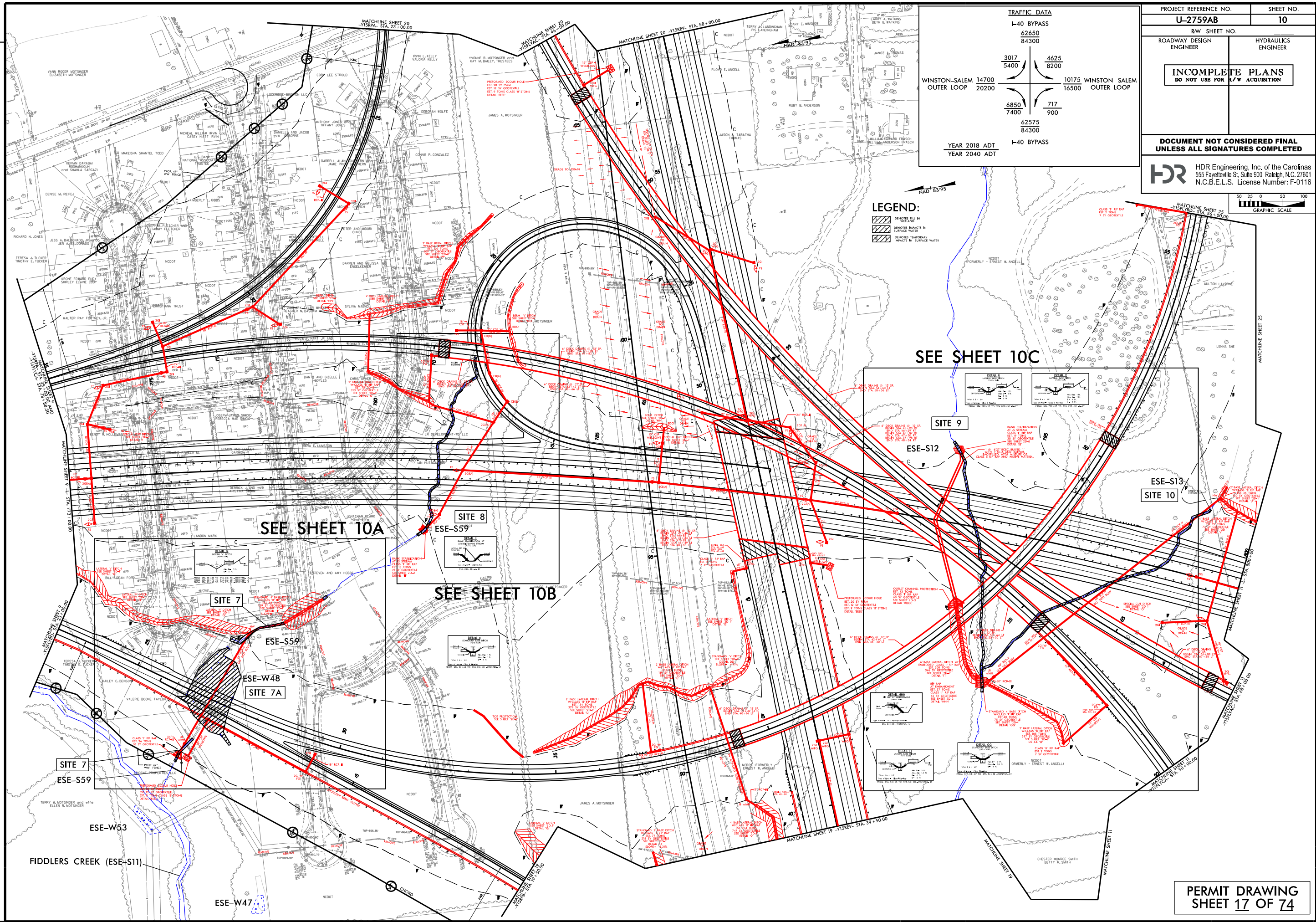
REVISIONS

5/14/99

	HDR Engineering, Inc. of the Carolinas 555 Fayetteville St, Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116	PROJECT REFERENCE NO.		SHEET NO.	
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	ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER		
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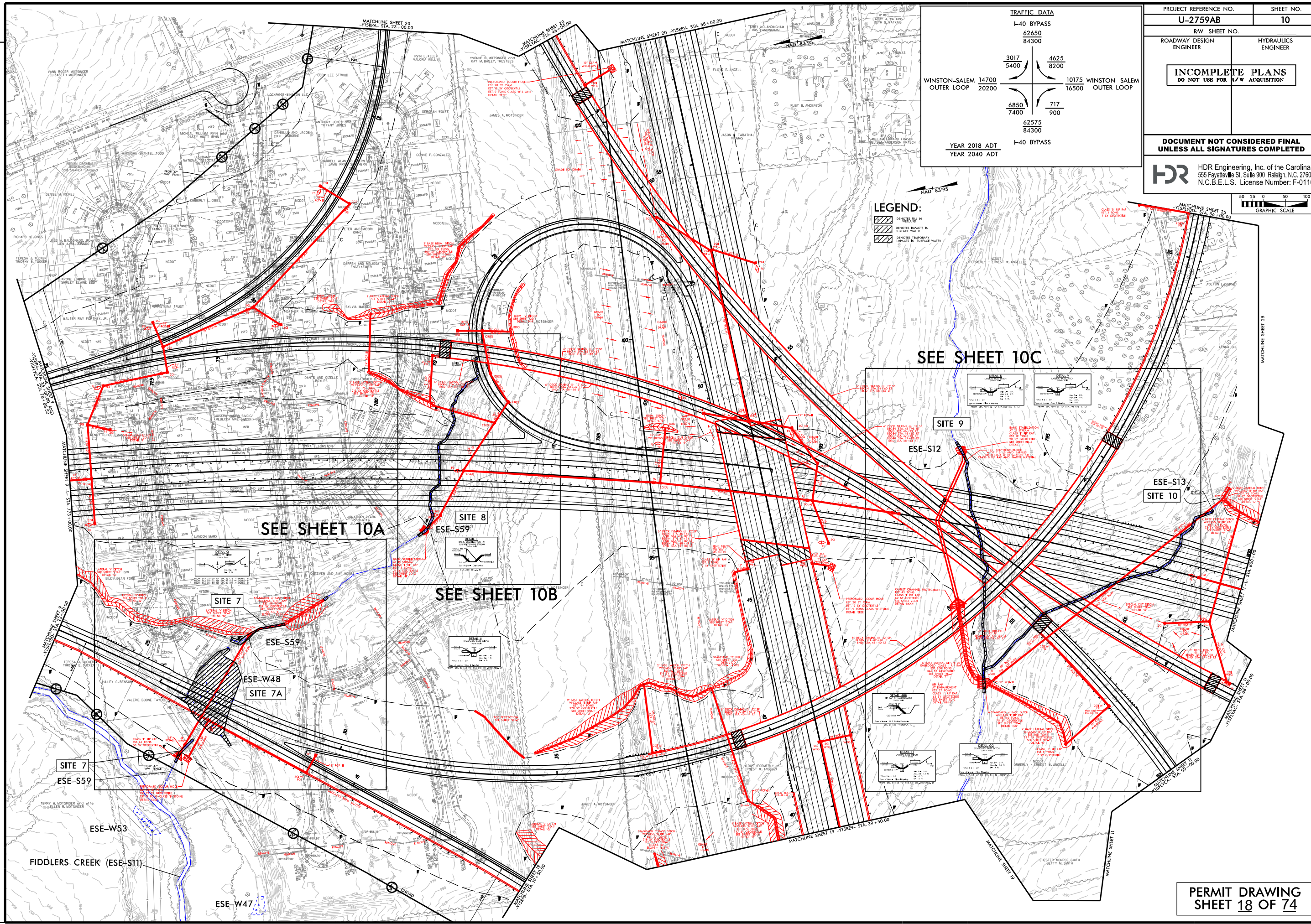
REVISIONS



TRAFFIC DATA	
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10175	16500
14700	20200
6850	717
7400	900
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I-40 BYPASS	
YEAR 2018 ADT	
YEAR 2040 ADT	

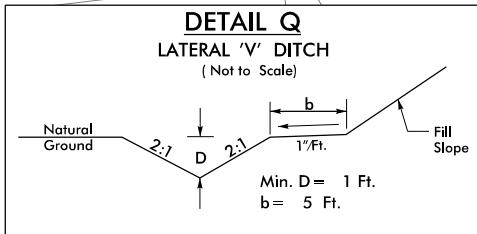
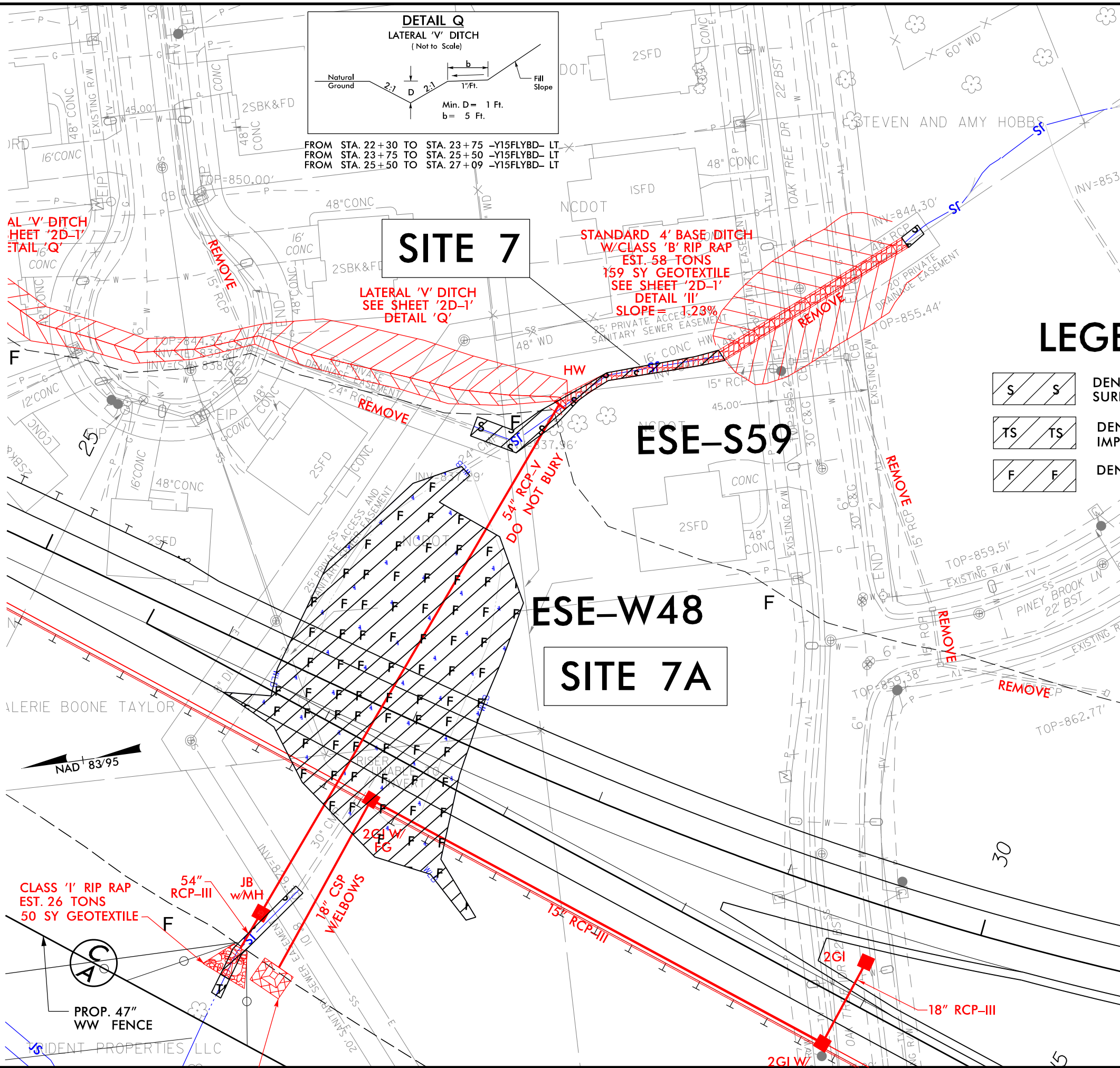
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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		
HDR Engineering, Inc. of the Carolinas 555 Fayetteville St, Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116		

REVISIONS



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REVISIONS

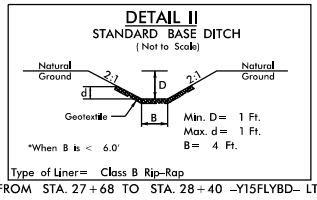


FROM STA. 22+30 TO STA. 23+75 -Y15FLYBD- LT
FROM STA. 23+75 TO STA. 25+50 -Y15FLYBD- LT
FROM STA. 25+50 TO STA. 27+09 -Y15FLYBD- LT

PROJECT REFERENCE NO. U-2579AB		SHEET NO. 10A	
RW SHEET NO. ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
HDR Engineering, Inc. of the Carolinas 555 Fayetteville St, Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-01116			
 GRAPHIC SCALE			

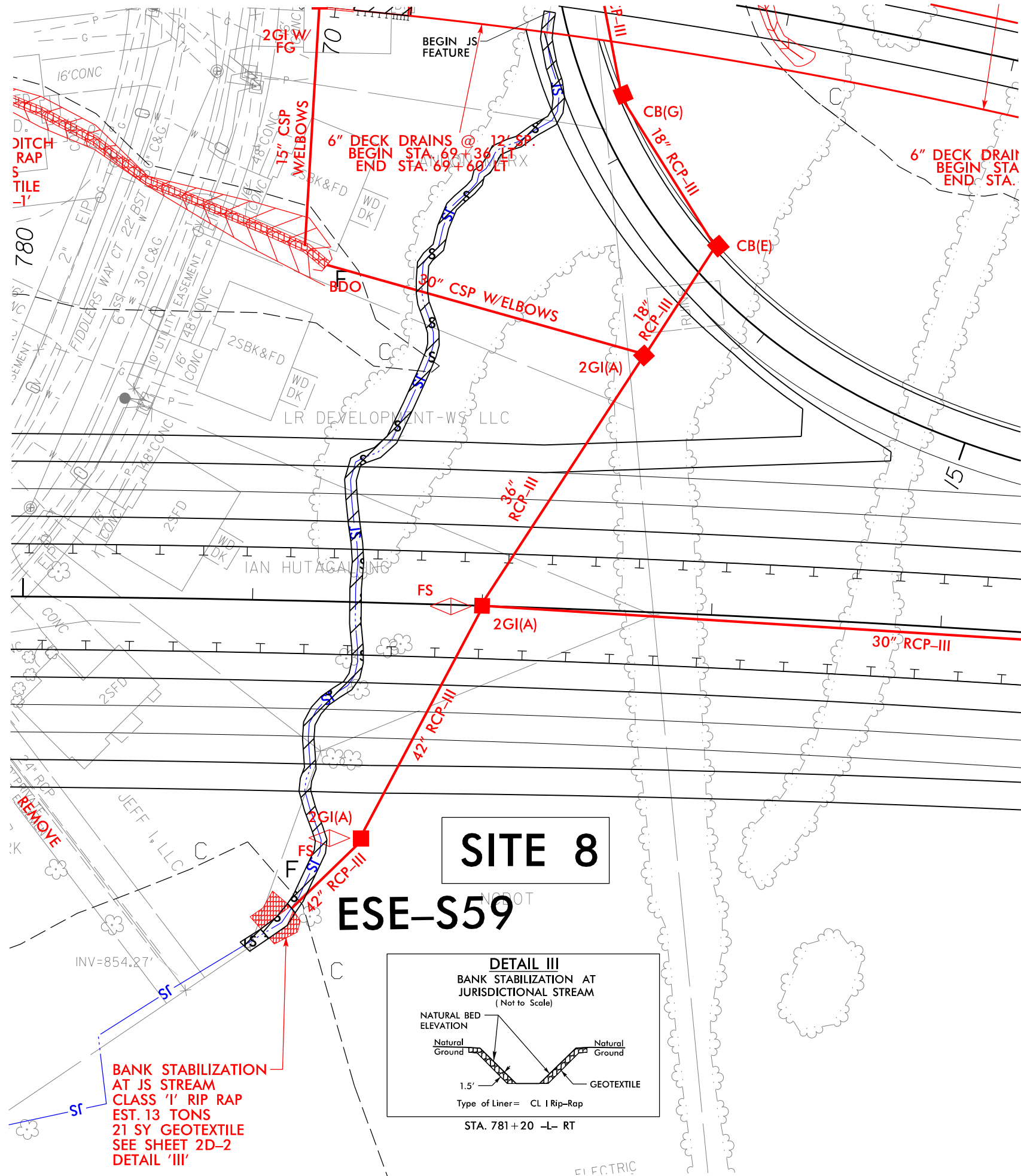
LEGEND:

- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES FILL IN WETLAND

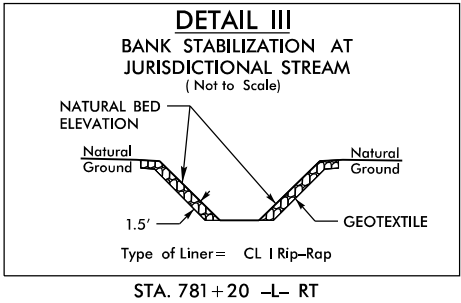


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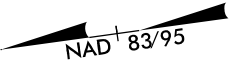


SITE 8
ESE-S59



BANK STABILIZATION AT JS STREAM
CLASS 'I' RIP RAP
EST. 13 TONS
21 SY GEOTEXTILE
SEE SHEET 2D-2
DETAIL 'III'

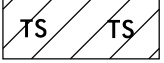
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U-2579AB	10B
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INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
HDR Engineering, Inc. of the Carolinas 555 Fayetteville St, Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116	
12.5 0 12.5 25 GRAPHIC SCALE	



LEGEND:



DENOTES IMPACTS IN SURFACE WATER

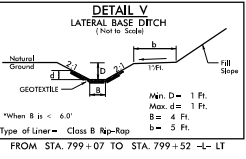


DENOTES TEMPORARY IMPACTS IN SURFACE WATER

 DENOTES IMPACTS IN SURFACE WATER

 DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SEE SHEET 29 FOR -L- PROFILE
SEE SHEET 41 FOR -Y4RPC- PROFILE
SEE SHEET 42 FOR -Y4RPD PROFILE



SITE 10

DETAIL GG
STANDARD BASE DITCH
 (Not to Scale)

Diagram showing a cross-section of a ditch with a 2:1 slope on both sides. The ditch is lined with Geotextile. The ditch depth is labeled D, and the ditch width at the bottom is labeled B. The ditch is flanked by Natural Ground.

Min. D = 2 Ft.
 Max. D = 1.5 Ft.
 B = 4 Ft.

*When B is < 6.0'

Type of Liner - Class II Rip-Rap

OM STA. 54+37 TO STA. 54+40 -Y15FLYCA- L

ERLY - ERNEST W. ANGELL

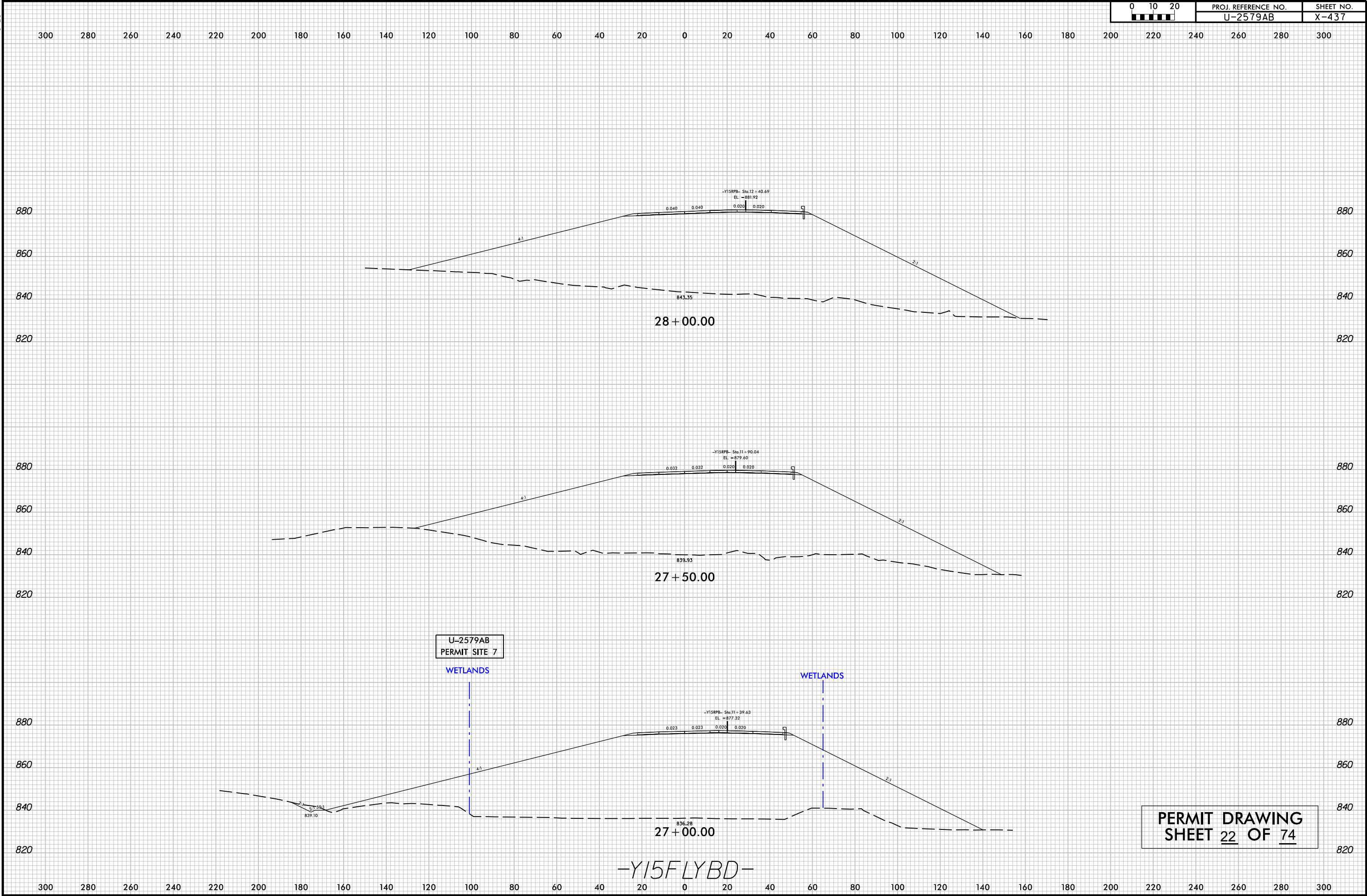
6" DECK DRAINS
@ 12' SP.
BEGIN STA. 66+08 LT
END STA. 67+28 LT

REVISIONS:

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USER: _USERNAME_ DATE: 11/16/2018
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8/23/99

0 10 20 [Scale Bar]	PROJ. REFERENCE NO.	SHEET NO.
	U-2579AB	X-437



PERMIT DRAWING
SHEET 22 OF 74

-Y15FLYBD-

REVISIONS

5/14/99

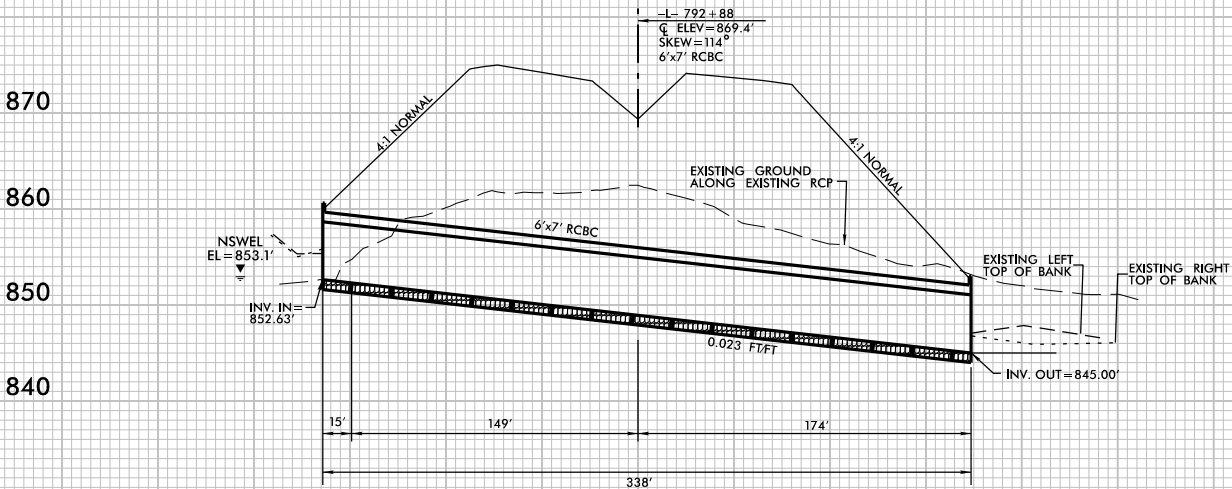


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N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.		SHEET NO.
U-2579AB		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	

U-2579AB – SITE 9

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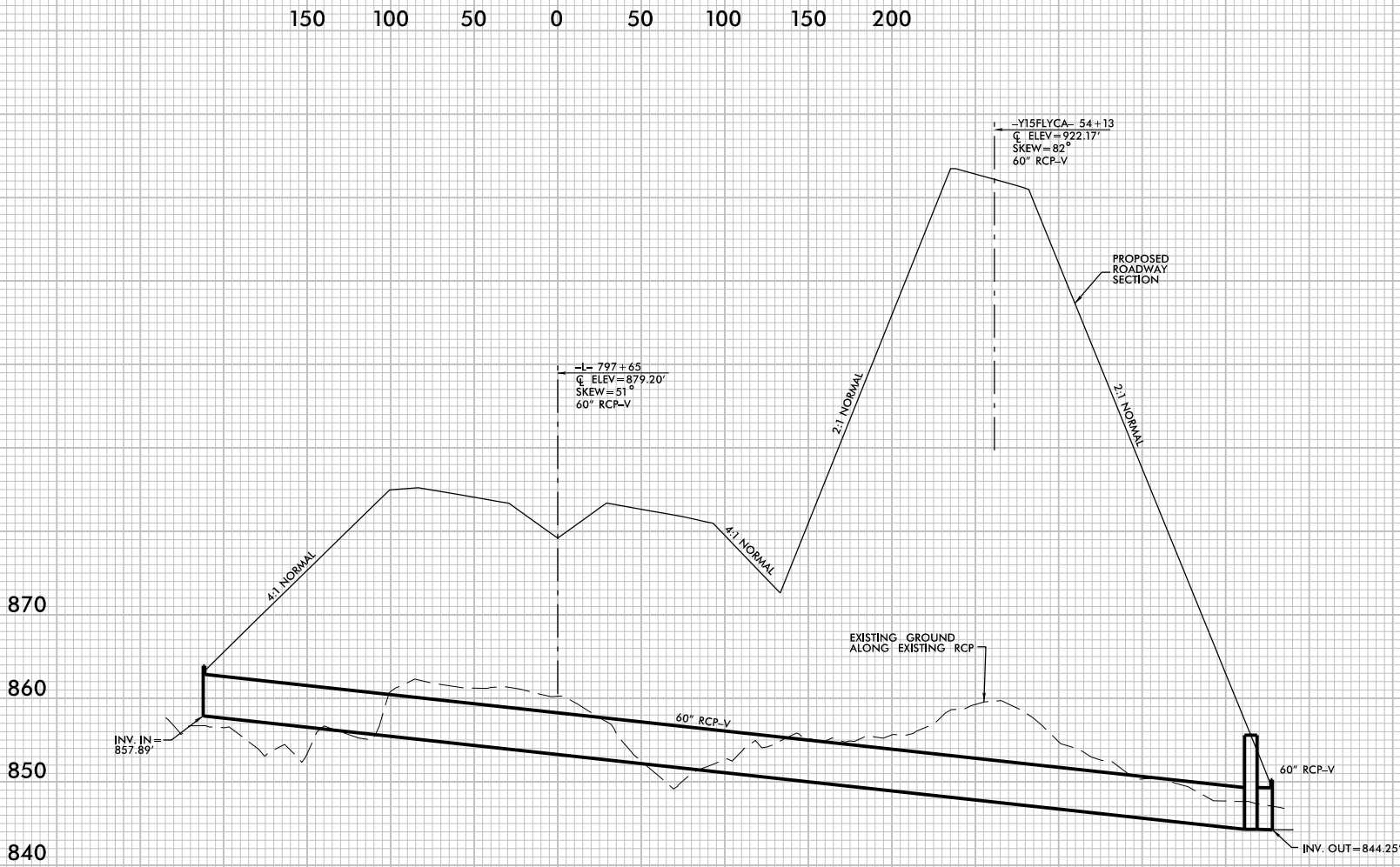


PROFILE ALONG C OF CULVERT

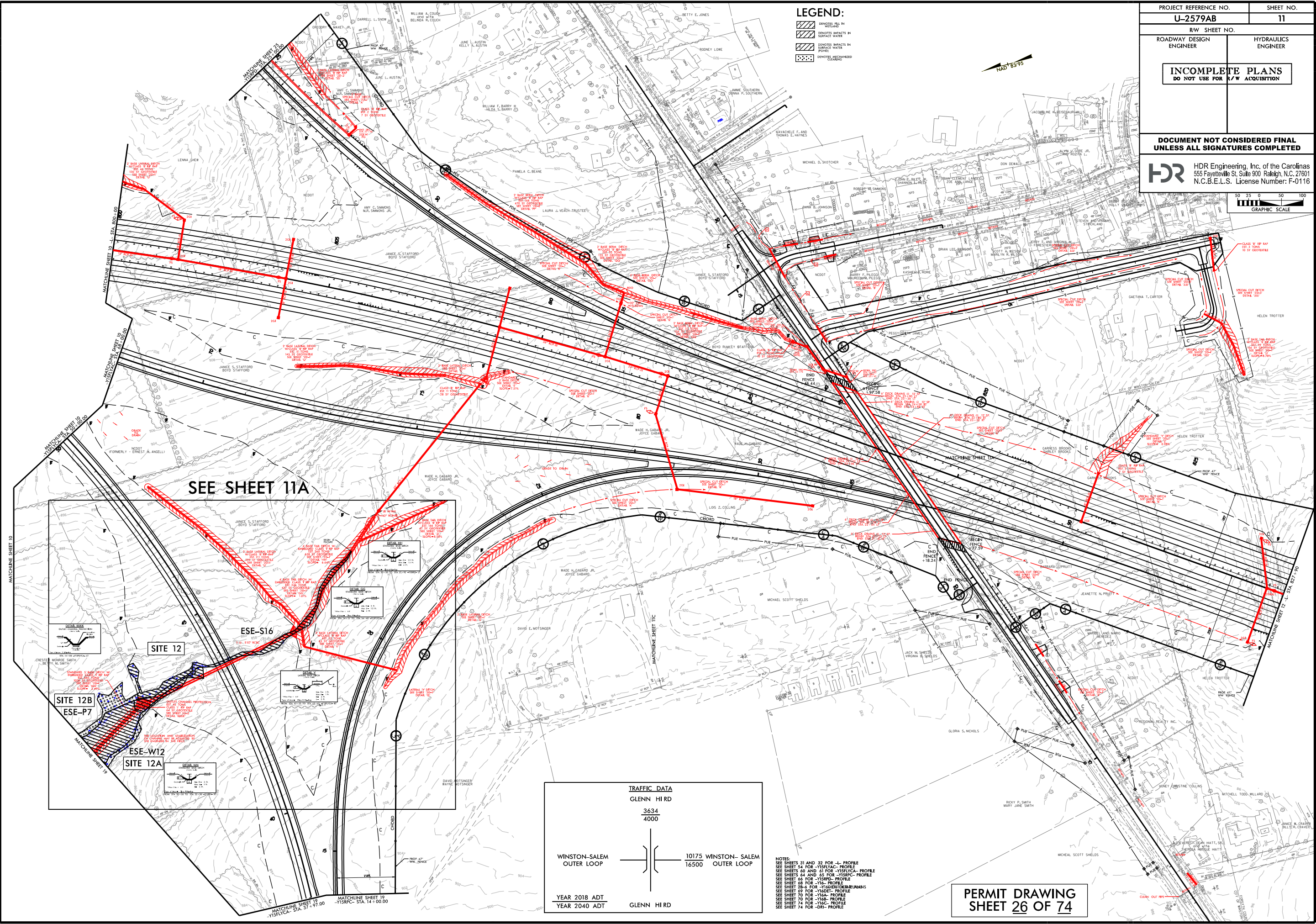
REVISIONS

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	U-2579AB		
	ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER
	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		

U-2579AB – SITE 10



PROFILE ALONG Q_c OF CULVERT



LEGEND:

- EXISTING R/W IN YELLOW
- EXISTING IMPACTS IN SURFACE WATER
- EXISTING IMPACTS IN SURFACE WATER (POND)
- EXISTING MECHANIZED CLEARING

NAD 83 95

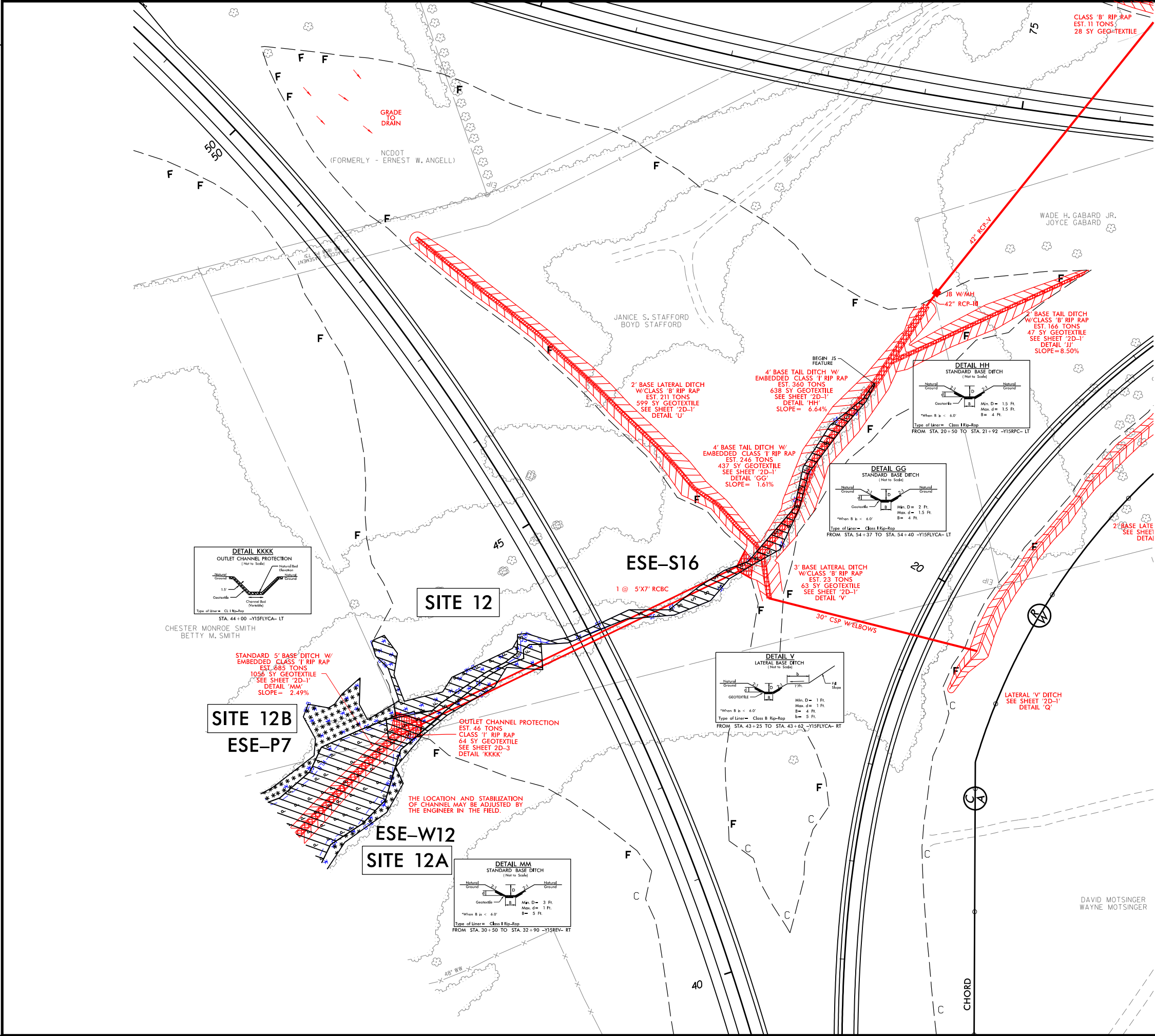
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U-2579AB		11	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
HDR HDR Engineering, Inc. of the Carolinas 555 Fayetteville St., Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116			
50 25 0 50 100 GRAPHIC SCALE			

TRAFFIC DATA	
GLENN HI RD	
3634	
4000	
WINSTON-SALEM OUTER LOOP	
YEAR 2018 ADT	10175 WINSTON-SALEM
YEAR 2040 ADT	16500 OUTER LOOP
GLENN HI RD	

NOTES:
SEE SHEETS 31 AND 32 FOR -L- PROFILE
SEE SHEET 34 FOR -YISFLYCA- PROFILE
SEE SHEETS 60 AND 61 FOR -YISFLYCA- PROFILE
SEE SHEETS 64 AND 65 FOR -YISRDC- PROFILE
SEE SHEET 66 FOR -YISRDC- PROFILE
SEE SHEET 68 FOR -YISRDC- PROFILE
SEE SHEET 70 FOR -YISRDC- PROFILE
SEE SHEET 72 FOR -YISRDC- PROFILE
SEE SHEET 74 FOR -YISRDC- PROFILE
SEE SHEET 76 FOR -YISRDC- PROFILE
SEE SHEET 78 FOR -YISRDC- PROFILE
SEE SHEET 80 FOR -YISRDC- PROFILE
SEE SHEET 82 FOR -YISRDC- PROFILE
SEE SHEET 84 FOR -YISRDC- PROFILE
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SEE SHEET 96 FOR -YISRDC- PROFILE
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SEE SHEET 100 FOR -YISRDC- PROFILE

PERMIT DRAWING
SHEET 26 OF 74

REVISIONS

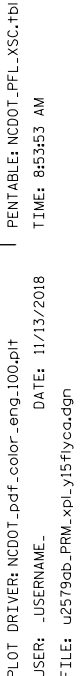


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R/W SHEET NO.	
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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
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25 12.5 0 25 50 GRAPHIC SCALE	

LEGEND:

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



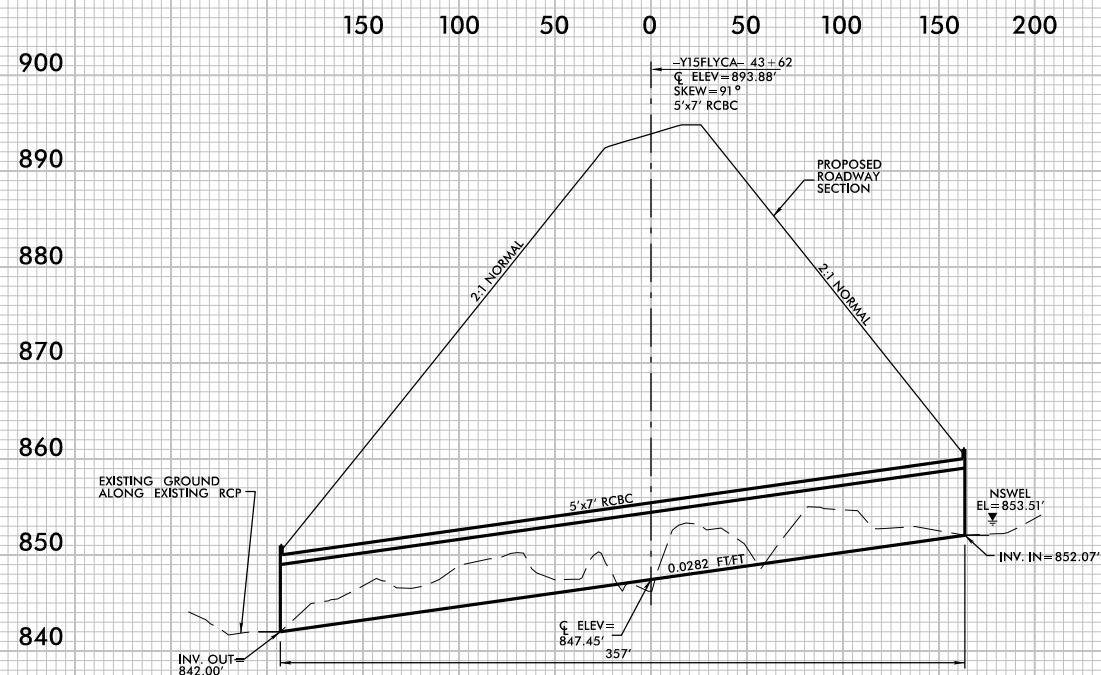


REVISIONS

5/14/99

	HDR Engineering, Inc. of the Carolinas 555 Fayetteville St, Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116	PROJECT REFERENCE NO.		SHEET NO.	
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	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED				

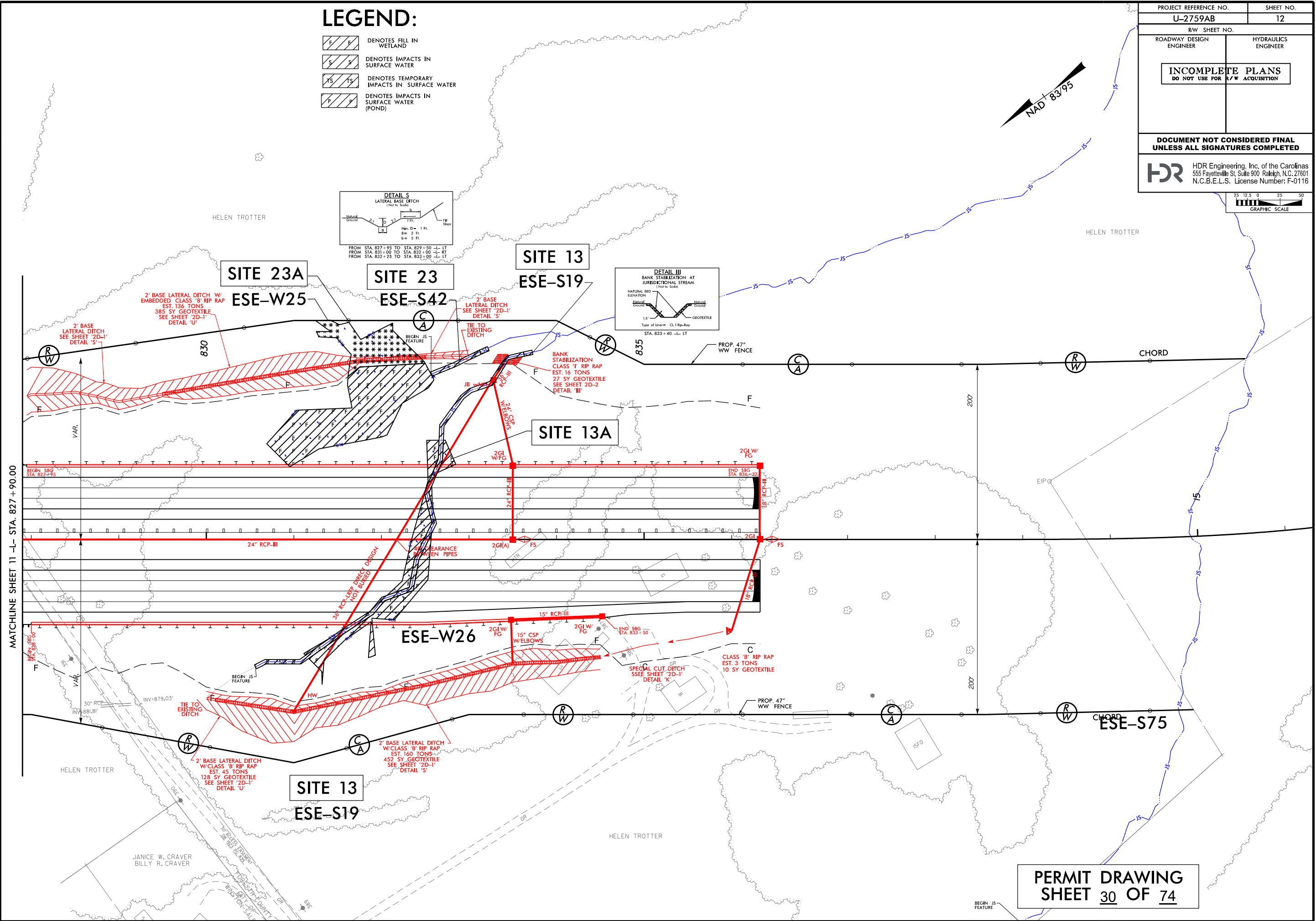
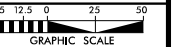
U-2579AB – SITE 12



PROFILE ALONG CL OF CULVERT

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

PROJECT REFERENCE NO.	SHEET NO.
U-2759AB	12
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	



PERMIT DRAWING
SHEET 30 OF 74

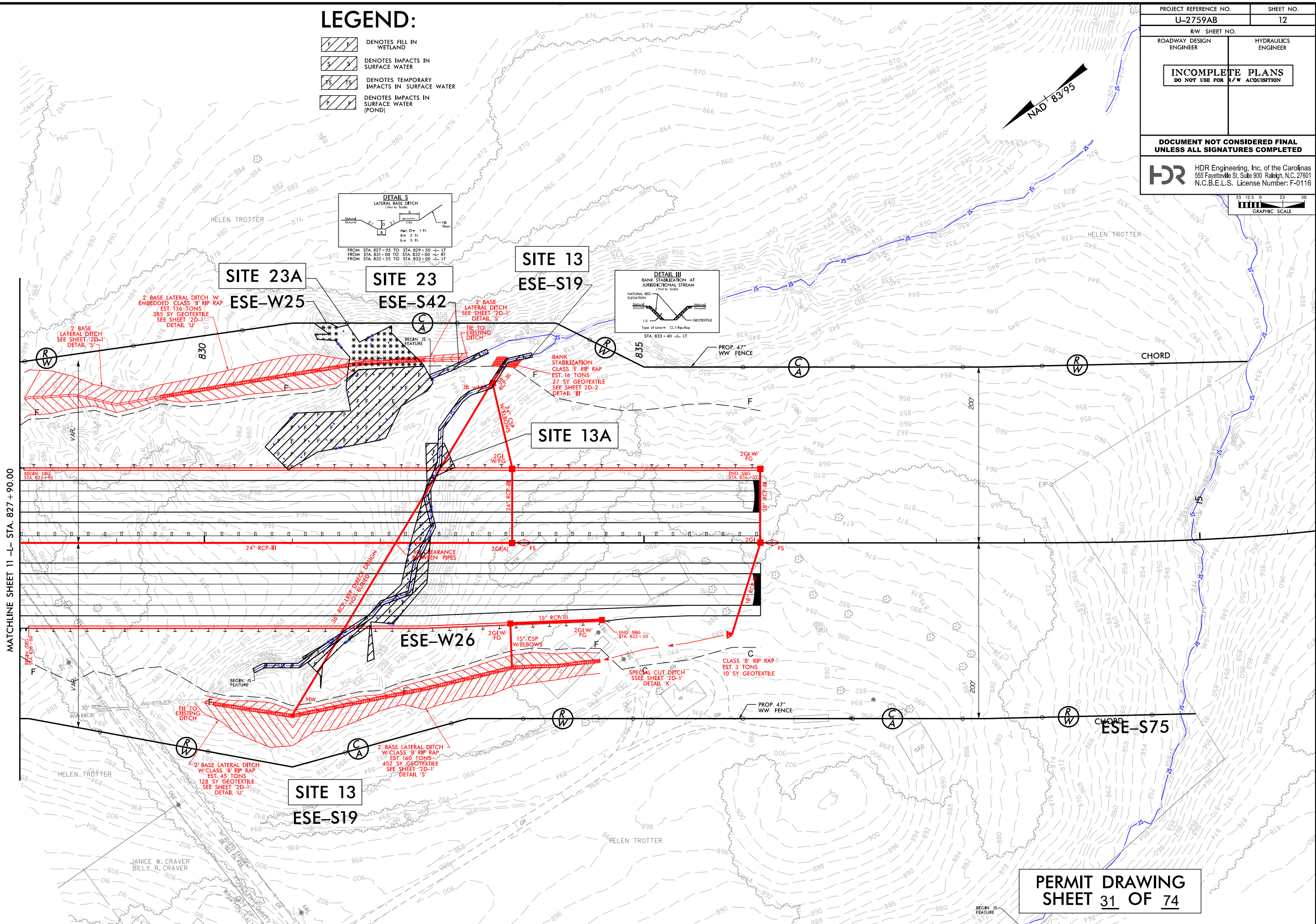
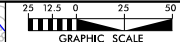
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REVISIONS

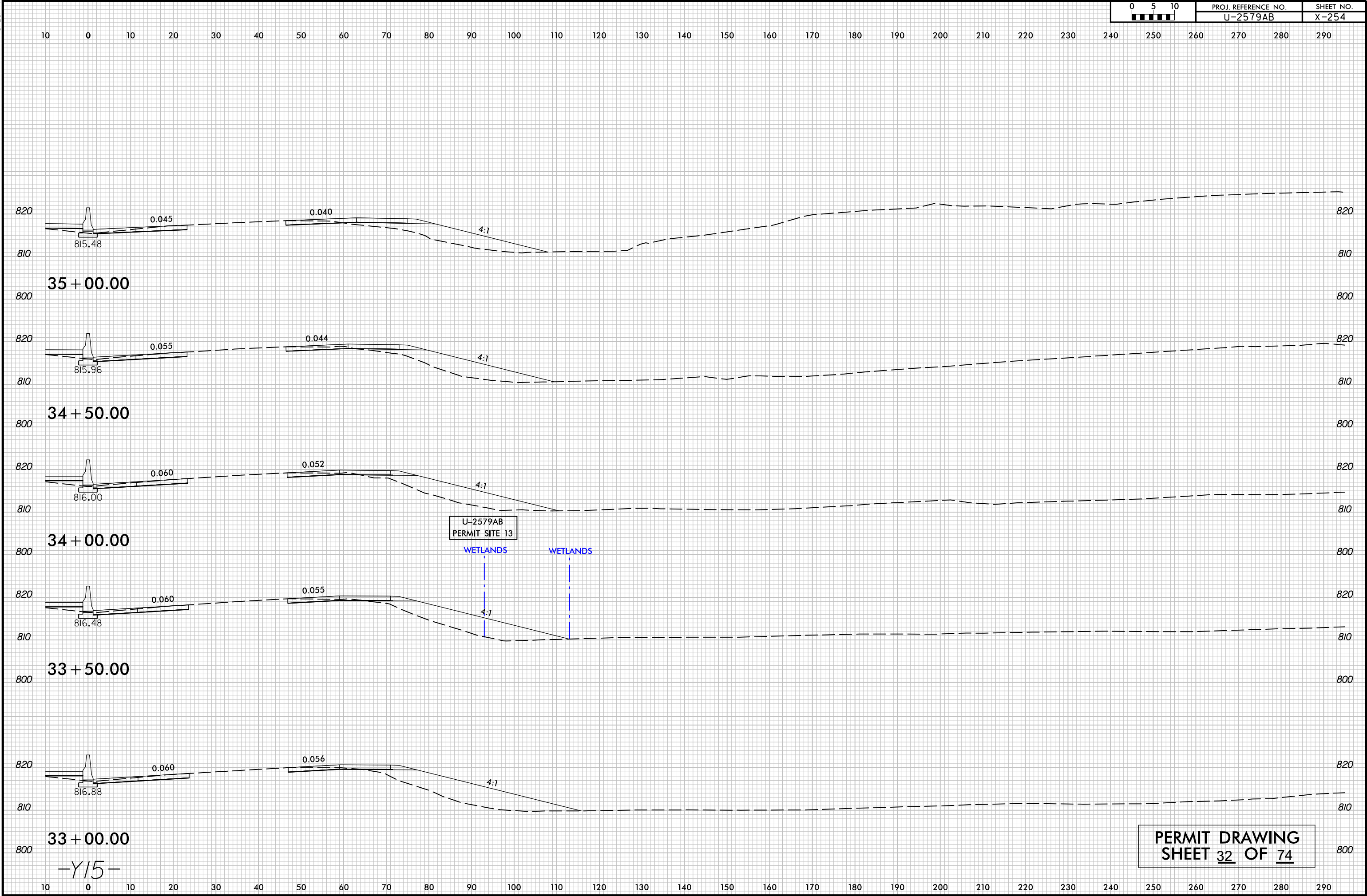
LEGEND:

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

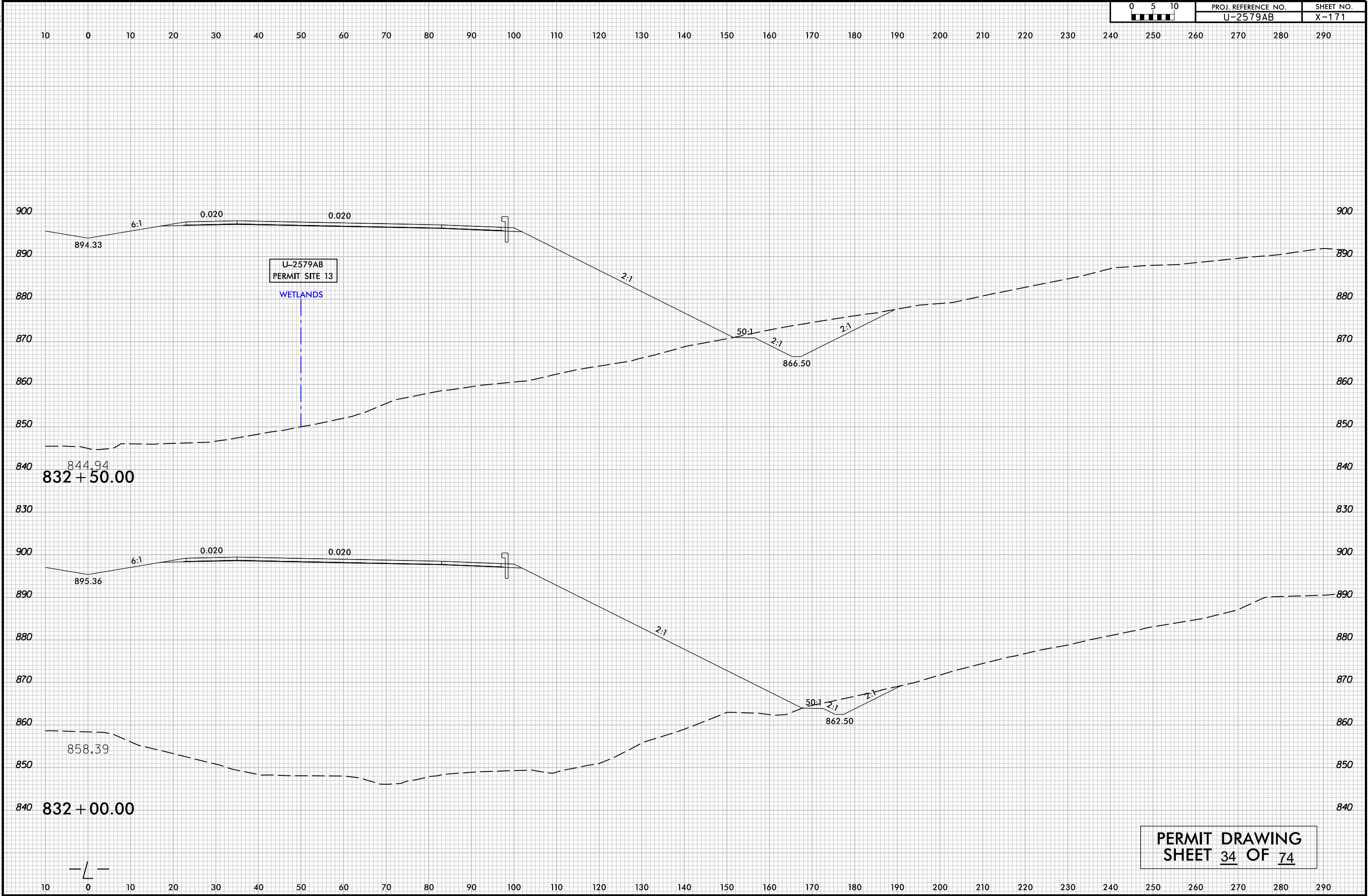
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RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
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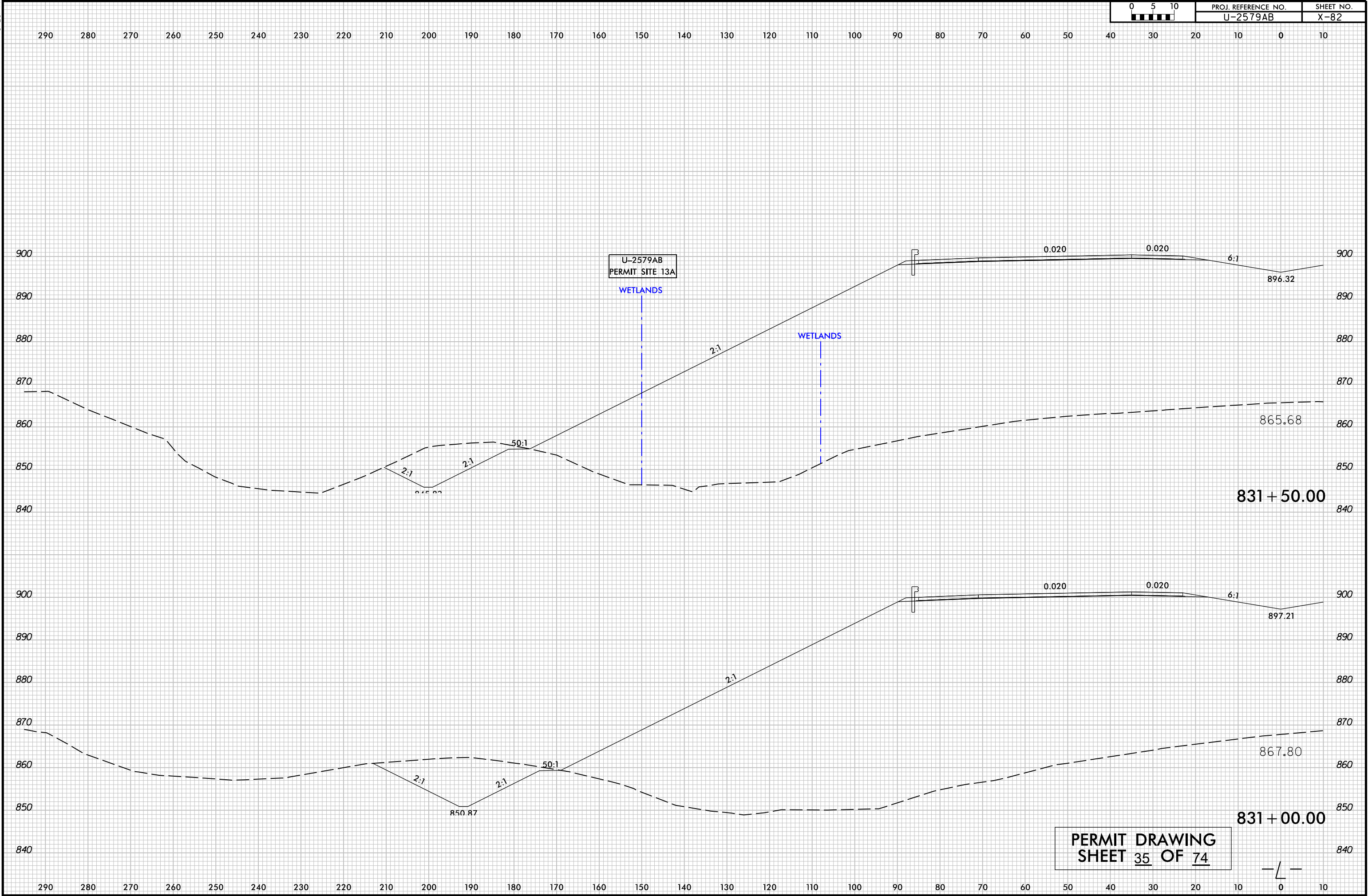


PERMIT DRAWING
SHEET 31 OF 74



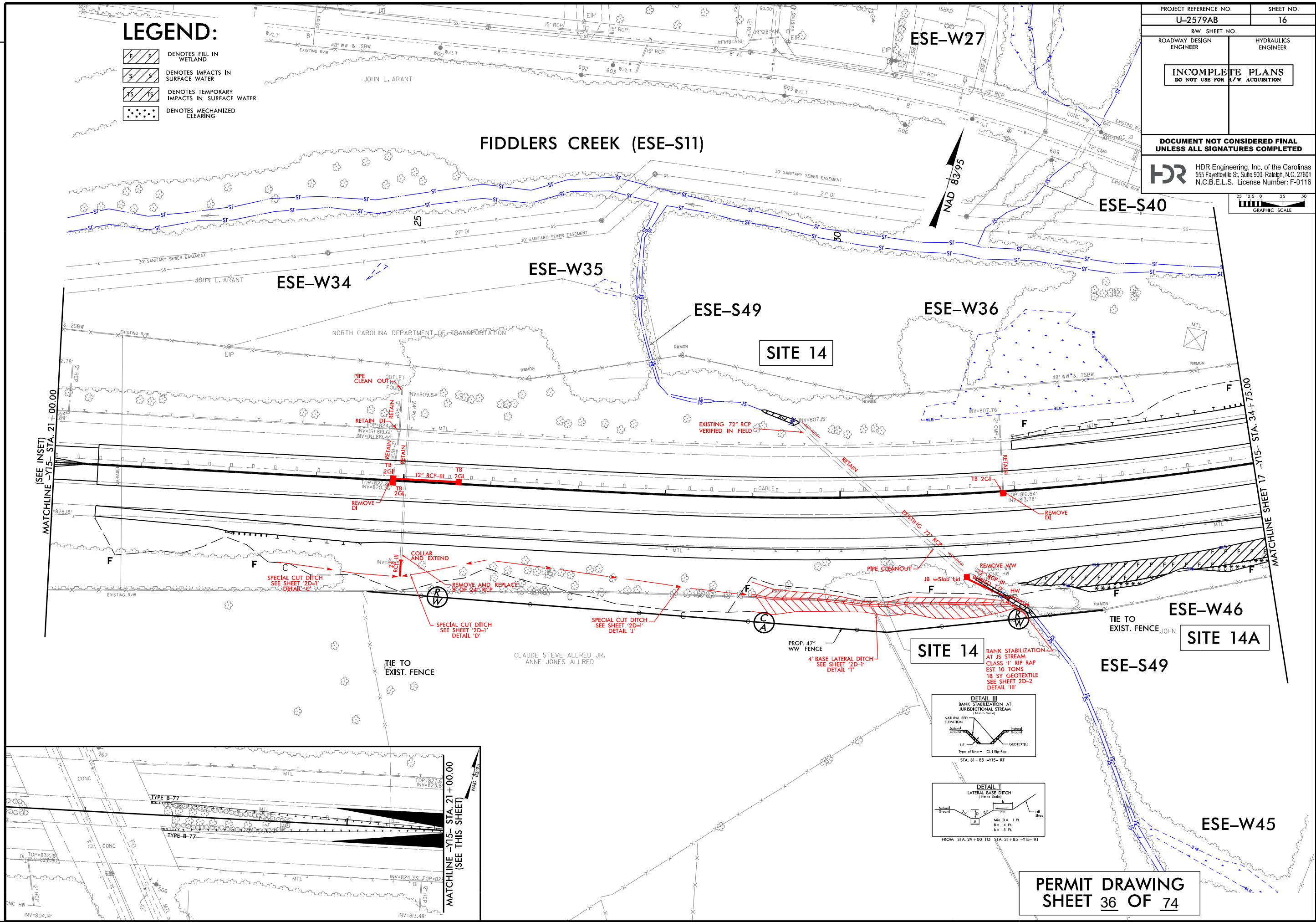




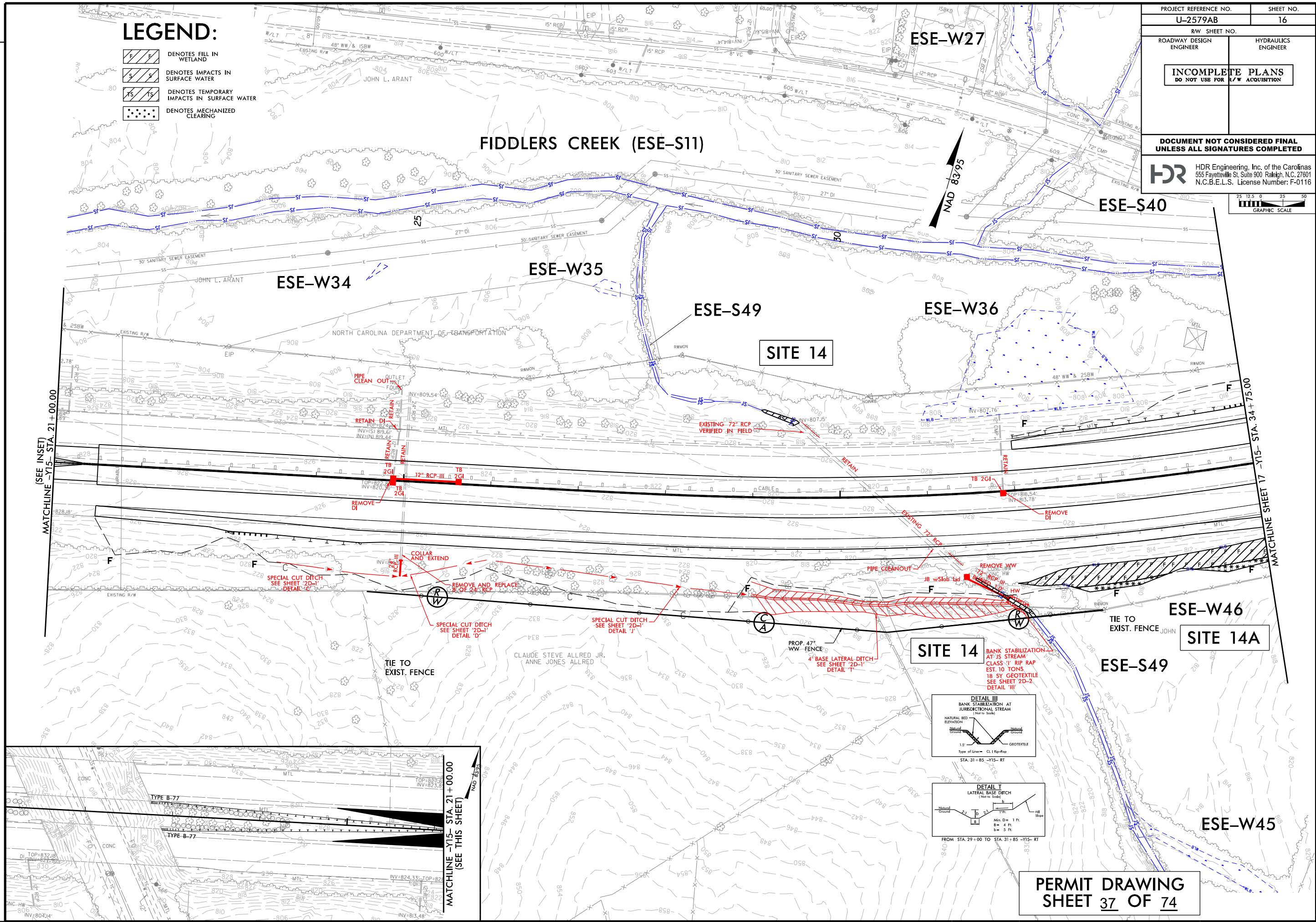
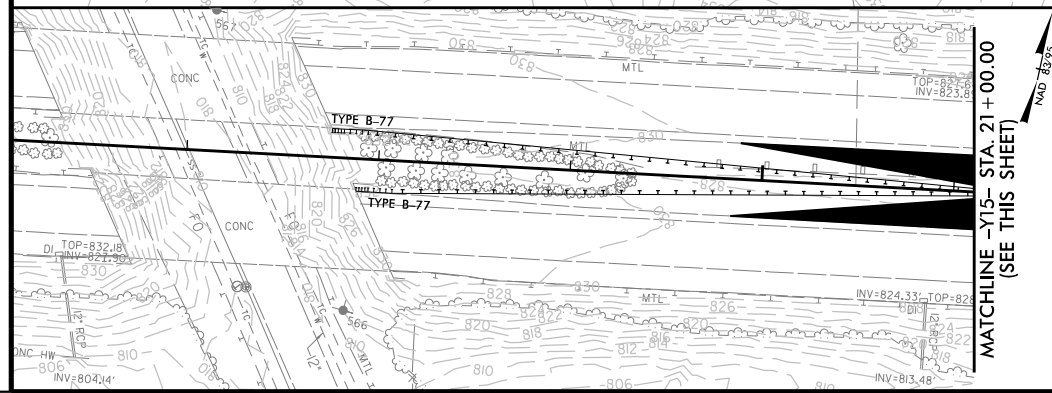


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DATE: 1/9/2019

REVISIONS



REVISIONS



LEGEND:

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

PROJECT REFERENCE NO. U-2579AB		SHEET NO. 16	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
 HDR Engineering, Inc. of the Carolinas 555 Fayetteville St., Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116			
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REVISIONS

5/14/99

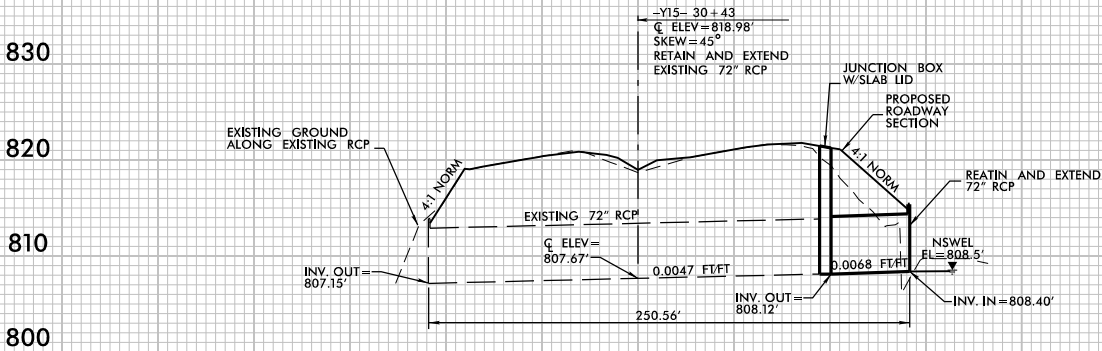


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N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.		SHEET NO.
U-2579AB		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		

U-2579AB – SITE 14

150 100 50 0 50 100 150



PROFILE ALONG C OF PIPE

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

ESE-W28

ESE-S43

SITE 27

ESE-S51

CLASS 'B' RIP RAP
EST. 11 TONS
28 SY GEOTEXTILE

ESE-S53 ✓

PROJECT REFERENCE NO.	SHEET NO.
U-2579AB	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	

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

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555 Fayetteville St., Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

GRAPHIC SCALE

SITE 14A

PERMIT DRAWING
SHEET 39 OF 74

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REVISIONS

MATCHLINE SHEET 16 -Y15- STA. 34 + 75.00

MATCHLINE SHEET 18 - Y15- STA. 48 + 50.00

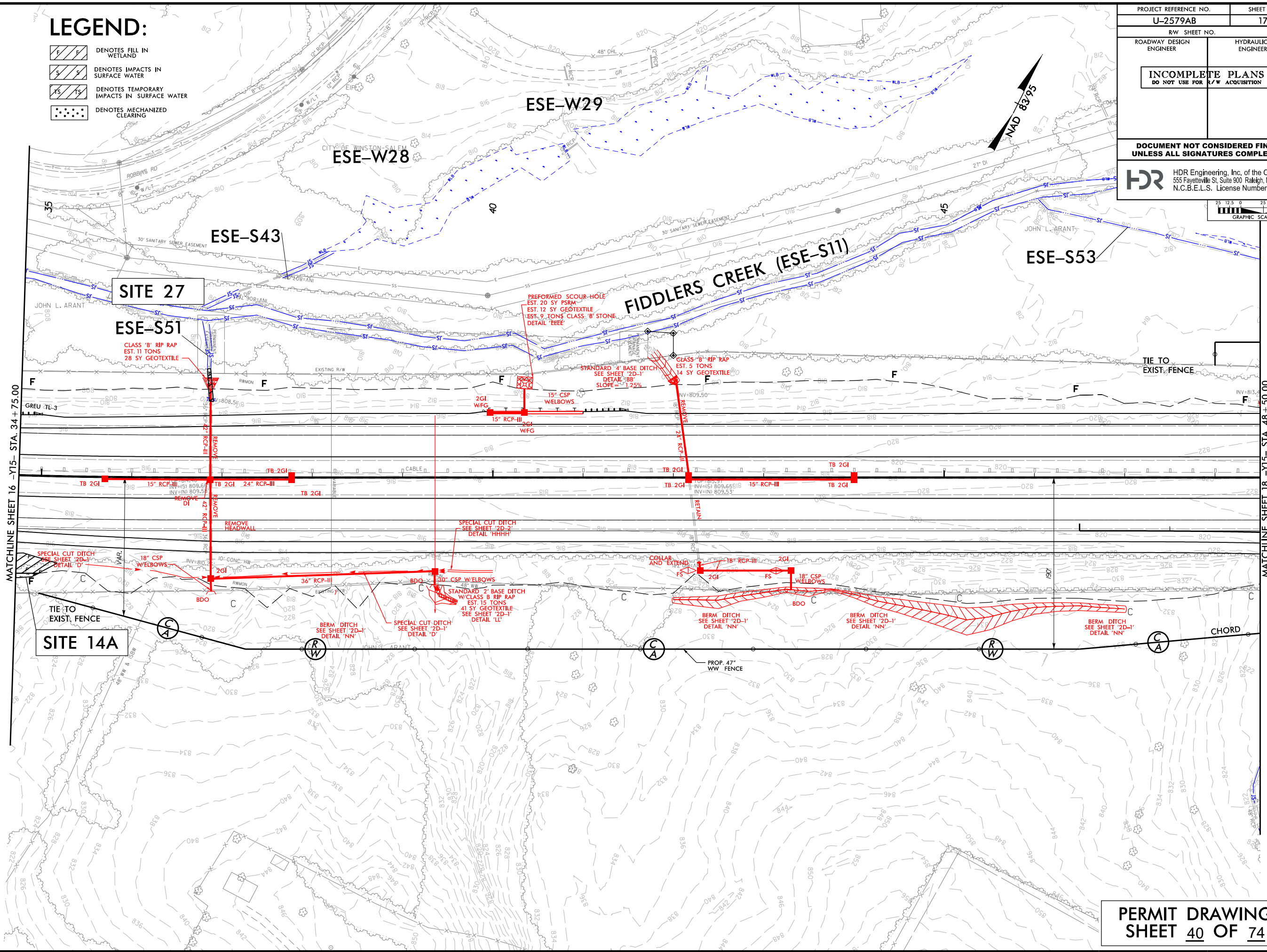
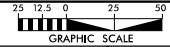
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REVISIONS

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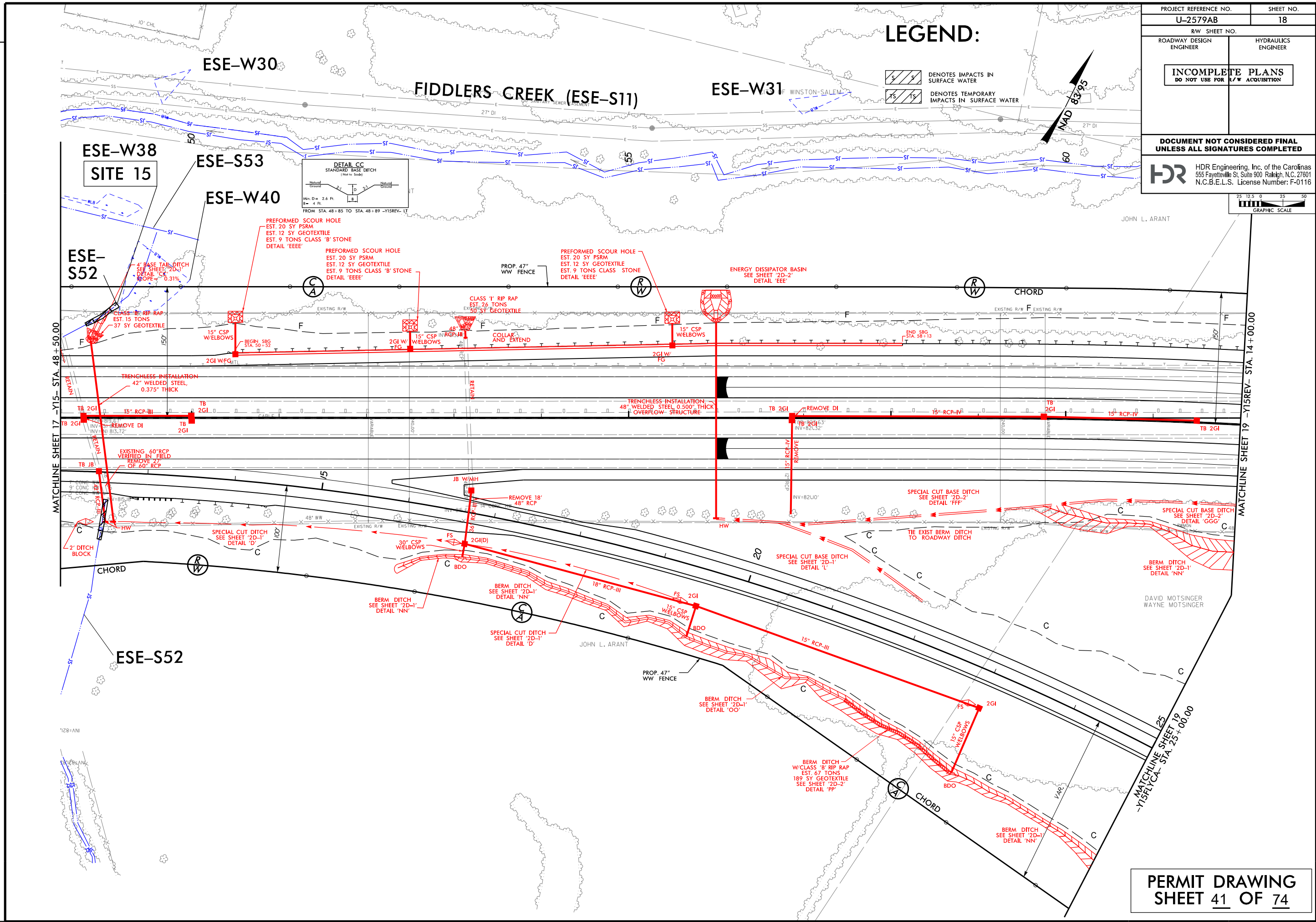
- DENOTES FILL IN WETLAND
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES MECHANIZED CLEARING

PROJECT REFERENCE NO.		SHEET NO.	
U-2579AB		17	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
HDR Engineering, Inc. of the Carolinas 555 Fayetteville St, Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116			



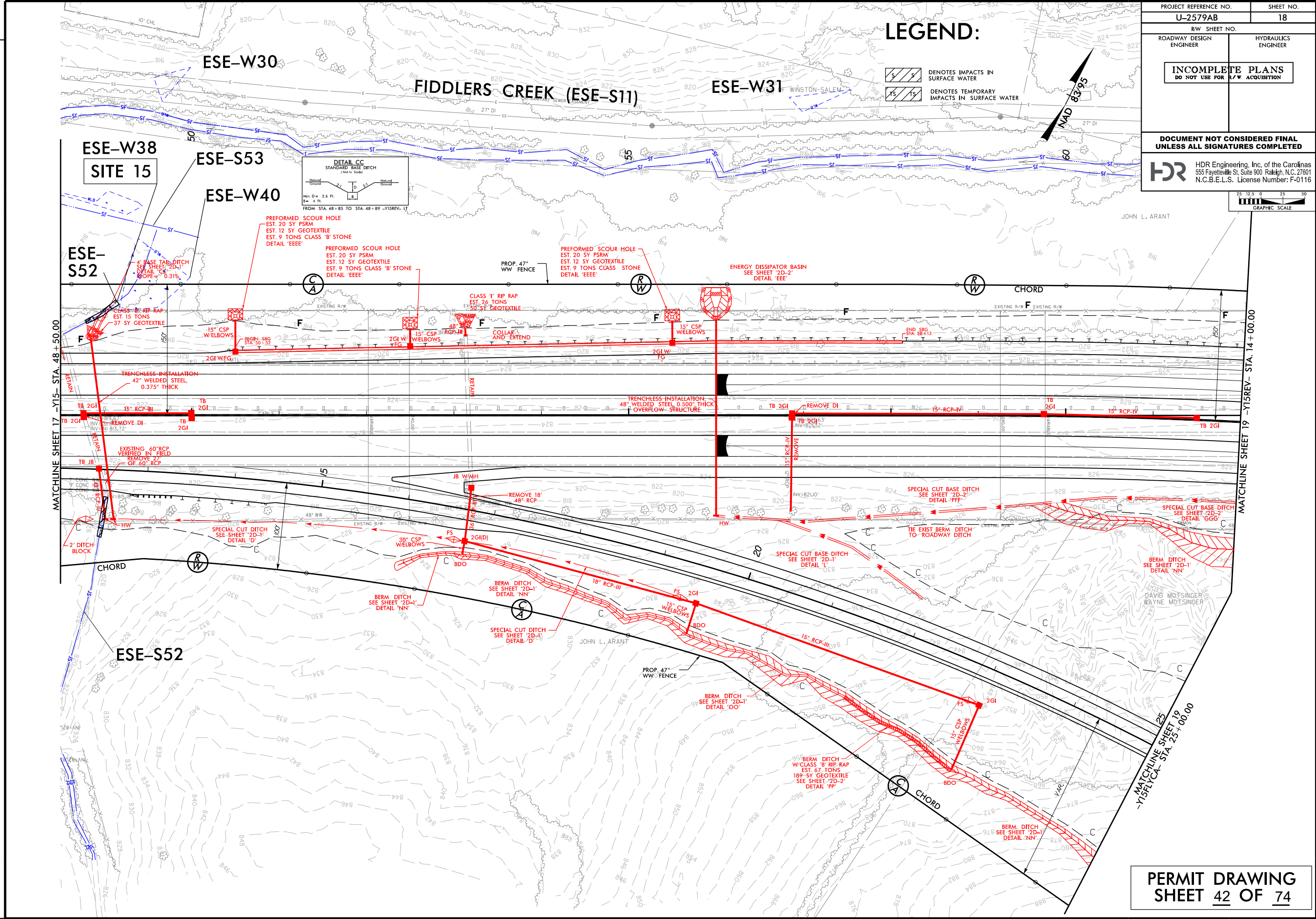
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REVISIONS



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REVISIONS

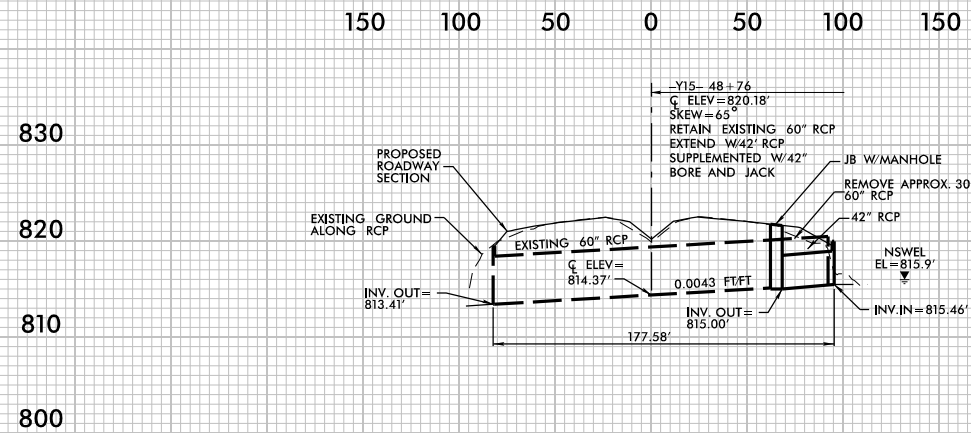


REVISIONS

5/14/99

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	U-2579AB		
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	
	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		

U-2579AB – SITE 15



PROFILE ALONG G OF PIPE

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N.C.B.E.L.S. License Number: F-0116

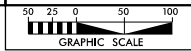
U-2579AB

19

ROADWAY DESIGN
ENGINEER

**HYDRAULICS
ENGINEER**

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION




 DENOTES FILL IN WETLAND
 DENOTES IMPACTS IN SURFACE WATER
 DENOTES TEMPORARY IMPACTS IN SURFACE WATER
 DENOTES IMPACTS IN SURFACE WATER (FOND)
 DENOTES MECHANIZED CLEARING

SEE SHEET 19A

SEE SHEET 19B

SEE SHEET 19C

PERMIT DRAWING
SHEET 44 OF 74

PLOT DRIVER: NC00T_pcf_color_eng.100.plt
 USER: CMYCS DATE: 1/9/2019
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REVISIONS

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DATE: 1/9/2019 TIME: 7:02:29 AM

REVISIONS

- LEGEND:
- DENOTES FILL IN WETLAND
 - DENOTES IMPACTS IN SURFACE WATER
 - DENOTES TEMPORARY IMPACTS IN SURFACE WATER
 - DENOTES IMPACTS IN SURFACE WATER
 - DENOTES MECHANIZED CLEARING

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



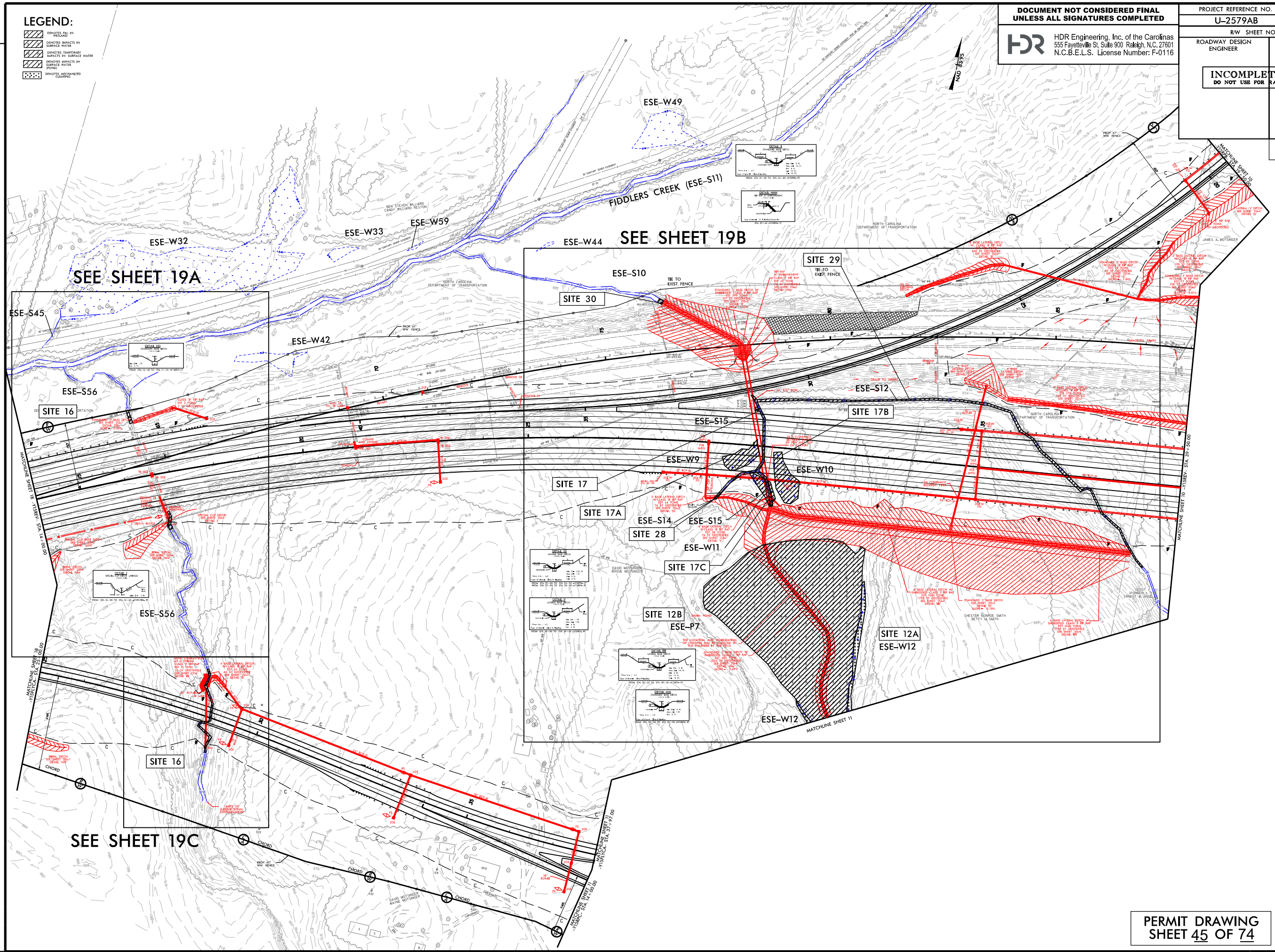
HDR Engineering, Inc. of the Carolinas
555 Fayetteville St, Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO. U-2579AB		SHEET NO. 19
RW SHEET NO.		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	

INCOMPLETE PLANS
DO NOT USE FOR
R/W ACQUISITION

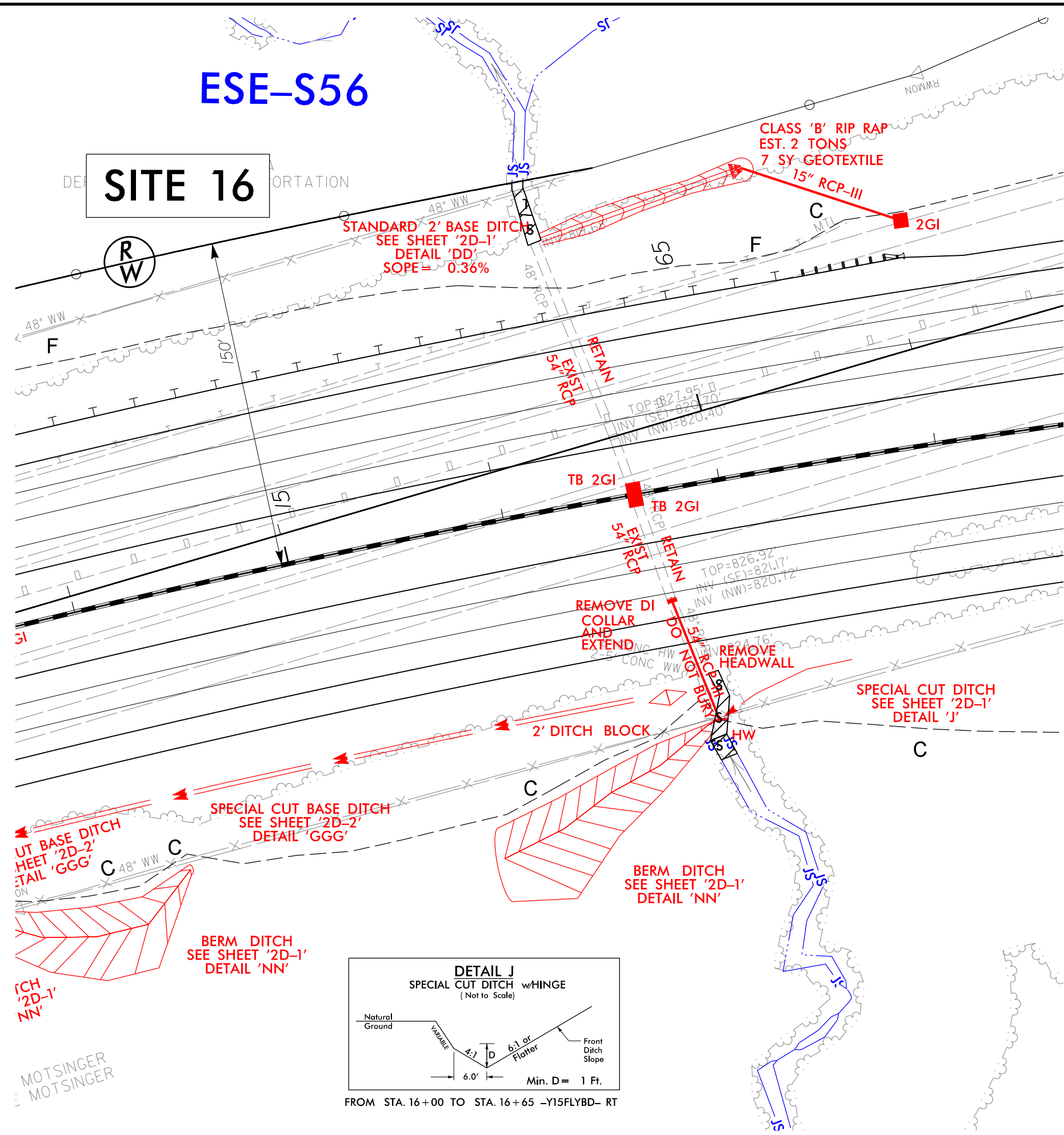


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GRAPHIC SCALE



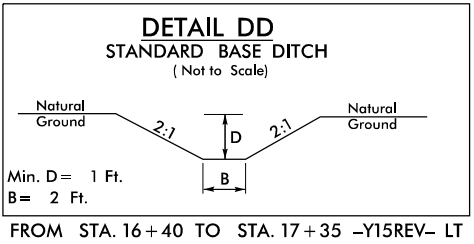
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REVISIONS

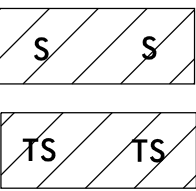


ESE-S56

SITE 16

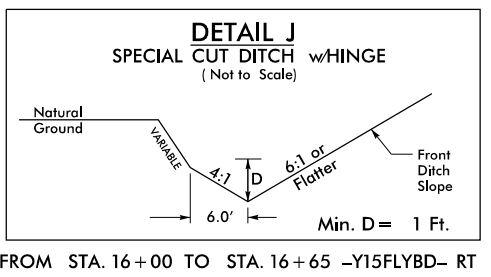


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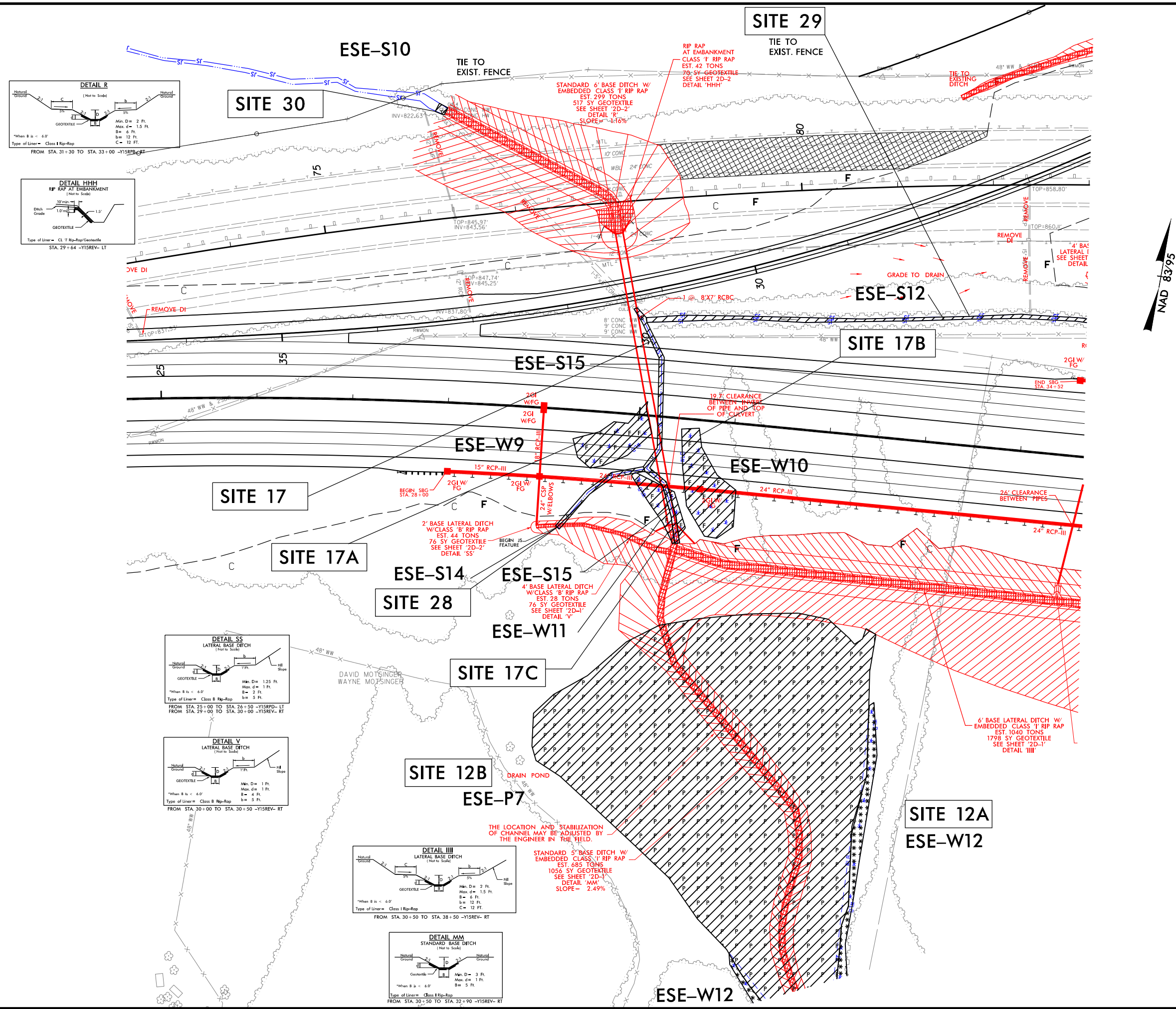


DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER



REVISIONS

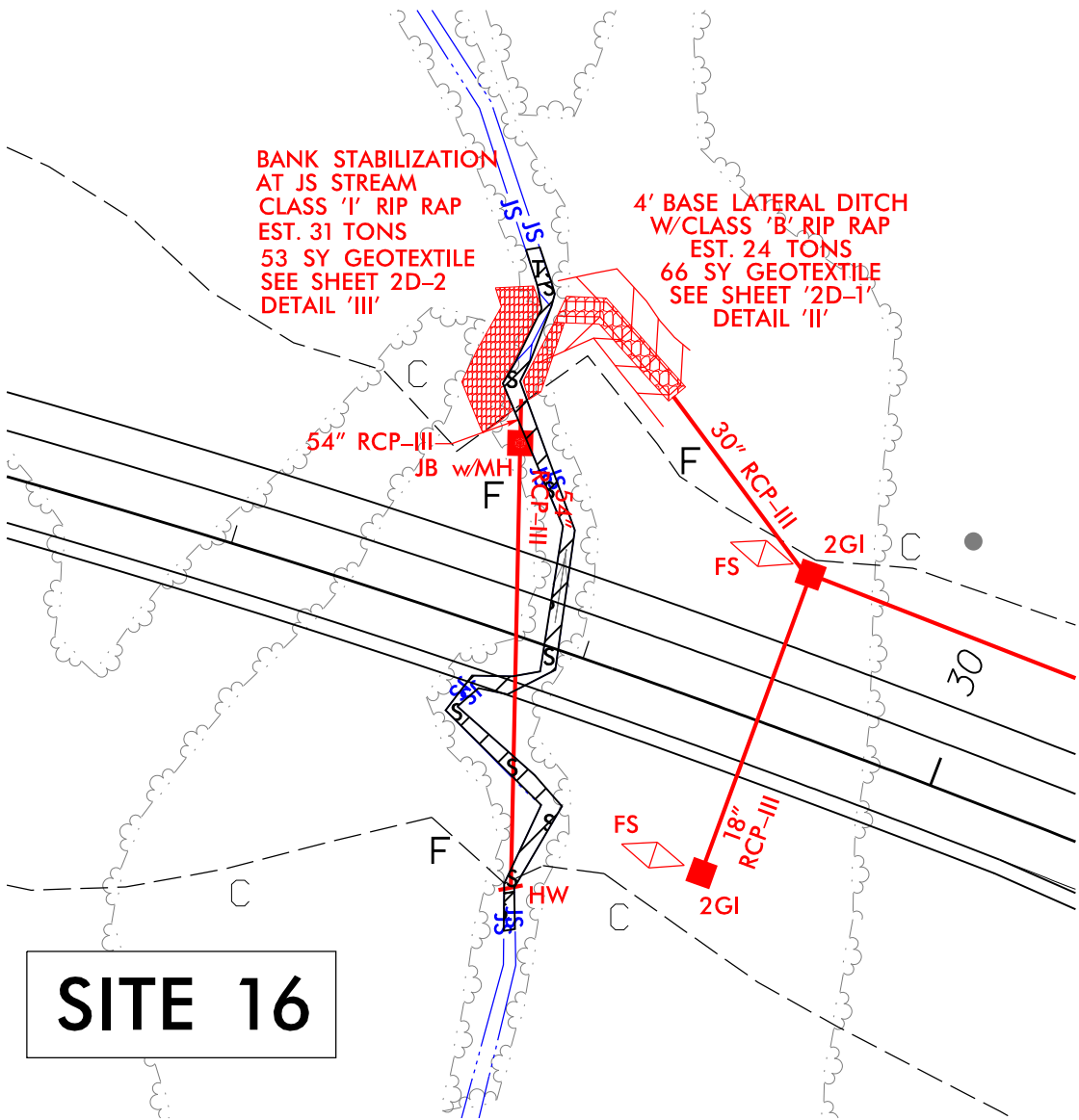


PROJECT REFERENCE NO.		SHEET NO.	
U-2579AB		19B	
RW SHEET NO.			
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
HDR Engineering, Inc. of the Carolinas 555 Fayetteville St, Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116			
GRAPHIC SCALE			

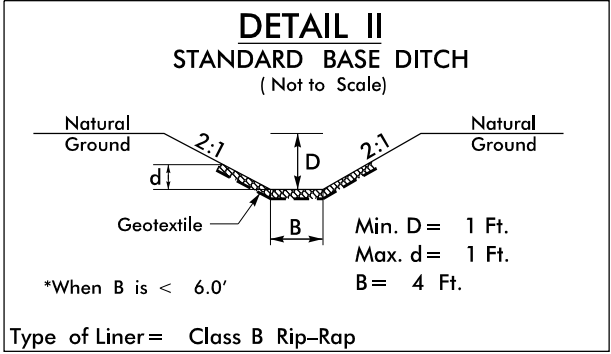
LEGEND:

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

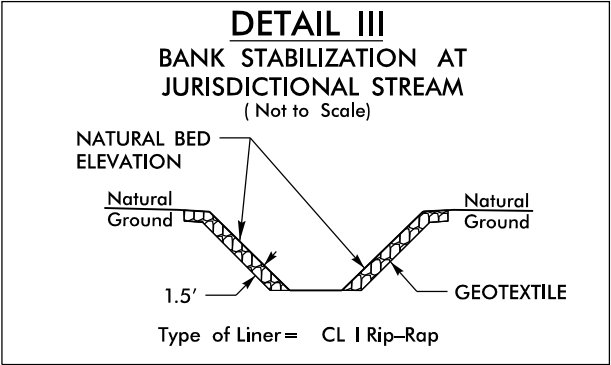
REVISIONS



SITE 16

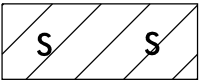


Type of Liner = Class B Rip-Rap
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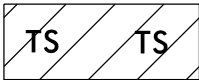


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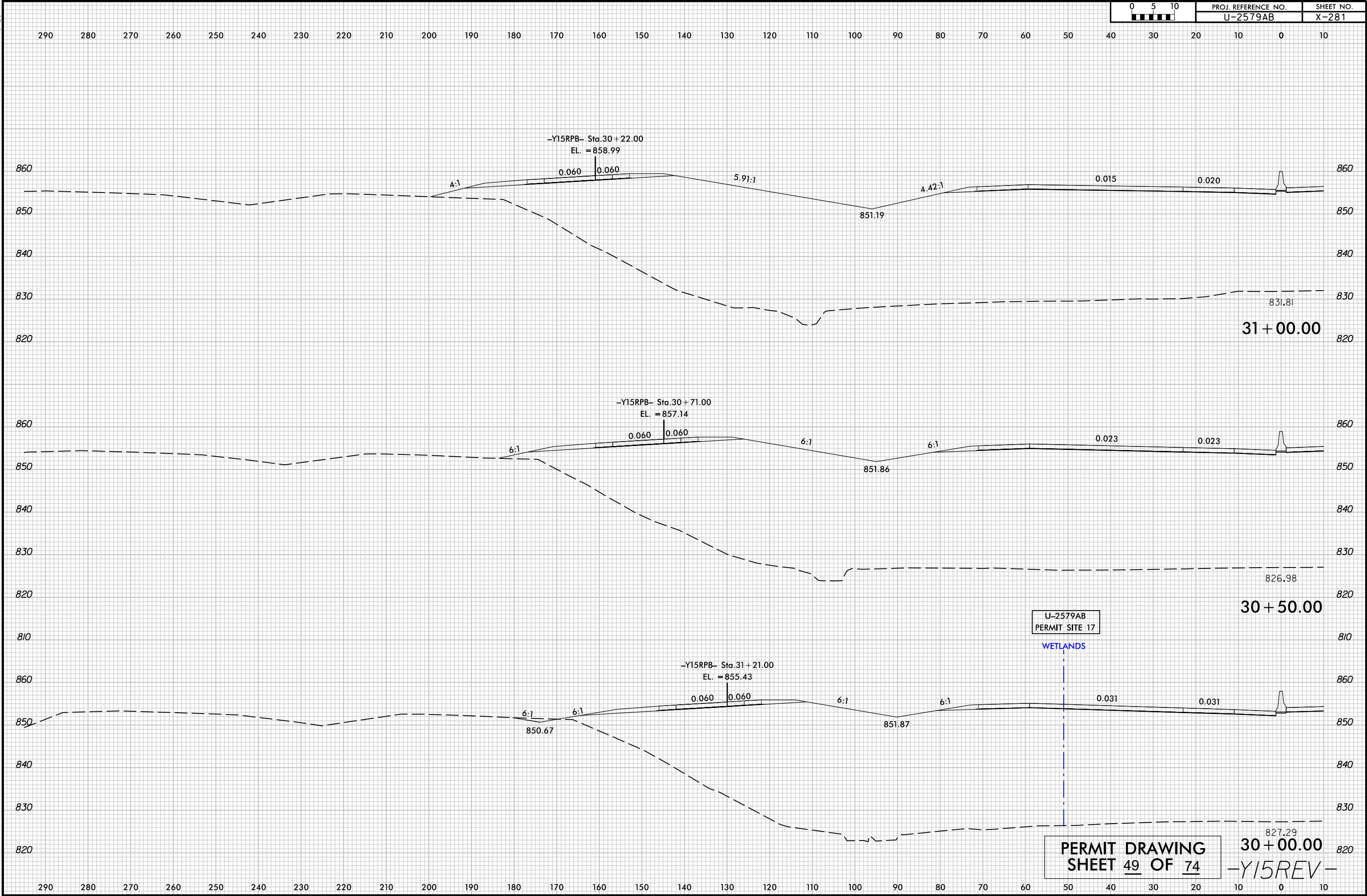


DENOTES IMPACTS IN SURFACE WATER



DENOTES TEMPORARY IMPACTS IN SURFACE WATER

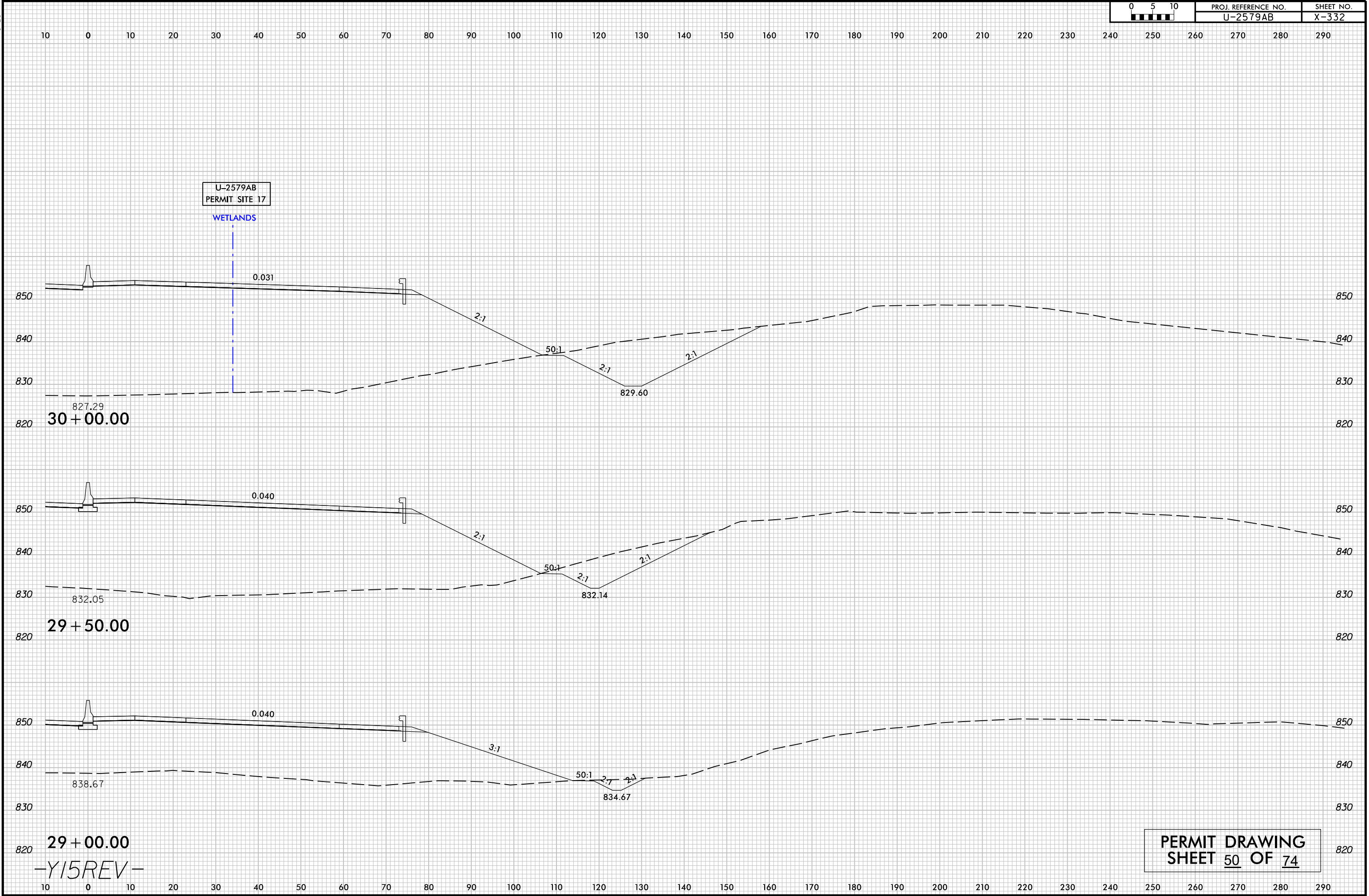
8/23/99



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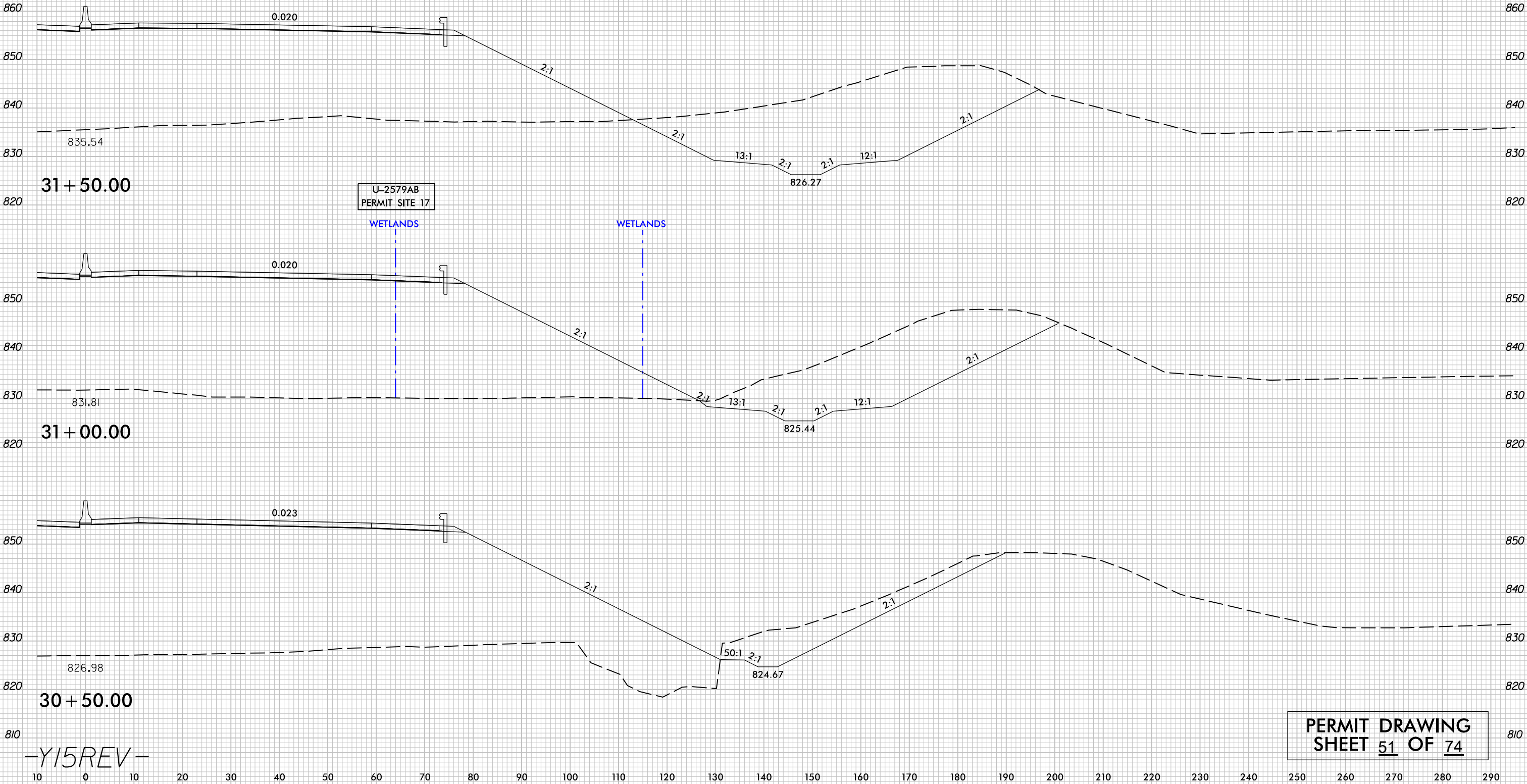
8/23/99

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8/23/99

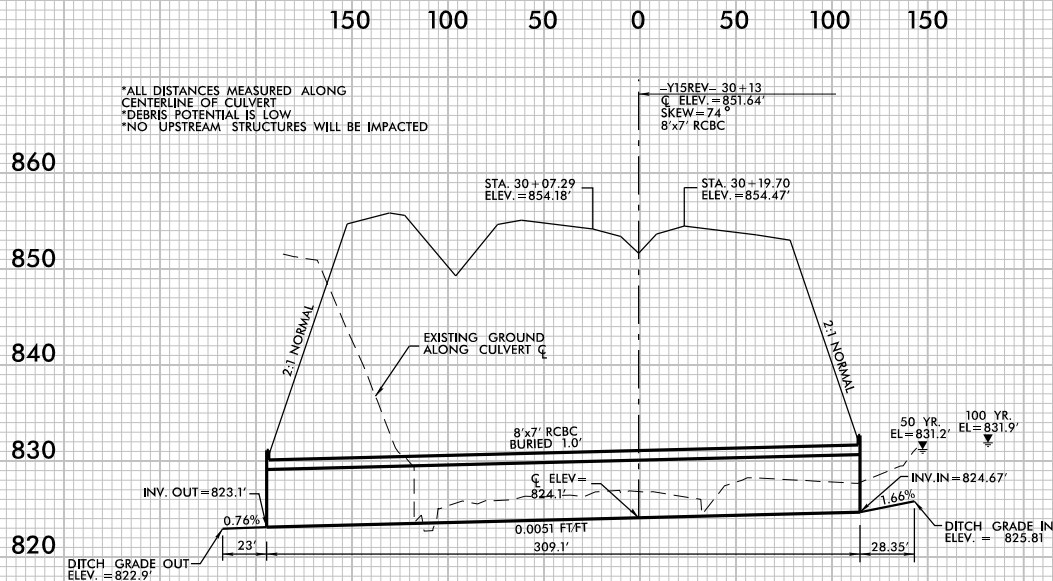
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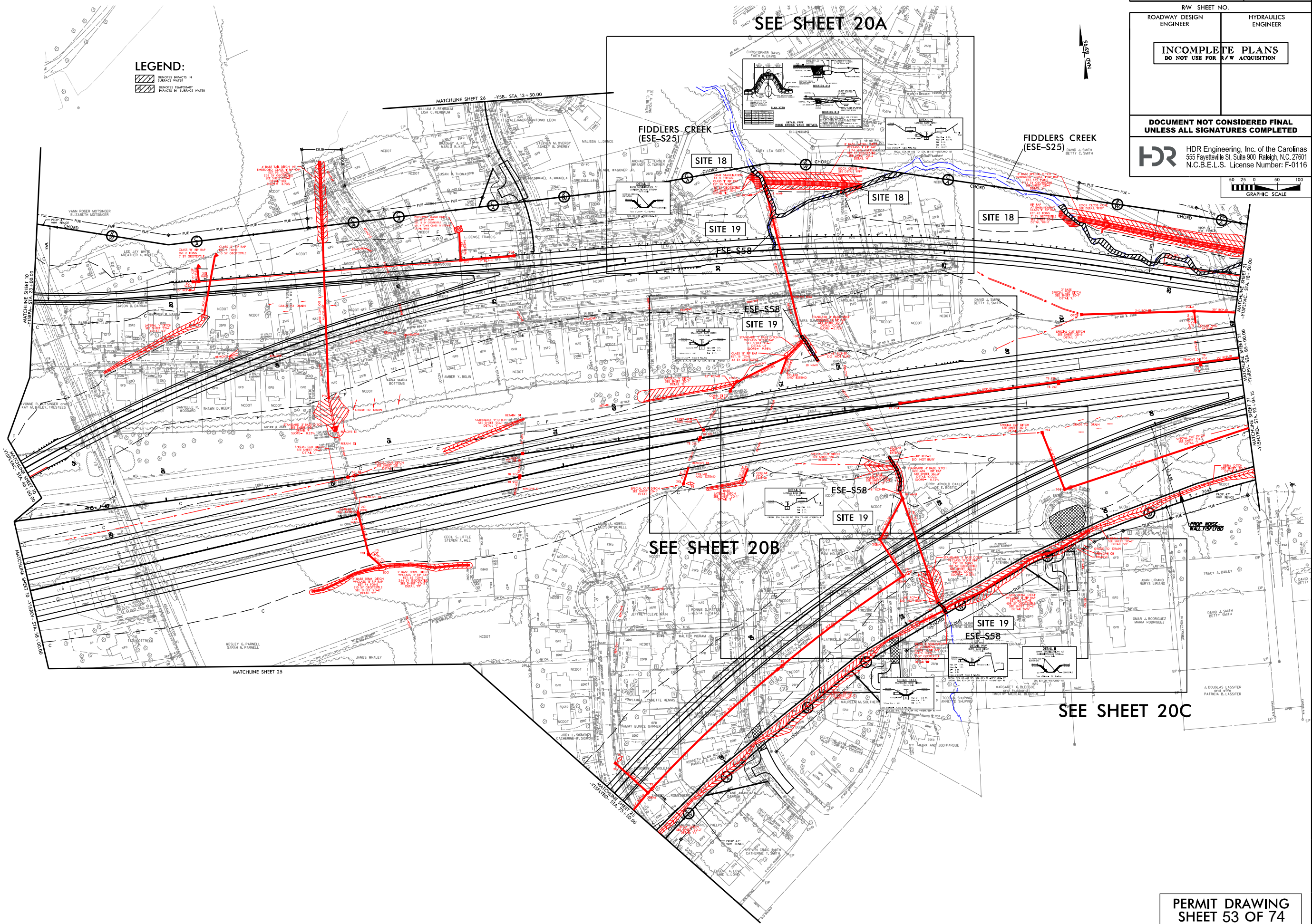
PROJECT REFERENCE NO.		SHEET NO.
U-2579AB		
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	

U-2579AB – SITE 30



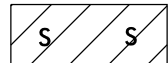
PROFILE ALONG C OF CULVERT

REVISIONS



PROJECT REFERENCE NO. U-2579AB		SHEET NO. 20	
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INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
HDR HDR Engineering, Inc. of the Carolinas 555 Fayetteville St, Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116			
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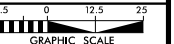


DENOTES IMPACTS IN
SURFACE WATER



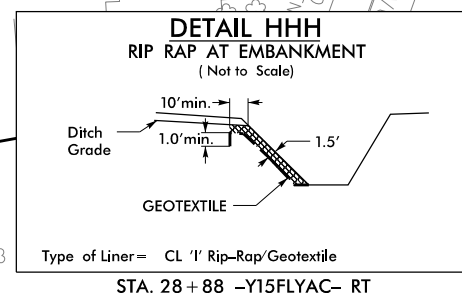
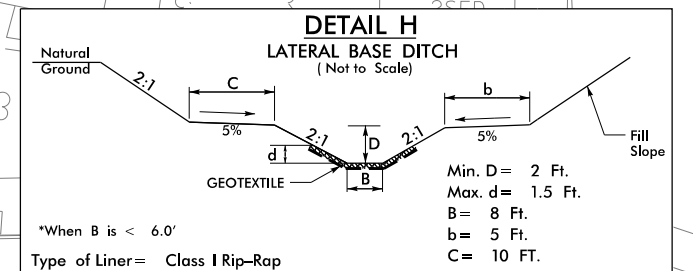
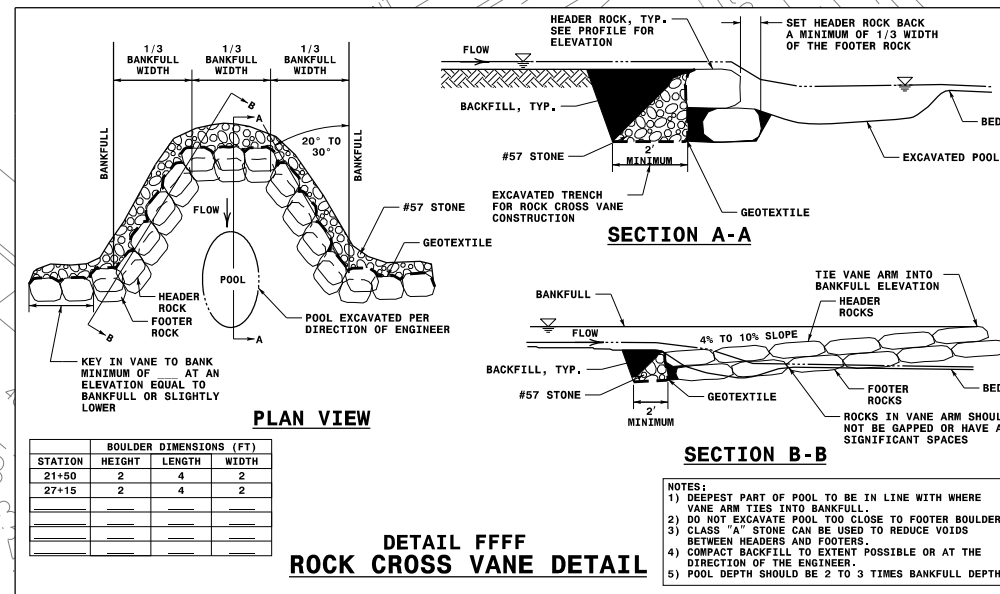
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IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
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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	
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NAD 83/95

FIDDLERS CREEK (ESE-S25)



SITE 18

RIP RAP
AT EMBANKMENT
CLASS 'I' RIP RAP
EST. 50 TONS
75 SY GEOTEXTILE
SEE SHEET 2D-2
DETAIL 'HHH'

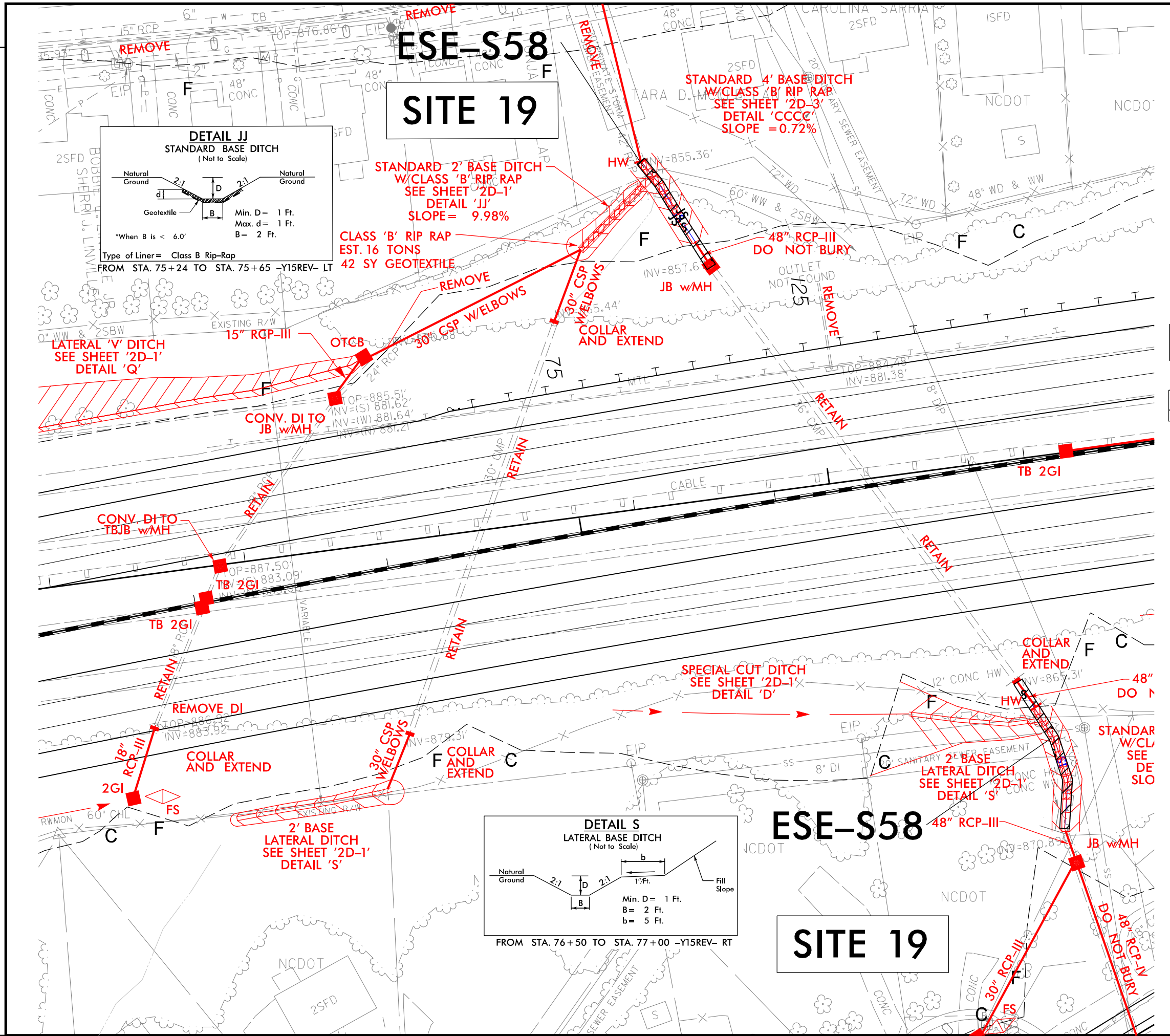
SITE 19

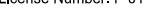
ESE-S58

SITE 18

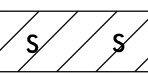
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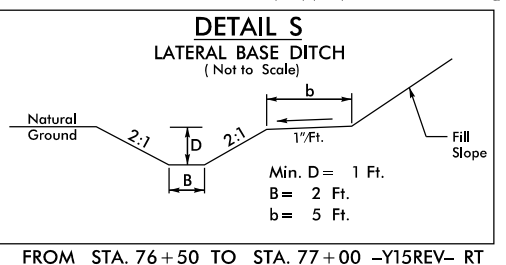
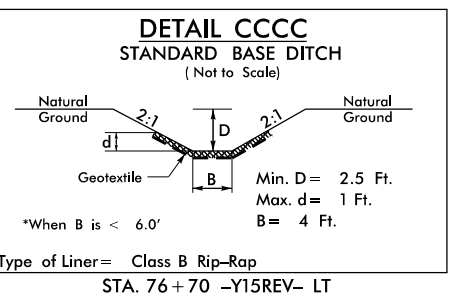
REVISIONS



PROJECT REFERENCE NO.		SHEET NO.	
U-2579AB		20B	
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INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
 HDR Engineering, Inc. of the Carolinas 555 Fayetteville St. Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116			
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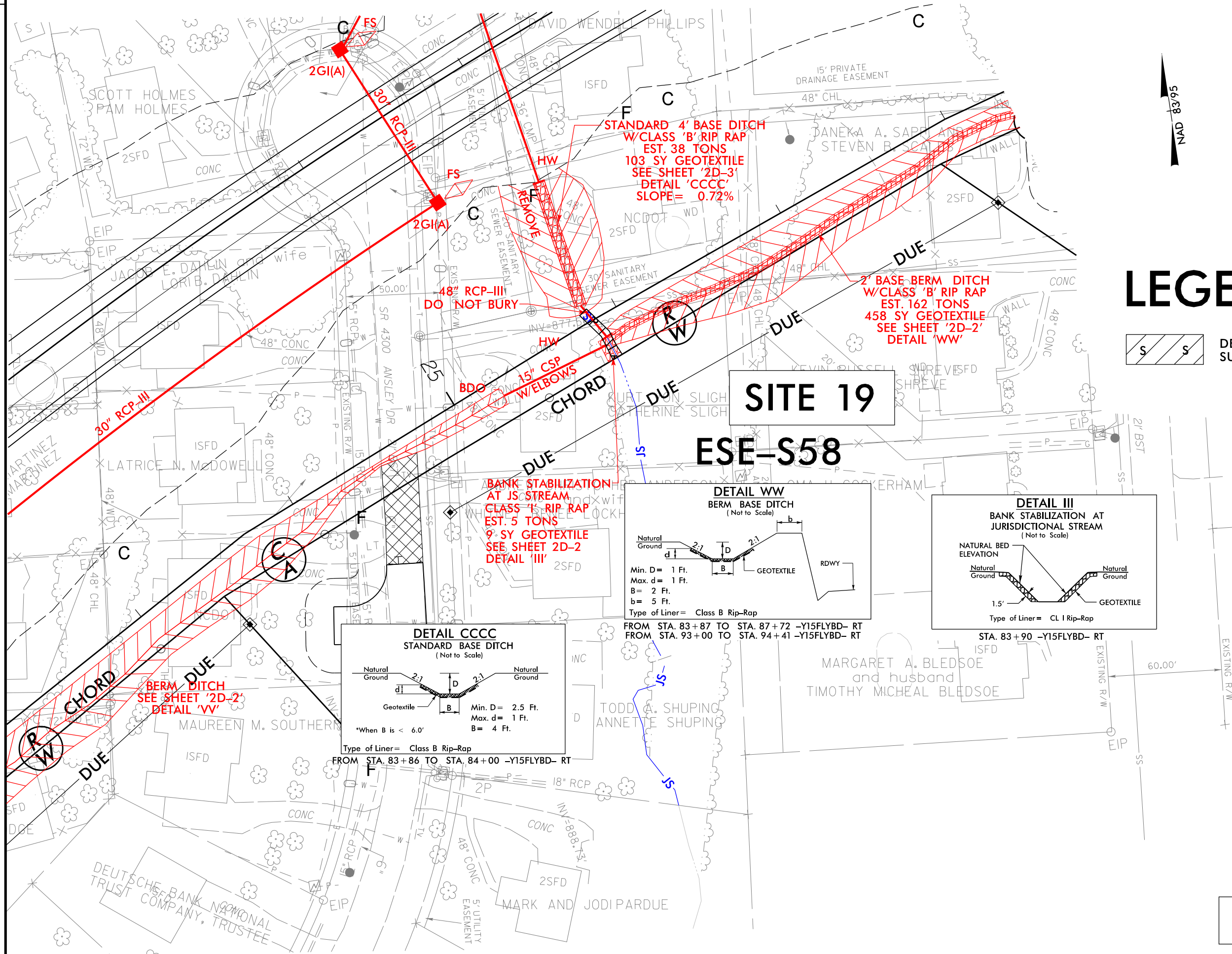
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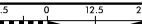
 DENOTES IMPACTS IN SURFACE WATER



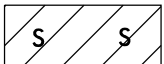
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REVISIONS

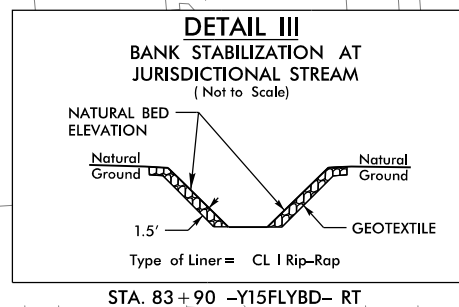
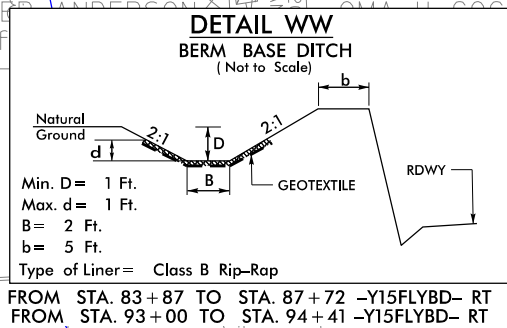
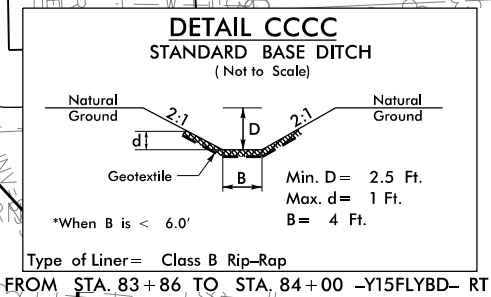


PROJECT REFERENCE NO.		SHEET NO.	
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INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
		HDR Engineering, Inc. of the Carolinas 555 Fayetteville St, Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116	
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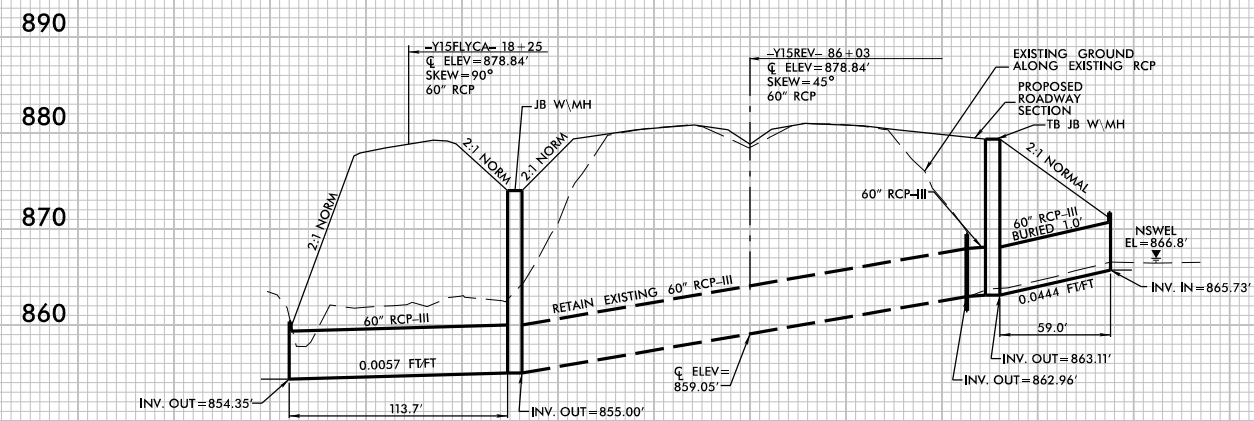
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 DENOTES IMPACTS IN SURFACE WATER

SITE 19
ESE-S58



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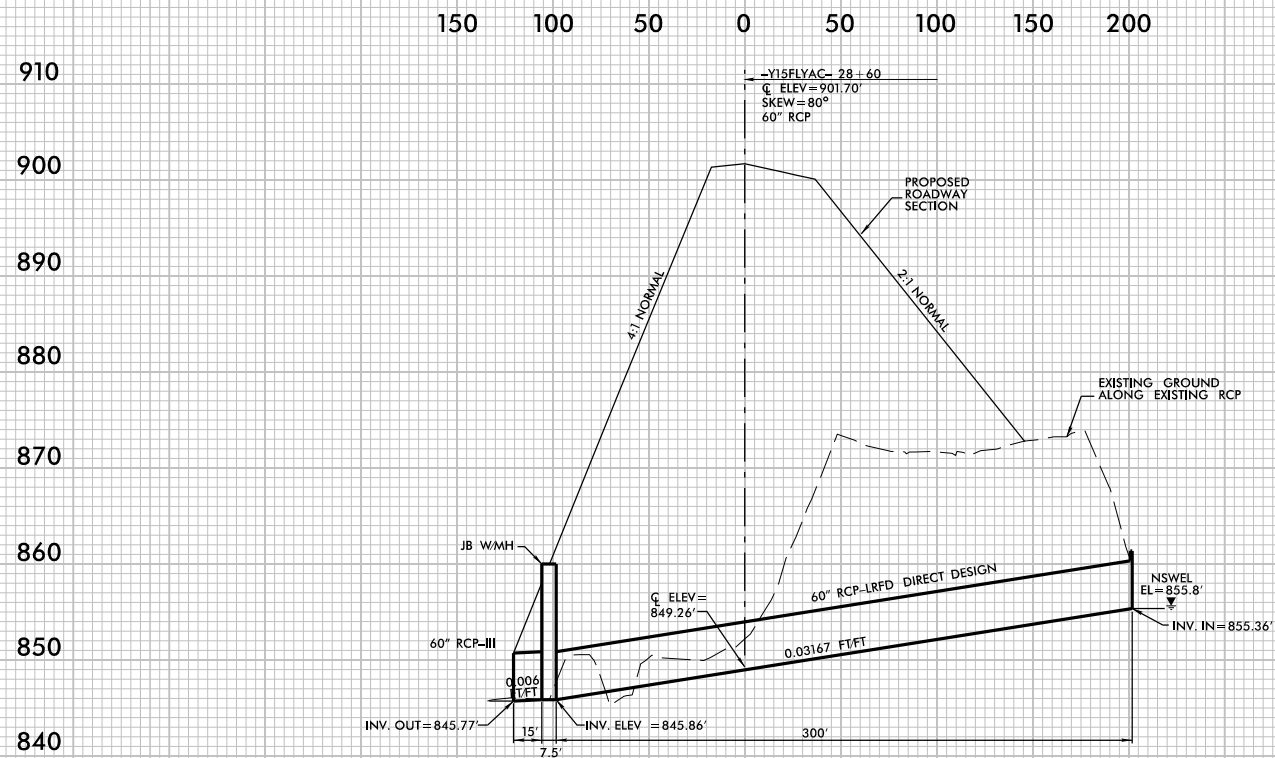


PROFILE ALONG Q_L OF PIPE

PERMIT DRAWINGS
SHEET 58 OF 74

 HDR Engineering, Inc. of the Carolinas 555 Fayetteville St. Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116	PROJECT REFERENCE NO.		SHEET NO.
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	ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER
	DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED		

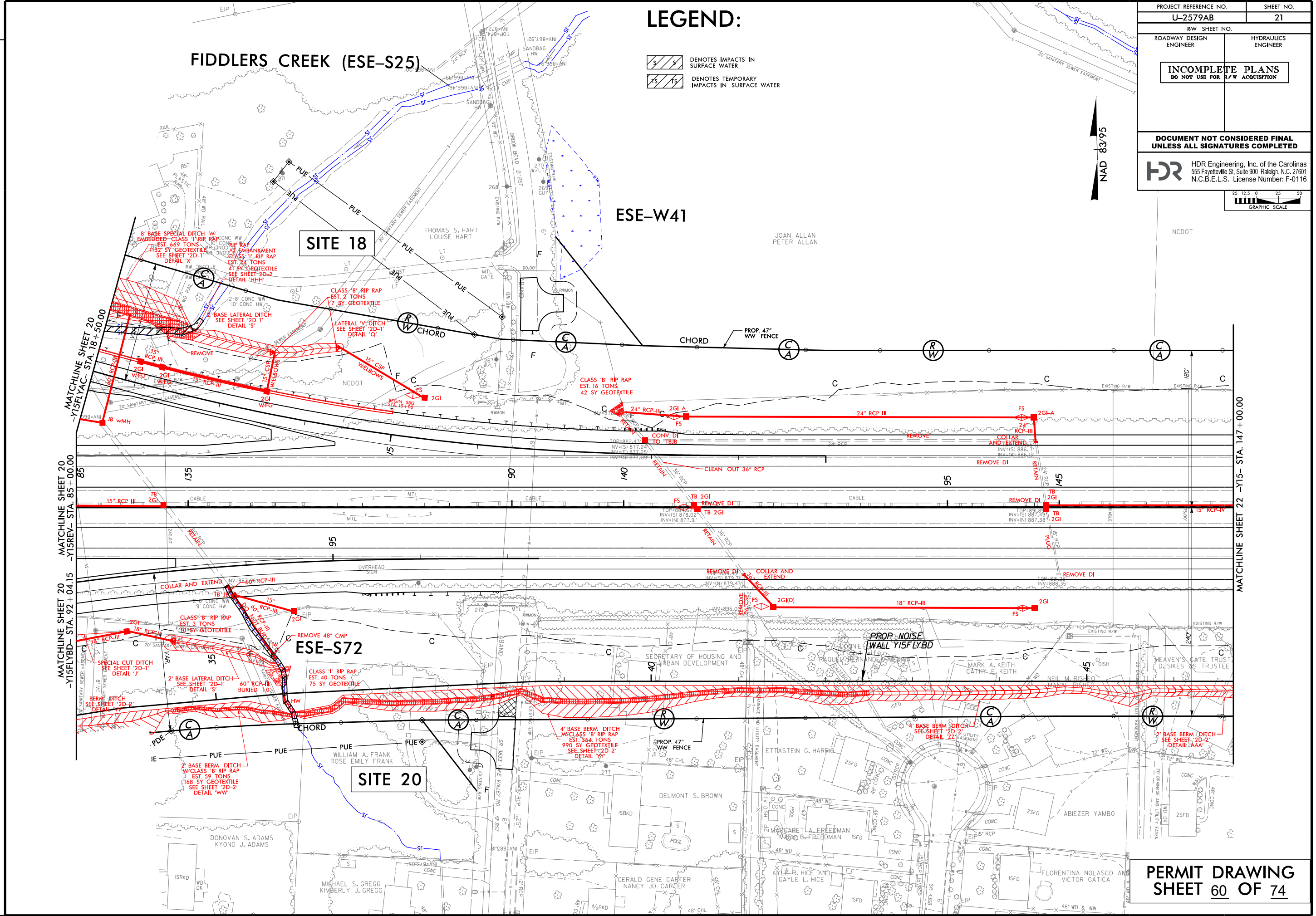
U-2579AB – SITE 19



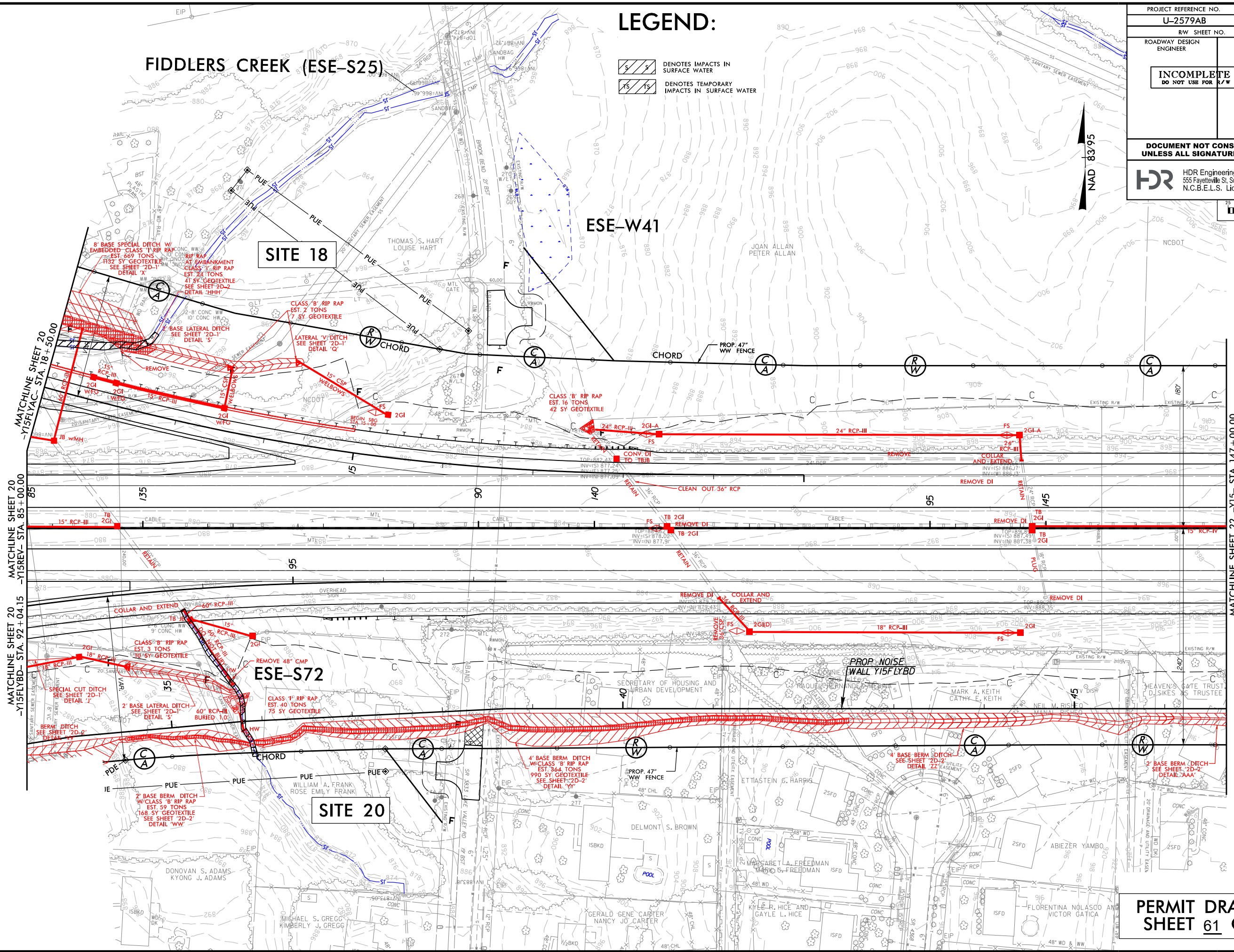
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REVISIONS



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LEGEND:

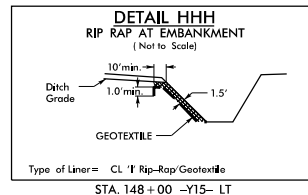
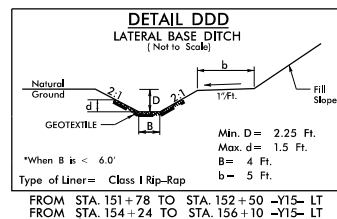
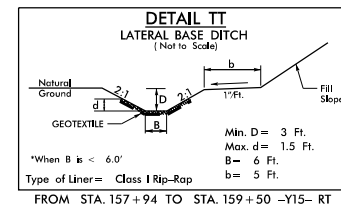
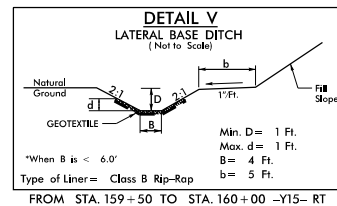
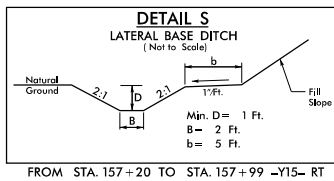
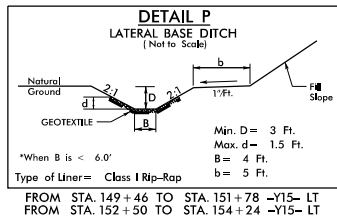
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER

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INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
HDR Engineering, Inc. of the Carolinas 555 Fayetteville St, Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116			
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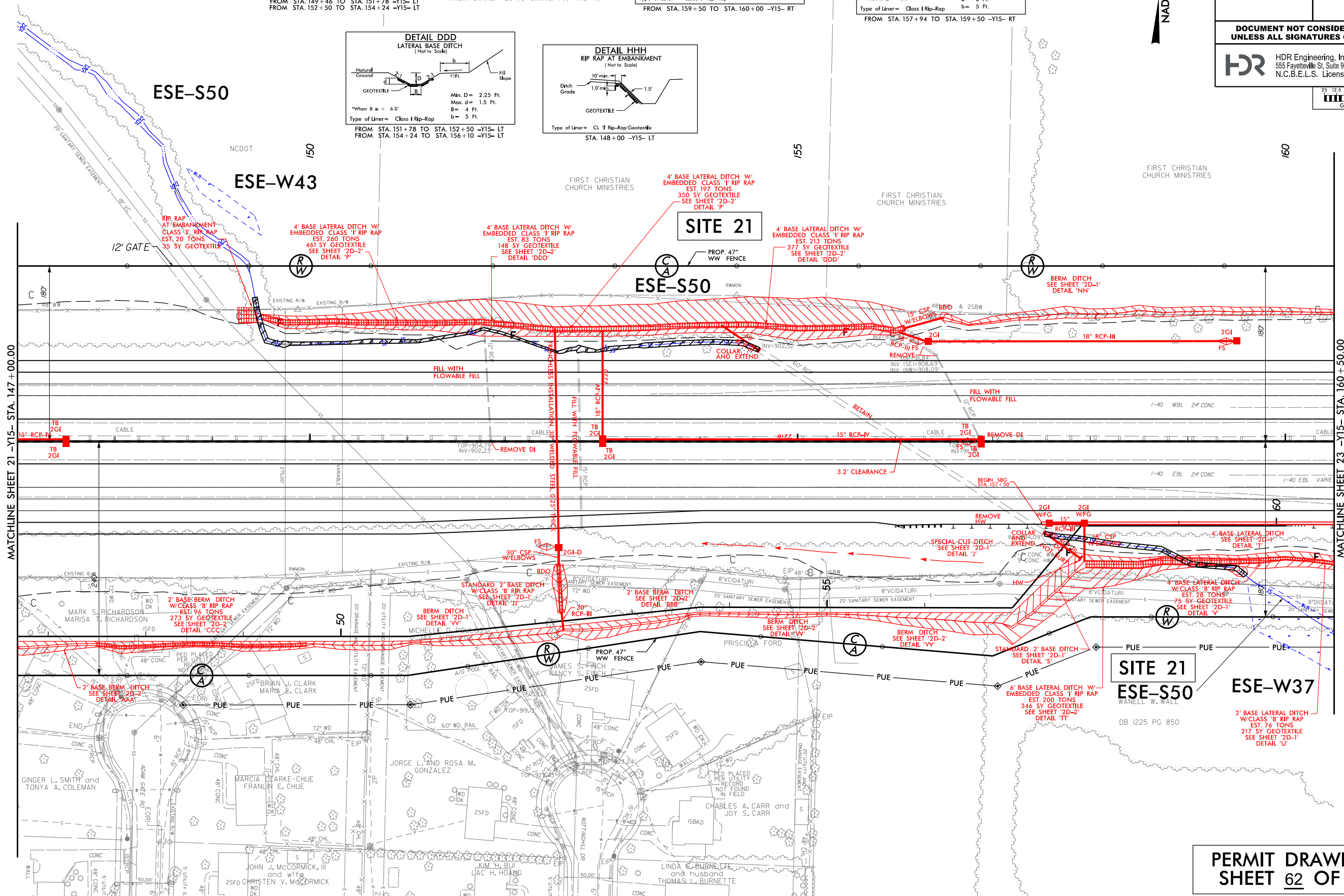
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 DENOTES IMPACTS IN SURFACE WATER
 DENOTES TEMPORARY IMPACTS IN SURFACE WATER



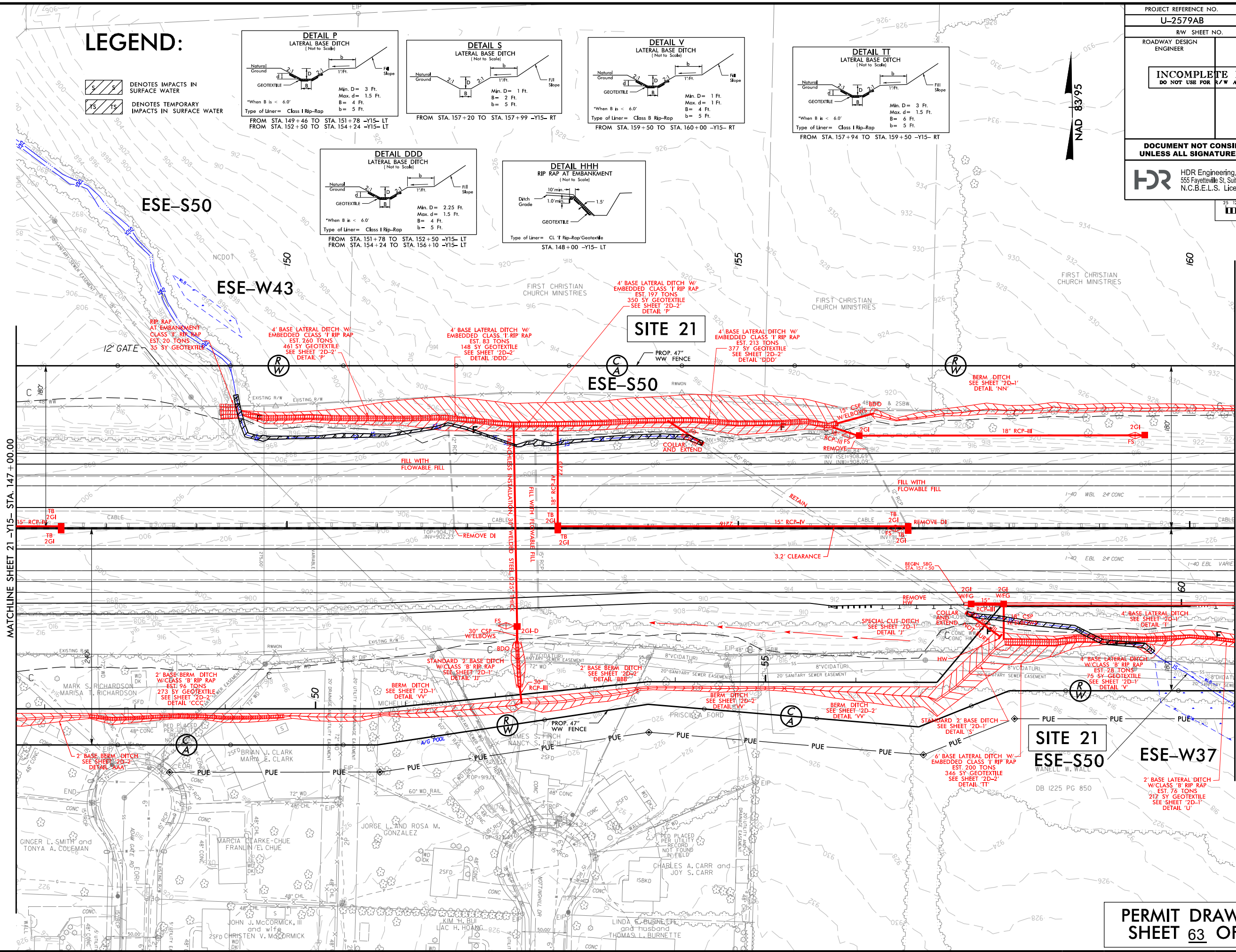
NAD 83/95

PROJECT REFERENCE NO.		SHEET NO.	
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INCOMPLETE PLANS DO NOT USE FOR A/W ACQUISITION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
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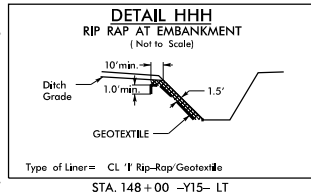
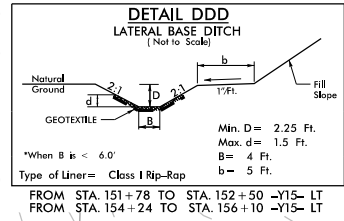
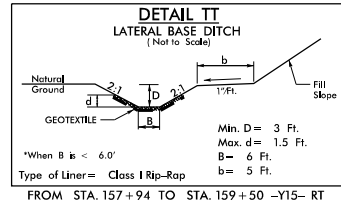
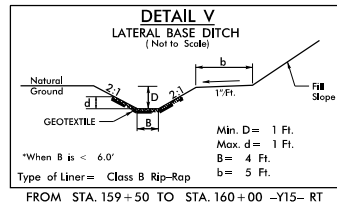
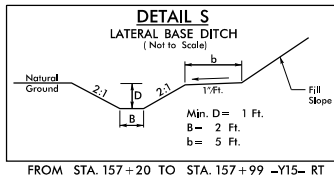
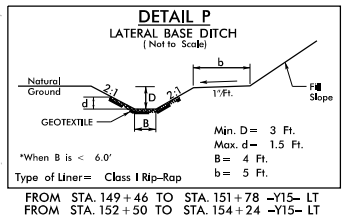
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REVISIONS



LEGEND:

- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER



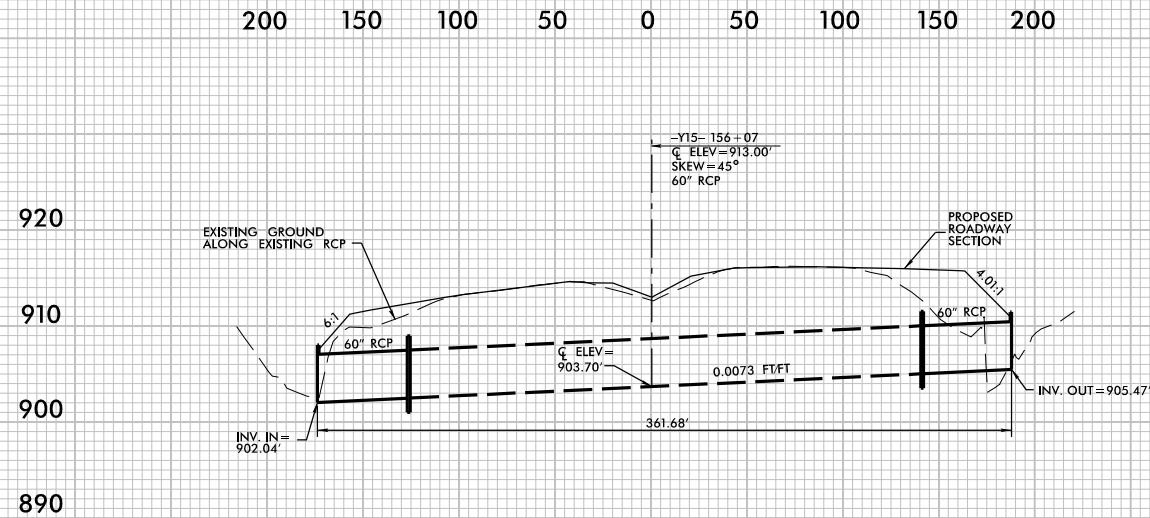
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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
HDR Engineering, Inc. of the Carolinas 555 Fayetteville St., Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116			
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REVISIONS

5/14/99

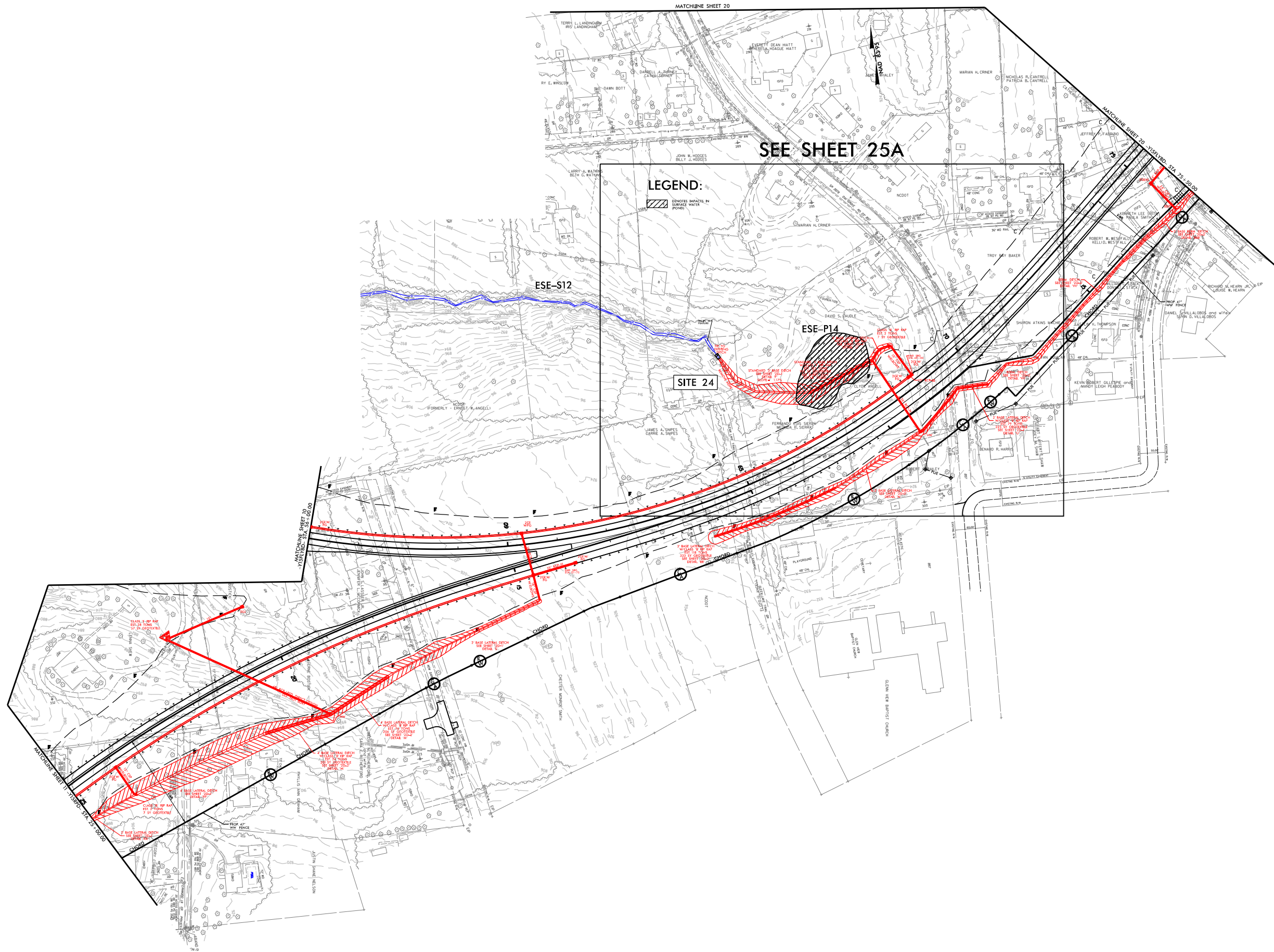
	HDR Engineering, Inc. of the Carolinas 555 Fayetteville St, Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116	PROJECT REFERENCE NO.		SHEET NO.
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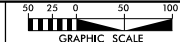
U-2579AB – SITE 21



PROFILE ALONG Q OF PIPE

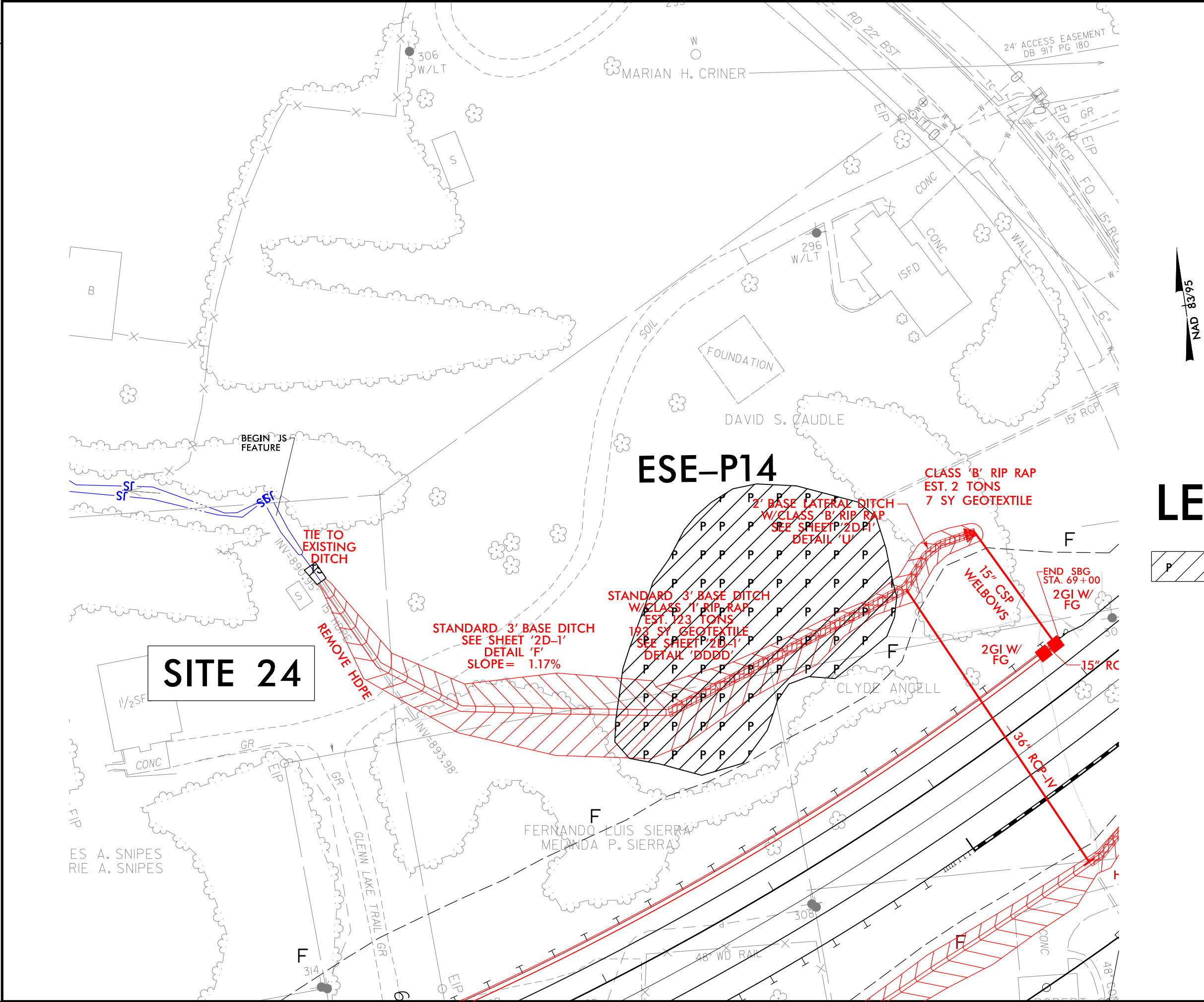
REVISIONS



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 HDR Engineering, Inc. of the Carolinas 555 Fayetteville St, Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116			
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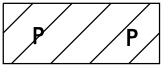
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REVISIONS



PROJECT REFERENCE NO.		SHEET NO.	
U-2579AB		25A	
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ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION			
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
HDR Engineering, Inc. of the Carolinas 555 Fayetteville St, Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116			
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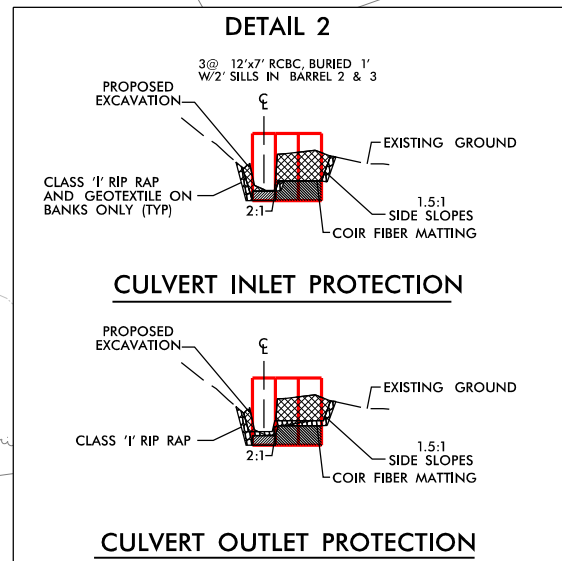


DENOTES IMPACTS IN
SURFACE WATER
(POND)

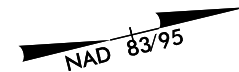
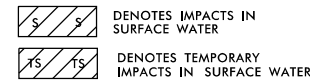
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REVISIONS

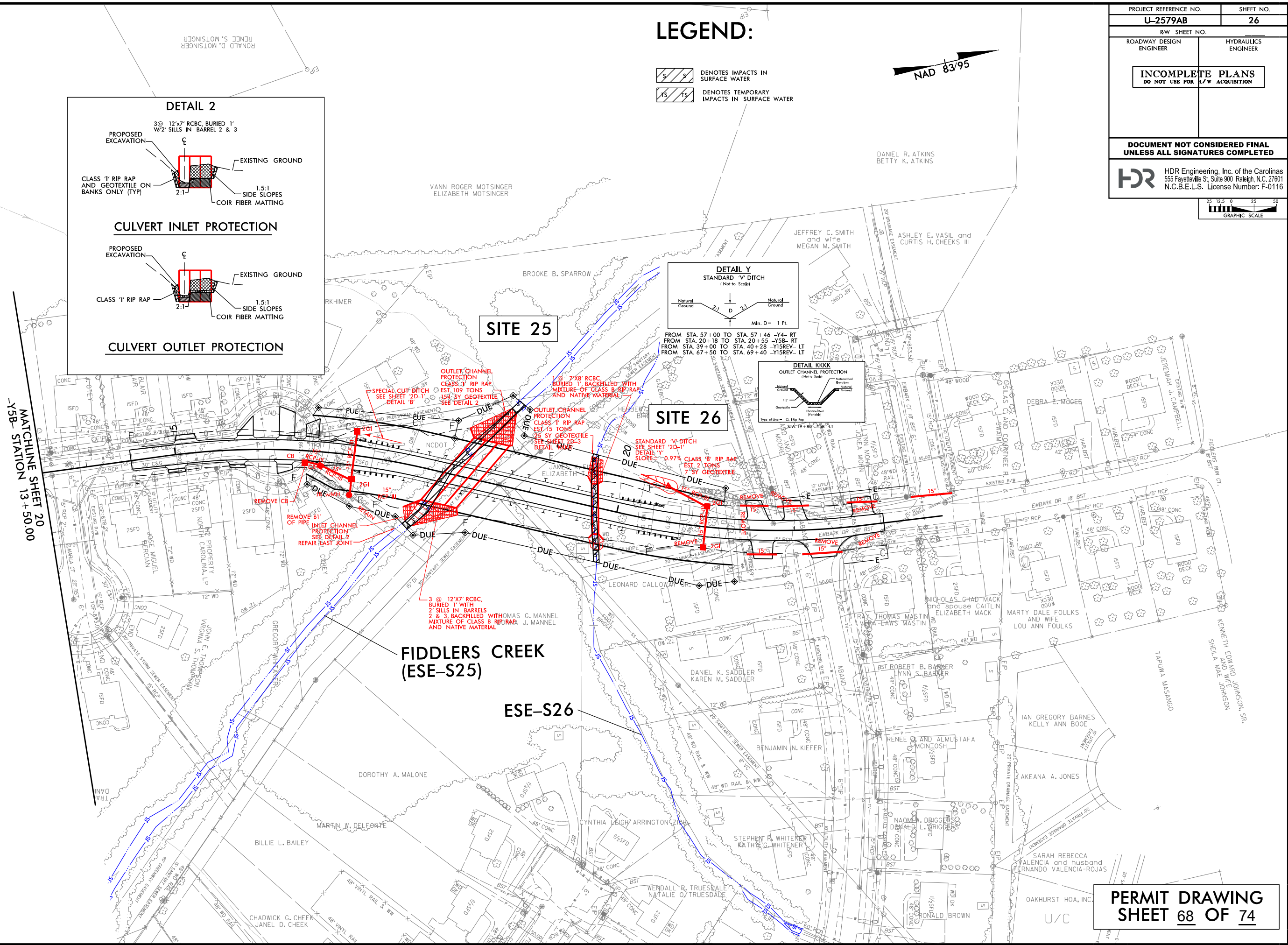
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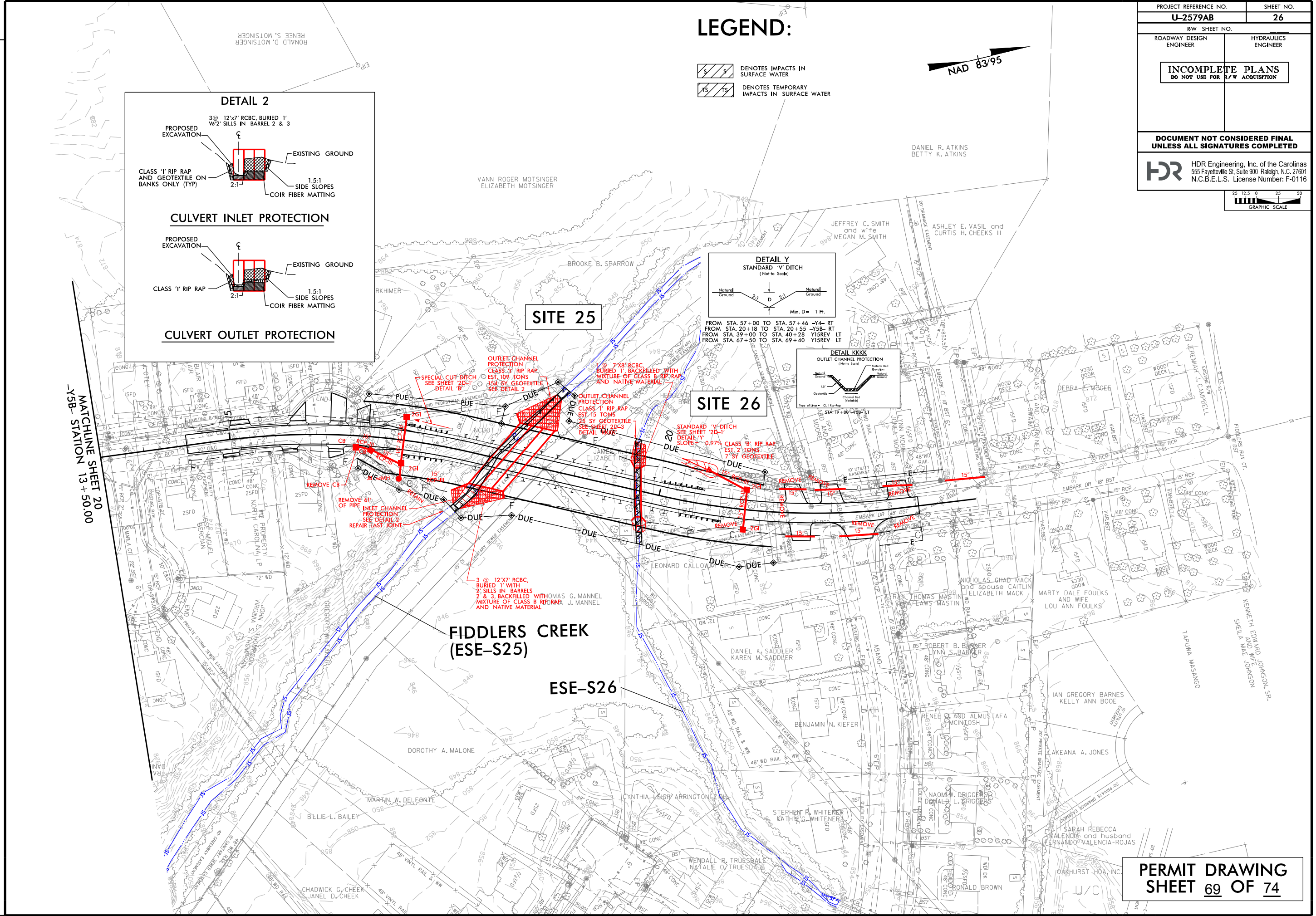


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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
 HDR Engineering, Inc. of the Carolinas 555 Fayetteville St., Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116			
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PERMIT DRAWING
SHEET 68 OF 74

REVISIONS



PROJECT REFERENCE NO.		SHEET NO.	
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R/W SHEET NO.			
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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED			
 HDR Engineering, Inc. of the Carolinas 555 Fayetteville St. Suite 900 Raleigh, N.C. 27601 N.C.B.E.L.S. License Number: F-0116			
2512.50  2550 GRAPHIC SCALE			

REVISIONS

5/14/99



HDR Engineering, Inc. of the Carolinas
555 Fayetteville St. Suite 900 Raleigh, N.C. 27601
N.C.B.E.L.S. License Number: F-0116

PROJECT REFERENCE NO.

U-2579AB

SHEET NO.

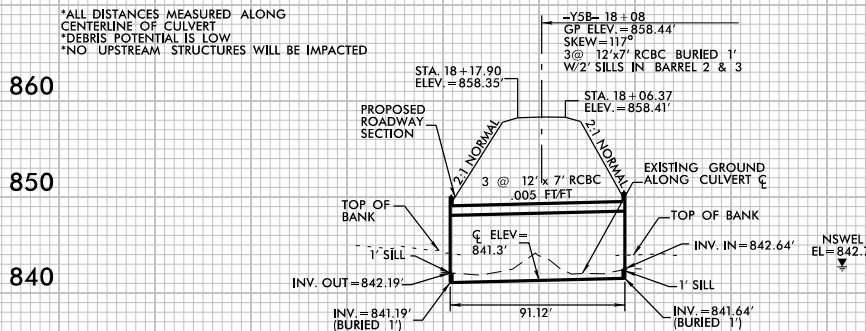
ROADWAY DESIGN
ENGINEER

HYDRAULICS
ENGINEER

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

U-2579AB – SITE 25

100 50 0 50 100



PROFILE ALONG C OF CULVERT

REVISIONS

5/14/99

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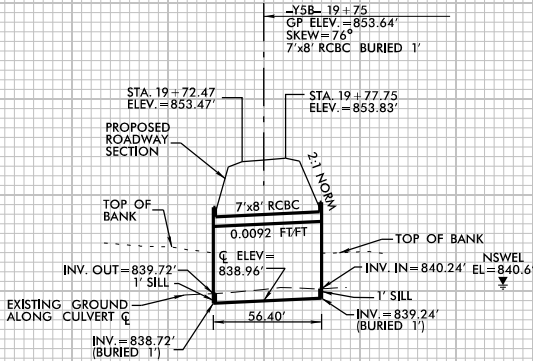
U-2579AB – SITE 26

*ALL DISTANCES MEASURED ALONG
CENTERLINE OF CULVERT
*DEBRIS POTENTIAL IS LOW
*NO UPSTREAM STRUCTURES WILL BE IMPACTED

860

850

840



PROFILE ALONG C OF CULVERT

WETLAND PERMIT IMPACT 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	Y4RPB 20+29 RT	30" RCP-III						0.02	< 0.01	125	18	
2	Y4 40+43 RT	36" CSP /PSH						< 0.01		72		
2	Y4 40+43 RT	BANK STABILIZATION						< 0.01		14		
3	L 746+02 RT	54" RCP-IV						0.10	< 0.01	137	12	
4	L 748+64 - 750+76 LT	ROADWAY FILL						0.01		74		
4A	L 750+02 - 753+80 LT	ROADWAY FILL	0.13									
4B	L 748+64 - 750+76 LT	FILL IN POND						0.89				
5	L 755+00 - 758+02 LT	PIPE REM./ PROP. DITCH						< 0.01	< 0.01	28	32	
5A	L 758+02 LT	PIPE REM./ PROP. DITCH					< 0.01					
6	L 768+62	2 @ 12' x 10' RCBC						0.15	< 0.01	670	10	
6	L 768+62	BANK STABILIZATION						< 0.01	< 0.01	26	10	
6A	L 764+50 LT	ROADWAY FILL	0.03									
7	Y15FLYBD	54" RCP-IV						0.03	< 0.01	192	20	
7A	Y15FLYBD	54" RCP-IV	0.36									
8	L 781+44	42" RCP-III						0.05	< 0.01	444		
8	L 781+44	BANK STABILIZATION						< 0.01	< 0.01	17	10	
9	L 793+80	6' x 8' RCBC						0.06	< 0.01	570	20	
10	L 798+10	60" RCP-V						0.08		668		
12	Y15REV 31+45 RT	5' x8' RCBC						0.14		650		
12A	Y15REV 31+45 RT	5' x8' RCBC	0.08			0.17						
12B	Y15REV 31+45 RT	FILL IN POND						2.37				
TOTALS*:			Project Totals	0.60		0.17	< 0.01	3.91	0.02	3687	132	0

*Rounded totals are sum of actual impacts

NOTES:

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WETLAND PERMIT IMPACT 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)
13	L 833+21	36" RCP						0.06	< 0.01	504	10	
13	L 833+21 LT	BANK STABILIZATION						< 0.01		28		
13A	L 833+21	ROADWAY FILL	0.08									
14	Y15 31+20 RT	72" RCP-III						< 0.01	< 0.01	66	53	
14A	Y15 31+50 - 35+18	ROADWAY FILL	0.14			0.03						
15	Y15 48+97	42" RCP-III						< 0.01	< 0.01	60	30	
16	Y15 64+60	54" RCP-III						0.02	< 0.01	249	45	
17	Y15REV 30+00	8' x7' RCBC						0.03		267		
17A	Y15REV 30+00 RT	8' x7' RCBC	0.06									
17B	Y15REV 30+50 RT	8'x7' RCBC	0.09									
17C	Y15REV 30+50 RT	8' x7' RCBC	0.03									
18	5FLYAC 17+44 - 29+08 F	ROADWAY FILL						0.17	0.02	943	65	
19	Y15REV 76+47	ROADWAY FILL						0.03	< 0.01	251	10	
20	Y15REV 86+03	60" RCP-III						0.02	< 0.01	175	10	
21	Y15 149+41 - 154+60 LT	ROADWAY FILL						0.48	< 0.01	548	10	
21	Y15 157+53 - 159+59 RT	ROADWAY FILL						0.02	< 0.01	180	34	
22	Y4RPB 20+55 RT	2' BASE DITCH						< 0.01		67		
TOTALS*:			0.40			0.03		0.85	0.03	3338	267	0

*Rounded totals are sum of actual impacts

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WETLAND PERMIT IMPACT 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)
23	L 830+95 - 833+21 LT	ROADWAY FILL						< 0.01	< 0.01	61	10	
23A	L 832+00 LT	ROADWAY FILL	0.22			0.08						
24	Y15FLYFLBD 67+67 LT	FILL IN POND						0.35	< 0.01		10	
25	Y5B 18+06	3 @ 12' x 7' RCBC						0.03	< 0.01	139	10	
25	Y5B 18+06	BANK STABILIZATION						< 0.01	< 0.01	35	5	
26	Y5B 19+75	7' x8' RCBC						0.02	< 0.01	105	10	
27	Y15 36+87 RT	42" RCP-III						< 0.01	< 0.01	26	10	
28	Y15REV 30+10 RT	8' x7' RCBC						0.13		114		
29	Y15REV 29+24-38+84	ROADWAY FILL						0.10	< 0.01	1023	10	
30	Y15RPB 31+30 RT	6' BASE DITCH							< 0.01		10	
		TOTALS SHEET 1	0.60			0.17	< 0.01	3.91	0.02	3687	132	
		TOTALS SHEET 2	0.40			0.03		0.85	0.03	3338	267	
		TOTALS SHEET 3	0.22			0.08		0.63	0.01	1503	75	
TOTALS*:			Project Totals	1.22		0.28	< 0.01	5.39	0.06	8528	474	0

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