



North Carolina Department of Transportation

Highway Stormwater Program  
STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS



(Version 2.08; Released April 2018)

WBS Element: 36030.1.1      TIP No.: I-4700      County(ies): Buncombe Henderson      Page 1 of 13

General Project Information

WBS Element:	36030.1.1	TIP Number:	I-4700	Project Type:	Roadway Widening	Date:	11/6/2018
NCDOT Contact:	Wanda H. Austin, PE CPM		Contractor / Designer:	Joseph Olson, PE			
Address:	253 Webster Road Sylva, NC 28779		Address:	343 E. Six Forks Road, Suite 200, Raleigh, NC 27609			
	Phone:	828-586-2141		Phone:	919-424-0480		
	Email:	<a href="mailto:whaustin@ncdot.gov">whaustin@ncdot.gov</a>		Email:	<a href="mailto:jsolson@HNTB.com">jsolson@HNTB.com</a>		
City/Town:	Asheville		County(ies):	Buncombe	Henderson		
River Basin(s):	French Broad		CAMA County?	No	No		
Wetlands within Project Limits?	Yes						

Project Description

Project Length (lin. miles or feet):	7.49	Surrounding Land Use:	Suburban
Project Built-Up Area (ac.)		Existing Site	
138.2 ac.		98.0 ac.	
Typical Cross Section Description:	8-lane divided interstate highway with a closed median and shoulders		4-lane divided interstate highway with a grass median and shoulders

Annual Avg Daily Traffic (veh/hr/day):	Design/Future:	Year:	Existing:	Year:
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**General Project Narrative:**  
**(Description of Minimization of Water Quality Impacts)**

I-4700 involves the widening of Interstate I-26 from a 4-lane, median-divided facility to an 8-lane, median-divided facility from NC 280 (Airport Road) to the I-40/I-240 interchange. For design and construction purposes, however, the I-26 Widening design will tie into a point approximately 3,400 ft north of Ferry Road (SR 3482), allowing it to tie into STIP Project I-5504, which is currently under construction. The existing typical section is a 4-lane, median-divided facility consisting of 12-foot travel lanes with grassed median. Existing roadway will be replaced with an 8-lane, median-divided facility consisting of 12-foot travel lanes with paved median. Jurisdictional features including wetlands, streams, and a crossing of the French Broad River are present within project limits. The proposed roadway improvements will require the majority of the existing drainage system to be replaced and new roadway ditches. Retaining walls were used in 22 locations to reduce the extent of impacts along the project corridor. In addition, slopes were steepened to 1.5:1, in accordance with geotechnical recommendations, thus reducing impacts to the Biltmore Bog. Rip Rap pads were used at pipes outlets throughout the project to reduce water velocities into wetlands and jurisdictional streams. Special design "Energy Dissipators" were used at strategic locations where pipe outlets were adjacent to jurisdictional streams. The Sediment and Erosion Control Plan for I-4700 has been designed using Environmentally Sensitive Area (ESA) criteria for jurisdictional streams flowing into the French Broad River. ESA designation requires special procedures to be followed for construction activities within 50' of each designated stream. The portion of project from the Blue Ridge Parkway bridge north to NC 191 (Brevard Road) interchange has been designed using Design Standards in Sensitive Watersheds (DSSW), which includes additional limitations on denuded areas and specifies Erosion Control Measures that are designed to protect during a 25-year storm event. Post Construction Stormwater Program will be implemented throughout I-4700 and the additional sections of the I-4400 corridor to the maximum extent practical.

Waterbody Information

Surface Water Body (1):	SDD - UT to French Broad River		NCDWR Stream Index No.:	6-(54.75)	
NCDWR Surface Water Classification for Water Body	Primary Classification:	Class B			
	Supplemental Classification:				
Other Stream Classification:					
Impairments:					
Aquatic T&E Species?	Comments:				
NRTR Stream ID:	SDD		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**

<b>Surface Water Body (2):</b>	SDC - UT to French Broad River		<b>NCDWR Stream Index No.:</b>	6-(54.75)	
<b>NCDWR Surface Water Classification for Water Body</b>	<b>Primary Classification:</b>		Class B		
	<b>Supplemental Classification:</b>				
<b>Other Stream Classification:</b>					
<b>Impairments:</b>					
<b>Aquatic T&amp;E Species?</b>	Comments:				
<b>NRTR Stream ID:</b>	SDC		<b>Buffer Rules in Effect:</b>	N/A	
<b>Project Includes Bridge Spanning Water Body?</b>	No	<b>Deck Drains Discharge Over Buffer?</b>	N/A	<b>Dissipator Pads Provided in Buffer?</b>	N/A
<b>Deck Drains Discharge Over Water Body?</b>	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)					

<b>Surface Water Body (3):</b>	SDE - UT to French Broad River		<b>NCDWR Stream Index No.:</b>	6-(54.75)	
<b>NCDWR Surface Water Classification for Water Body</b>	<b>Primary Classification:</b>		Class B		
	<b>Supplemental Classification:</b>				
<b>Other Stream Classification:</b>					
<b>Impairments:</b>					
<b>Aquatic T&amp;E Species?</b>	Comments:				
<b>NRTR Stream ID:</b>	SDE		<b>Buffer Rules in Effect:</b>	N/A	
<b>Project Includes Bridge Spanning Water Body?</b>	No	<b>Deck Drains Discharge Over Buffer?</b>	N/A	<b>Dissipator Pads Provided in Buffer?</b>	N/A
<b>Deck Drains Discharge Over Water Body?</b>	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)					

<b>Surface Water Body (4):</b>	SDF - UT to French Broad River		<b>NCDWR Stream Index No.:</b>	6-(54.75)	
<b>NCDWR Surface Water Classification for Water Body</b>	<b>Primary Classification:</b>		Class B		
	<b>Supplemental Classification:</b>				
<b>Other Stream Classification:</b>					
<b>Impairments:</b>					
<b>Aquatic T&amp;E Species?</b>	Comments:				
<b>NRTR Stream ID:</b>	SDF		<b>Buffer Rules in Effect:</b>	N/A	
<b>Project Includes Bridge Spanning Water Body?</b>	No	<b>Deck Drains Discharge Over Buffer?</b>	N/A	<b>Dissipator Pads Provided in Buffer?</b>	N/A
<b>Deck Drains Discharge Over Water Body?</b>	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)					

<b>Surface Water Body (5):</b>	SDG - UT to French Broad River		<b>NCDWR Stream Index No.:</b>	6-(54.75)	
<b>NCDWR Surface Water Classification for Water Body</b>	<b>Primary Classification:</b>		Class B		
	<b>Supplemental Classification:</b>				
<b>Other Stream Classification:</b>					
<b>Impairments:</b>					
<b>Aquatic T&amp;E Species?</b>	Comments:				
<b>NRTR Stream ID:</b>	SDG		<b>Buffer Rules in Effect:</b>	N/A	
<b>Project Includes Bridge Spanning Water Body?</b>	No	<b>Deck Drains Discharge Over Buffer?</b>	N/A	<b>Dissipator Pads Provided in Buffer?</b>	N/A
<b>Deck Drains Discharge Over Water Body?</b>	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**

<b>Surface Water Body (6):</b>	SFX - UT to French Broad River		<b>NCDWR Stream Index No.:</b>	6-(54.75)	
<b>NCDWR Surface Water Classification for Water Body</b>	<b>Primary Classification:</b>		Class B		
	<b>Supplemental Classification:</b>				
<b>Other Stream Classification:</b>					
<b>Impairments:</b>					
<b>Aquatic T&amp;E Species?</b>	Comments:				
<b>NRTR Stream ID:</b>	SFX		<b>Buffer Rules in Effect:</b>	N/A	
<b>Project Includes Bridge Spanning Water Body?</b>	No	<b>Deck Drains Discharge Over Buffer?</b>	N/A	<b>Dissipator Pads Provided in Buffer?</b>	N/A
<b>Deck Drains Discharge Over Water Body?</b>	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)					

<b>Surface Water Body (7):</b>	SDK - UT to French Broad River		<b>NCDWR Stream Index No.:</b>	6-(54.75)	
<b>NCDWR Surface Water Classification for Water Body</b>	<b>Primary Classification:</b>		Class B		
	<b>Supplemental Classification:</b>				
<b>Other Stream Classification:</b>					
<b>Impairments:</b>					
<b>Aquatic T&amp;E Species?</b>	Comments:				
<b>NRTR Stream ID:</b>	SDK		<b>Buffer Rules in Effect:</b>	N/A	
<b>Project Includes Bridge Spanning Water Body?</b>	No	<b>Deck Drains Discharge Over Buffer?</b>	N/A	<b>Dissipator Pads Provided in Buffer?</b>	N/A
<b>Deck Drains Discharge Over Water Body?</b>	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)					

<b>Surface Water Body (8):</b>	SDP - UT to French Broad River		<b>NCDWR Stream Index No.:</b>	6-(54.75)	
<b>NCDWR Surface Water Classification for Water Body</b>	<b>Primary Classification:</b>		Class B		
	<b>Supplemental Classification:</b>				
<b>Other Stream Classification:</b>					
<b>Impairments:</b>					
<b>Aquatic T&amp;E Species?</b>	Comments:				
<b>NRTR Stream ID:</b>	SDP		<b>Buffer Rules in Effect:</b>	N/A	
<b>Project Includes Bridge Spanning Water Body?</b>	No	<b>Deck Drains Discharge Over Buffer?</b>	N/A	<b>Dissipator Pads Provided in Buffer?</b>	N/A
<b>Deck Drains Discharge Over Water Body?</b>	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)					

<b>Surface Water Body (9):</b>	SDN - Powell Creek		<b>NCDWR Stream Index No.:</b>	6-62	
<b>NCDWR Surface Water Classification for Water Body</b>	<b>Primary Classification:</b>		Class C		
	<b>Supplemental Classification:</b>				
<b>Other Stream Classification:</b>					
<b>Impairments:</b>					
<b>Aquatic T&amp;E Species?</b>	Comments:				
<b>NRTR Stream ID:</b>	SDN		<b>Buffer Rules in Effect:</b>		
<b>Project Includes Bridge Spanning Water Body?</b>		<b>Deck Drains Discharge Over Buffer?</b>		<b>Dissipator Pads Provided in Buffer?</b>	
<b>Deck Drains Discharge Over Water Body?</b>		(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**

<b>Surface Water Body (10):</b>	SDU - UT to French Broad River		<b>NCDWR Stream Index No.:</b>	6-(54.75)	
<b>NCDWR Surface Water Classification for Water Body</b>	<b>Primary Classification:</b>		Class B		
	<b>Supplemental Classification:</b>				
<b>Other Stream Classification:</b>					
<b>Impairments:</b>					
<b>Aquatic T&amp;E Species?</b>	Comments:				
<b>NRTR Stream ID:</b>	SDU		<b>Buffer Rules in Effect:</b>	N/A	
<b>Project Includes Bridge Spanning Water Body?</b>	No	<b>Deck Drains Discharge Over Buffer?</b>	N/A	<b>Dissipator Pads Provided in Buffer?</b>	
<b>Deck Drains Discharge Over Water Body?</b>	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)					

<b>Surface Water Body (11):</b>	SDV - UT to French Broad River		<b>NCDWR Stream Index No.:</b>	6-(54.75)	
<b>NCDWR Surface Water Classification for Water Body</b>	<b>Primary Classification:</b>		Class B		
	<b>Supplemental Classification:</b>				
<b>Other Stream Classification:</b>					
<b>Impairments:</b>					
<b>Aquatic T&amp;E Species?</b>	Comments:				
<b>NRTR Stream ID:</b>	SDV		<b>Buffer Rules in Effect:</b>	N/A	
<b>Project Includes Bridge Spanning Water Body?</b>	No	<b>Deck Drains Discharge Over Buffer?</b>	N/A	<b>Dissipator Pads Provided in Buffer?</b>	
<b>Deck Drains Discharge Over Water Body?</b>	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)					

<b>Surface Water Body (12):</b>	SDW - UT to French Broad River		<b>NCDWR Stream Index No.:</b>	6-(54.75)	
<b>NCDWR Surface Water Classification for Water Body</b>	<b>Primary Classification:</b>		Class B		
	<b>Supplemental Classification:</b>				
<b>Other Stream Classification:</b>					
<b>Impairments:</b>					
<b>Aquatic T&amp;E Species?</b>	Comments:				
<b>NRTR Stream ID:</b>	SDW		<b>Buffer Rules in Effect:</b>	N/A	
<b>Project Includes Bridge Spanning Water Body?</b>	No	<b>Deck Drains Discharge Over Buffer?</b>	N/A	<b>Dissipator Pads Provided in Buffer?</b>	
<b>Deck Drains Discharge Over Water Body?</b>	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)					

<b>Surface Water Body (13):</b>	SDX - UT to French Broad River		<b>NCDWR Stream Index No.:</b>	6-(54.75)	
<b>NCDWR Surface Water Classification for Water Body</b>	<b>Primary Classification:</b>		Class B		
	<b>Supplemental Classification:</b>				
<b>Other Stream Classification:</b>					
<b>Impairments:</b>					
<b>Aquatic T&amp;E Species?</b>	Comments:				
<b>NRTR Stream ID:</b>	SDX		<b>Buffer Rules in Effect:</b>	N/A	
<b>Project Includes Bridge Spanning Water Body?</b>	No	<b>Deck Drains Discharge Over Buffer?</b>	N/A	<b>Dissipator Pads Provided in Buffer?</b>	
<b>Deck Drains Discharge Over Water Body?</b>	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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<b>Surface Water Body (14):</b>	SDY - UT to French Broad River		<b>NCDWR Stream Index No.:</b>	6-(54.75)	
<b>NCDWR Surface Water Classification for Water Body</b>	<b>Primary Classification:</b>		Class B		
	<b>Supplemental Classification:</b>				
<b>Other Stream Classification:</b>					
<b>Impairments:</b>					
<b>Aquatic T&amp;E Species?</b>	Comments:				
<b>NRTR Stream ID:</b>	SDY		<b>Buffer Rules in Effect:</b>	N/A	
<b>Project Includes Bridge Spanning Water Body?</b>	No	<b>Deck Drains Discharge Over Buffer?</b>	N/A	<b>Dissipator Pads Provided in Buffer?</b>	N/A
<b>Deck Drains Discharge Over Water Body?</b>	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)					

<b>Surface Water Body (15):</b>	SEQ - UT to French Broad River		<b>NCDWR Stream Index No.:</b>	6-(54.75)	
<b>NCDWR Surface Water Classification for Water Body</b>	<b>Primary Classification:</b>		Class B		
	<b>Supplemental Classification:</b>				
<b>Other Stream Classification:</b>					
<b>Impairments:</b>					
<b>Aquatic T&amp;E Species?</b>	Comments:				
<b>NRTR Stream ID:</b>	SEQ		<b>Buffer Rules in Effect:</b>	N/A	
<b>Project Includes Bridge Spanning Water Body?</b>	No	<b>Deck Drains Discharge Over Buffer?</b>	N/A	<b>Dissipator Pads Provided in Buffer?</b>	N/A
<b>Deck Drains Discharge Over Water Body?</b>	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)					

<b>Surface Water Body (16):</b>	SDE - UT to French Broad River		<b>NCDWR Stream Index No.:</b>	6-(54.75)	
<b>NCDWR Surface Water Classification for Water Body</b>	<b>Primary Classification:</b>		Class B		
	<b>Supplemental Classification:</b>				
<b>Other Stream Classification:</b>					
<b>Impairments:</b>					
<b>Aquatic T&amp;E Species?</b>	Comments:				
<b>NRTR Stream ID:</b>	SDE		<b>Buffer Rules in Effect:</b>	N/A	
<b>Project Includes Bridge Spanning Water Body?</b>	No	<b>Deck Drains Discharge Over Buffer?</b>	N/A	<b>Dissipator Pads Provided in Buffer?</b>	N/A
<b>Deck Drains Discharge Over Water Body?</b>	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)					

<b>Surface Water Body (17):</b>	SEF - UT to French Broad River		<b>NCDWR Stream Index No.:</b>	6-(54.75)	
<b>NCDWR Surface Water Classification for Water Body</b>	<b>Primary Classification:</b>		Class B		
	<b>Supplemental Classification:</b>				
<b>Other Stream Classification:</b>					
<b>Impairments:</b>					
<b>Aquatic T&amp;E Species?</b>	Comments:				
<b>NRTR Stream ID:</b>	SEF		<b>Buffer Rules in Effect:</b>	N/A	
<b>Project Includes Bridge Spanning Water Body?</b>	No	<b>Deck Drains Discharge Over Buffer?</b>	N/A	<b>Dissipator Pads Provided in Buffer?</b>	N/A
<b>Deck Drains Discharge Over Water Body?</b>	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)	
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<b>Surface Water Body (18):</b>	SEE - UT to French Broad River		<b>NCDWR Stream Index No.:</b>	6-(54.75)	
<b>NCDWR Surface Water Classification for Water Body</b>	<b>Primary Classification:</b>		Class B		
	<b>Supplemental Classification:</b>				
<b>Other Stream Classification:</b>					
<b>Impairments:</b>					
<b>Aquatic T&amp;E Species?</b>	Comments:				
<b>NRTR Stream ID:</b>	SEE		<b>Buffer Rules in Effect:</b>		N/A
<b>Project Includes Bridge Spanning Water Body?</b>	No	<b>Deck Drains Discharge Over Buffer?</b>	N/A	<b>Dissipator Pads Provided in Buffer?</b>	
<b>Deck Drains Discharge Over Water Body?</b>	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)					

<b>Surface Water Body (19):</b>	SFG - UT to French Broad River		<b>NCDWR Stream Index No.:</b>	6-(54.75)	
<b>NCDWR Surface Water Classification for Water Body</b>	<b>Primary Classification:</b>		Class C		
	<b>Supplemental Classification:</b>				
<b>Other Stream Classification:</b>					
<b>Impairments:</b>					
<b>Aquatic T&amp;E Species?</b>	Comments:				
<b>NRTR Stream ID:</b>	SFG		<b>Buffer Rules in Effect:</b>		N/A
<b>Project Includes Bridge Spanning Water Body?</b>	No	<b>Deck Drains Discharge Over Buffer?</b>	N/A	<b>Dissipator Pads Provided in Buffer?</b>	
<b>Deck Drains Discharge Over Water Body?</b>	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)					

<b>Surface Water Body (20):</b>	SFR - UT to French Broad River		<b>NCDWR Stream Index No.:</b>	6-(54.75)	
<b>NCDWR Surface Water Classification for Water Body</b>	<b>Primary Classification:</b>		Class C		
	<b>Supplemental Classification:</b>				
<b>Other Stream Classification:</b>					
<b>Impairments:</b>					
<b>Aquatic T&amp;E Species?</b>	Comments:				
<b>NRTR Stream ID:</b>	SFR		<b>Buffer Rules in Effect:</b>		N/A
<b>Project Includes Bridge Spanning Water Body?</b>	No	<b>Deck Drains Discharge Over Buffer?</b>	N/A	<b>Dissipator Pads Provided in Buffer?</b>	
<b>Deck Drains Discharge Over Water Body?</b>	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)					

<b>Surface Water Body (21):</b>	SFQ - UT to French Broad River		<b>NCDWR Stream Index No.:</b>	6-(54.75)	
<b>NCDWR Surface Water Classification for Water Body</b>	<b>Primary Classification:</b>		Class C		
	<b>Supplemental Classification:</b>				
<b>Other Stream Classification:</b>					
<b>Impairments:</b>					
<b>Aquatic T&amp;E Species?</b>	Comments:				
<b>NRTR Stream ID:</b>	SFQ		<b>Buffer Rules in Effect:</b>		N/A
<b>Project Includes Bridge Spanning Water Body?</b>	No	<b>Deck Drains Discharge Over Buffer?</b>	N/A	<b>Dissipator Pads Provided in Buffer?</b>	
<b>Deck Drains Discharge Over Water Body?</b>	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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**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	-WBL- Sta. 886+00 RT 35.449803,-82.540851	(1)SDD - UT to French	0.0	2.0	10.0	3.5	350	450	5.36%	8.8	2.5	12.0	2.9	No	No
8	-WBL- Sta. 887+37 RT 35.450145,-82.541039	(2)SDC - UT to French	2.0	2.0	2.0	1.5	150	169	10.62%	2.7	3.1	3.5	3.3	No	No
8	-EBL- Sta. 888+50 LT 35.450191,-82.541917	(2)SDC - UT to French	2.0	2.0	2.0	35.8	3580	450	4.99%	87.5	5.4	121.2	5.8	No	No
10	-WBL- Sta. 913+78 RT 35.457242,-82.541875	(3)SDE - UT to French	2.0	2.0	2.0	1.8	180	578	10.67%	2.7	3.9	3.8	4.3	No	No
10	-EBL- Sta. 914+12 LT 35.457111,-82.543244	(3)SDE - UT to French	0.0	4.0	2.0	0.5	50	187	2.84%	8.3	3.2	11.2	3.5	No	No
11	-WBL- Sta. 932+21 RT 35.461896,-82.544837	(4)SDF - UT to French	0.0	2.0	2.0	0.2	20	147	31.48%	0.4	4.0	0.5	4.2	No	No
12	-WBL- Sta. 937+40 RT 35.463113,-82.545765	(5)SDG - UT to French	0.0	4.0	4.0	1.3	130	115	14.24%	2.4	4.1	3.3	4.4	No	No
12	-WBL- Sta. 937+75 RT 35.463212,-82.545864	(5)SDG - UT to French	0.0	4.0	4.0	0.5	50	200	3.71%	1.2	2.1	1.6	2.2	No	No
12	-WBL- Sta. 942+74 RT 35.464264,-82.546711	(6)SFX - UT to French	0.0	4.0	2.0	0.7	70	74	1.25%	1.5	1.5	2.1	1.6	No	No
12	-WBL- Sta. 942+76 RT 35.464264,-82.546711	(6)SFX - UT to French	2.0	2.0	2.0	4.1	410	99	10.04%	6.3	3.4	8.4	3.5	No	No
13	-WBL- Sta. 953+75 RT 35.466901,-82.548575	(7)SDK - UT to French	0.0	2.0	2.0	0.8	80	275	3.33%	1.3	2.6	1.7	2.8	No	No
15	-WBL- 983+75 RT 35.474236,-82.552869	(9)SDN - Powell Creek	2.0	2.0	2.0	0.9	90	225	22.46%	2.2	4.7	3.1	5.2	No	No
19	-L2- Sta. 1027+49 RT 35.484981,-82.559090	(10)SDU - UT to French	0.0	2.0	3.0	0.6	60	99	37.37%	1.5	5.7	1.9	6.1	No	No
19	-L2- Sta. 1027+51 RT 35.484981,-82.559090	(10)SDU - UT to French	0.0	2.0	3.0	2.6	260	399	3.47%	4.2	2.4	5.6	2.5	No	No
20	-L2- Sta. 1042+74 RT 35.484986,-82.559089	(11)SDV - UT to French	0.0	2.0	2.0	0.5	50	449	21.00%	0.5	3.6	0.8	4.1	No	No
20	-L2- Sta. 1042+76 RT 35.484986,-82.559089	(11)SDV - UT to French	0.0	2.0	2.0	2.9	290	224	15.55%	2.9	5.0	3.8	5.4	No	No
20	-L2- Sta. 1042+95 RT 35.489771,-82.562175	(12)SDW - UT to French	2.0	2.0	2.0	2.5	250	495	14.07%	4.1	4.9	5.5	6.8	No	No
21	-L2- 1051+50 RT 35.49140,-82.56264		2.0	2.0	2.0	1.6	160	350	12.20%	2.0	3.7	2.7	4.1	No	No
21	-L2- 1055+32 LT 35.49136,-82.56374		4.0	2.0	2.0	13.6	1360	325	16.67%	25.8	8.2	35.0	8.9	No	No

**Additional Comments**

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**North Carolina Department of Transportation**  
**Highway Stormwater Program**  
**STORMWATER MANAGEMENT PLAN**  
 FOR NCDOT PROJECTS



(Version 2.08; Released April 2018)

WBS Element: 36030.1.1

TIP No.: I-4700

County(ies): Buncombe Henderson

Page 2 of 12

**Swales**

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Base Width (ft)	Front Slope (H:1)	Back Slope (H:1)	Drainage Area (ac)	Recommended Treatm't Length (ft)	Actual Length (ft)	Longitudinal Slope (%)	Q2 (cfs)	V2 (fps)	Q10 (cfs)	V10 (fps)	Rock Checks Used	BMP Associated w/ Buffer Rules?
23	-WBL2- 1085+30 RT 35.49888, -82.56698		0.0	2.0	2.0	15.9	1590	430	8.25%	26.9	6.9	36.0	7.6	No	No
23	-WBL@- 1091+50 RT 35.50035, -82.56800		0.0	2.0	1.0	2.5	250	240	3.35%	3.6	2.1	4.8	2.2	No	No
24	-EBL2- 1096+25 LT 35.50090, -823.56983		0.0	2.0	2.0	3.9	390	4	8.00%	5.6	3.2	7.6	4.5	No	No
24	-EBL2- 1106+97 RT 35.50381, -82.57036		20.0	3.0	3.0	3.0	304	165	6.00%	10.4	2.6	14.0	3.0	No	No
25	-EBL2- 1118+01 RT 35.50674, -82.57163		0.0	2.0	2.0	1.2	120	110	26.96%	0.6	4.1	1.9	5.6	No	No
25	-WBL2- 1121+00 RT 35.50783, -82.57181		0.0	2.0	8.0	6.3	630	320	8.00%	6.5	2.8	7.2	3.0	No	No
26	-EBL2- 1131+00 LT 35.50877, -82.57530		2.0	2.0	2.0	1.2	120	310	3.10%	1.7	2.2	2.3	2.4	No	No
26	-EBL2- 1131+01 LT 35.50877, -82.57531		0.0	2.0	17.0	0.8	80	504	9.35%	1.2	0.8	1.6	0.9	No	No
27	-L3- 1138+40 LT 35.50963, -82.57733		0.0	2.0	10.0	0.3	30	140	7.50%	0.4	1.5	0.5	0.8	No	No
27	-L3- 1138+41 LT 35.50964, -82.57736		0.0	2.0	10.0	0.9	90	160	9.43%	1.3	1.0	1.8	2.0	No	No
27	-L3- 1147+00 LT 35.51068, -82.87994		0.0	2.0	10.0	0.3	30	55	23.81%	0.4	1.0	0.5	1.0	No	No
27	-L3- 1147+05 LT 35.51068, -82.57995		0.0	2.0	10.0	2.0	200	105	8.91%	2.9	2.5	3.9	2.7	No	No
28	-L3- 1154+00 RT 35.51209, -82.58171		4.0	2.0	2.0	27.1	2710	475	0.36%	39.1	2.3	48.0	2.5	No	No
29	-L3- 1175+00 LT 35.51430, -82.58831		2.0	2.0	2.0	6.4	640	900	9.16%	9.2	3.7	12.4	3.8	No	No
29	-L3- 1175+25 RT 35.51391, -82.58664		0.0	2.0	2.0	0.1	10	175	3.24%	0.2	1.4	0.3	1.6	No	No
31	-L3- 1198+00 LT 35.51960, -82.59249		0.0	2.0	15.0	2.2	220	620	4.96%	3.2	1.9	4.2	2.4	No	No
33	-L3- 1216+15 LT 35.52339, -82.59654		0.0	2.0	10.0	1.0	100	280	7.17%	1.4	2.0	1.9	2.2	No	No
33	-L3- 1216+25 LT 35.52341, -82.59657		4.0	2.0	2.0	0.4	40	168	6.80%	0.6	1.6	0.8	1.8	No	No

**Additional Comments**

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**North Carolina Department of Transportation**  
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(Version 2.08; Released April 2018)

**WBS Element:** \_\_\_\_\_ **TIP No.:** I-4700 **County(ies):** Buncombe Henderson **Page** 9 **of** 12

**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?
4	-L1- Sta. 832+18 LT		Riprap Energy Dissipator Basin	Class 'B'	2.2	Pipe	18	9.0	3.5	No
	35.43644, -82.53319									
6	-Y13RPA- Sta. 13+44 RT		Riprap Energy Dissipator Basin	Class 'B'	7.8	Pipe	30	25.6	4.6	No
	35.442860, -82.538112									
8	-EBL- Sta. 889+07 LT	(2)SDC - UT to French	Riprap Energy Dissipator Basin	Class II	192.0	Culvert	6'x6'	360.0	10.6	No
	35.450257, -82.542176									
9	-EBL- Sta. 909+55 LT		Riprap Energy Dissipator Basin	Class I	26.6	Pipe	48	77.1	5.8	No
	35.455930, -82.543128									
10	-EBL- Sta. 914+40 LT	(3)SDE - UT to French	Riprap Energy Dissipator Basin	Class 'B'	2.2	Pipe	24	8.7	1.4	No
	35.457191, -82.543206									
10	-EBL- Sta. 919+00 LT		Riprap Energy Dissipator Basin	Class I	13.6	Pipe	36	48.9	6.4	No
	35.458391, -82.543450									
11	1115-OUT-L-932+15.76 LT	(4)SDF - UT to French	Energy Dissipator	Class I	73.7	Pipe	54	85.0	3.9	N/A
	35.461482, -82.545604									
12	-EBL- Sta. 938+85 LT	WBV	Riprap Energy Dissipator Basin	Class I	119.9	Pipe	1 - 66", 1 - 24"	131.0	6.1	No
	35.463051, -82.546791									
12	-EBL- Sta. 943+05 LT		Riprap Energy Dissipator Basin	Class 'B'	7.1	Pipe	30	27.0	3.2	No
	35.464003, -82.547574									
12	-EBL- Sta. 945+50 LT		Riprap Energy Dissipator Basin	Class 'B'	2.6	Pipe	24	9.4	1.6	No
	35.464564, -82.548032									
13	-EBL- Sta. 952+70 LT	(7)SDK - UT to French	Riprap Energy Dissipator Basin	Class I	72.3	Pipe	66	260.0	5.6	No
	35.466178, -82.549434									
13	-EBL- Sta. 955+19 LT		Riprap Energy Dissipator Basin	Class 'B'	4.7	Pipe	18	15.1	2.1	No
	35.466787, -82.549841									
13	-EBL- Sta. 958+21 LT		Riprap Energy Dissipator Basin	Class 'B'	0.2	Pipe	15	1.0	0.9	No
	35.467517, -82.550348									
13	1303-OUT -L- 981+43 LT	WBV	Energy Dissipator		3.1	Pipe	18	8.2	2.6	N/A
	35.465929, -82.549118									
14	-EBL- Sta. 972+75 LT	(8)SDP - UT to French	Riprap Energy Dissipator Basin	Class 'B'	5.3	Pipe	24	10.2	1.6	No
	35.471156, -82.552426									
14	-EBL- Sta. 976+69 LT		Riprap Energy Dissipator Basin	Class 'B'	2.7	Pipe	18	9.4	1.6	No
	35.472190, -82.552837									

**Additional Comments**

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



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**WBS Element:** \_\_\_\_\_ **TIP No.:** I-4700 **County(ies):** Buncombe Henderson **Page** 10 **of** 12

**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?
15	-EBL- Sta. 979+10 LT 35.472805,-82.553136		Riprap Energy Dissipator Basin	Class 'B'	1.8	Pipe	15	7.8	3.9	No
15	-EBL- Sta. 982+60 LT 35.473689,-82.553597		Riprap Energy Dissipator Basin	Class 'B'	0.9	Pipe	15	4.6	1.3	No
15	-EBL- Sta. 984+89 LT 35.474198,-82.554120	(9)SDN - Powell Creek	Riprap Energy Dissipator Basin	Class II	3200.0	Culvert	2 - 10'x10'	2100.0	6.4	No
15	-EBL- Sta. 986+81 LT 35.474774,-82.554125		Riprap Energy Dissipator Basin	Class 'B'	0.8	Pipe	15	3.9	2.1	No
15	-EBL- Sta. 988+21 LT 35.475142,-82.554286		Riprap Energy Dissipator Basin	Class I	14.4	Pipe	36	26.0	2.4	No
16	-EBL- Sta. 997+00 LT 35.478557,-82.555327		Riprap Energy Dissipator Basin	Class 'B'	3.0	Pipe	18	13.6	2.2	No
18	-Y15RPA- Sta. 12+61 RT 35.484131,-82.559644	(10)SDU - UT to French	Riprap Energy Dissipator Basin	Class I	42.6	Pipe	2 - 48	100.0	4.3	No
19	1901-OUT -L- 1030+10 -LT 35.484882,-82.560431	WCH	Energy Dissipator		1.6	Pipe	15	5.3	2.3	N/A
19	-L2- Sta. 1033+98 LT 35.485702,-82.561315		Riprap Energy Dissipator Basin	Class 'B'	4.8	Pipe	24	13.2	1.9	No
19	1918-OUT -L- 1037+44 -LT 35.486507,-82.562060	WCH	Energy Dissipator		3.5	Pipe	18	13.7	3.0	N/A
20	-L2- Sta. 1043+48 LT 35.488122,-82.562915		Riprap Energy Dissipator Basin	Class I	36.1	Pipe	2 - 42	80.0	5.1	No
20	2011-OUT -L- 1044+39 -LT 35.488388,-82.562965		Energy Dissipator		0.6	Pipe	15	1.3	2.5	N/A
20	2019-OUT -L- 1046+84 -LT 35.489072,-82.563137	WCH	Energy Dissipator		0.4	Pipe	15	1.3	2.5	N/A
20	-L2- Sta. 1047+77 LT 35.489330,-82.563227		Riprap Energy Dissipator Basin	Class I	151.4	Pipe	1 - 60", 1 - 42"	260.0	5.2	No
20	2032-OUT -L- 1051+86 -LT 35.490368,-82.563401		Riprap Energy Dissipator Basin	Class 'B'	1.1	Pipe	18	5.3	1.7	N/A
21	2101-Out -L- 1057+00 RT 35.49194,-82.56278		Riprap Energy Dissipator Basin	Class 'B'	0.4	Pipe	15	1.9	1.2	No

**Additional Comments**

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**WBS Element:** \_\_\_\_\_ **TIP No.:** I-4700 **County(ies):** Buncombe Henderson **Page** 11 **of** 12

**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?
21	2153 -L- 1058+62 LT 35.49229, -82.56365		Riprap Energy Dissipator Basin	Class 'B'	9.0	Pipe	30	15.0	3.6	No
21	2107 -L- 1061+00 LT 35.49295, -82.56362		Riprap Energy Dissipator Basin	Class 'B'	1.4	Pipe	18	6.0	1.9	No
21	2114-OUT -L- 1066+04 -LT 35.494175, -82.564181		Energy Dissipator		5.0	Pipe	18	10.5	2.8	N/A
21	2202-Out -L- 1068+62 LT 35.49485, -82.56436		Riprap Energy Dissipator Basin	Class 'B'	7.6	Pipe	24	24.1	2.5	No
23	2318-OUT -WBL- 1090+50 -RT 35.500109, -82.567832	(13)SDX - UT to French	Energy Dissipator		22.4	Pipe	30	32.1	3.9	N/A
23	2353 -WBL- 1094+05 LT 35.50073, -82.56898	(13)SDX - UT to French	Riprap Energy Dissipator Basin	Class I	44.9	Pipe	48	47.0	6.8	No
24	2452 -EBL- 1097+32 RT 35.50143, -82.56955	(13)SDX - UT to French	Riprap Energy Dissipator Basin	Class I	6.5	Pipe	30	11.0	0.7	No
24	2462 -EBL- 1105+40 RT 35.50329, -82.57079	(13)SDX - UT to French	Riprap Energy Dissipator Basin	Class I	14.8	Pipe	30	22.0	1.1	No
24	2414-Out -EBL- 1106+90 RT 35.50381, -82.57036	(14)SDY - UT to French	Riprap Energy Dissipator Basin	Class 'B'	3.0	Pipe	24	11.0	0.6	No
24	2415 -L-WBL- 1105+00 LT 35.503596, -82.570267	(14)SDY - UT to French	Energy Dissipator		2.6	Pipe	24	12.7	2.9	N/A
24	2473 -WBL- 1107+25 LT 35.50421, -82.57043	(13)SDX - UT to French	Riprap Energy Dissipator Basin	Class I	5.3	Pipe	24	8.0	0.4	No
25	2411-Out -EBL- 1115+40 RT 35.50595, -82.57160		Riprap Energy Dissipator Basin	Class 'B'	8.8	Pipe	30	21.2	2.4	No
25	2521-Out -EBL- 1118+96 RT 35.50694, -82.57194		Riprap Energy Dissipator Basin	Class 'B'	5.1	Pipe	24	11.7	1.4	No
25	2552 -WBL- 1120+95 RT 35.50782, -82.87181	(13)SDX - UT to French	Riprap Energy Dissipator Basin	Class I	191.5	Pipe	66	100.0	2.4	No
26	2616 -WBL- 1131+50 RT 35.509369, -82.574917	(15)SEQ - UT to French	Energy Dissipator		13.0	Pipe	36	27.6	3.7	N/A
26	2616 -WBL- 1131+68 RT 35.50939, -82.57497	(15)SEQ - UT to French	Riprap Energy Dissipator Basin	Class I	109.6	Pipe	60	70.0	2.3	No

**Additional Comments**

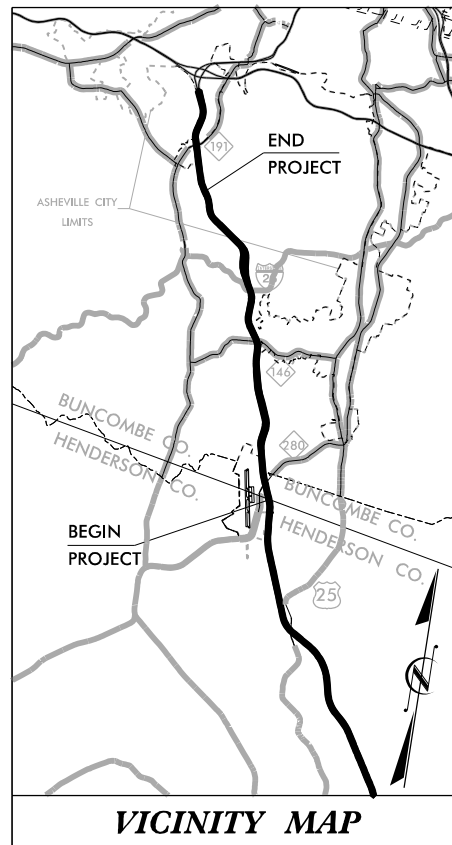
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\* Refer to the NCDOT Best Management Practices Toolbox (2014), NCDOT Standards, the Federal Highway Administration (FHWA) Hydraulic Engineering Circular No. 14 (HEC-14), Third Edition, Hydraulic Design of Energy Dissipators for Culverts and Channels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



7/24/2017

TIP PROJECT: I-4700



VICINITY MAP

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# BUNCOMBE & HENDERSON COUNTIES

LOCATION: I-26 FROM 0.3 MI EAST OF NC 280 (AIRPORT ROAD)  
TO 0.5 MI EAST OF NC 191 (BREVARD ROAD)

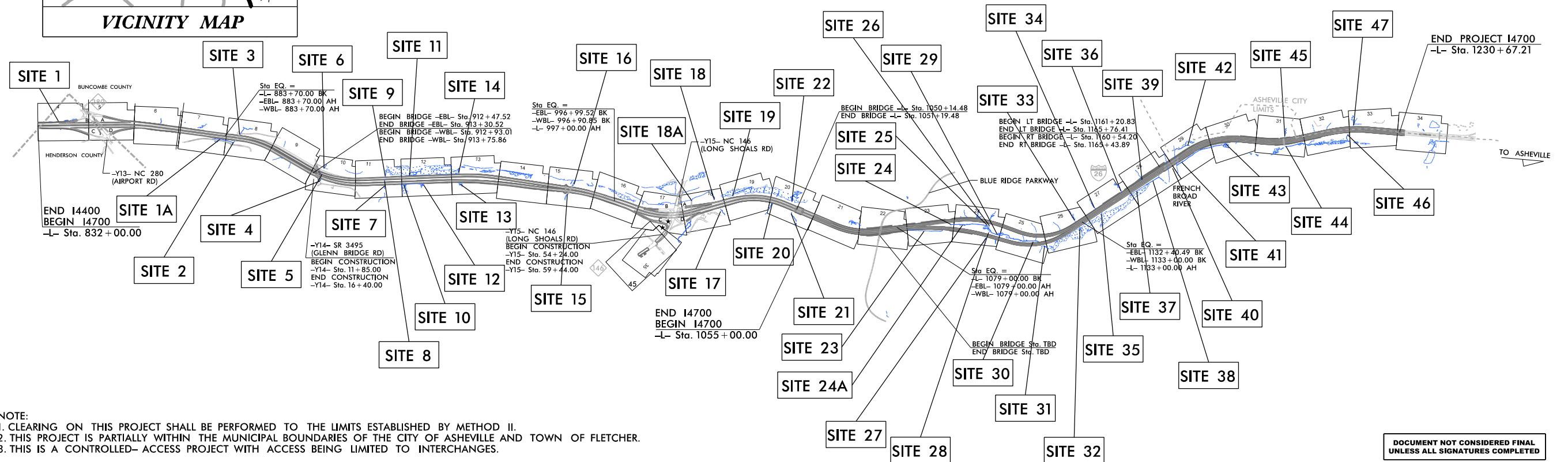
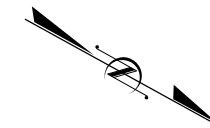
TYPE OF WORK: GRADING, PAVING, DRAINAGE, RESURFACING, AND STRUCTURES

## WETLAND AND SURFACE WATER IMPACTS PERMIT

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-4700	1	
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	
WBS 36030.1.2	IMNHF-026-1(86)9	I-4700(P.E.)	
TBD	TBD	I-4700A(RW/UTIL)	
TBD	TBD	I-4700B(RW/UTIL)	
WBS 36030.3.3	NHPP-026-1(198)3	I-4700A(CONST)	
WBS 36030.3.4	NHPP-026-1(199)6	I-4700B(CONST)	

PERMIT DRAWING  
SHEET 1 OF 97

CP4C MEETING PLANS  
11/20/2018

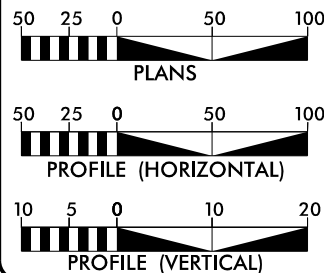


NOTE:  
1. CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.  
2. THIS PROJECT IS PARTIALLY WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF ASHEVILLE AND TOWN OF FLETCHER.  
3. THIS IS A CONTROLLED- ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

CONTRACT:

GRAPHIC SCALES



DESIGN DATA

ADT 2011 = 72,000  
ADT 2040 = 117,900  
DHV = 11,790  
D = 55%  
T = 10% \*  
V = 65 MPH  
\* TTST = 4% DUAL 6%  
FUNC CLASS = INTERSTATE  
STATEWIDE TIER

PROJECT LENGTH

TOTAL LENGTH OF ROADWAY TIP PROJECT  
I-4700A / I-4700B = 7.369 MI  
TOTAL LENGTH OF STRUCTURES OF TIP PROJECT  
I-4700A / I-4700B = 0.121 MI  
TOTAL LENGTH OF TIP PROJECT  
I-4700A / I-4700B = 7.490 MI  
NOTE: LENGTHS WERE CALCULATED USING THE WBL ALIGNMENT

Prepared in the Office of:  
**HNTB**  
HNTB NORTH CAROLINA, P.C.  
343 E. Six Forks Road, Suite 200  
Raleigh, North Carolina 27609  
NC License No. C-1554

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:  
July 1, 2018

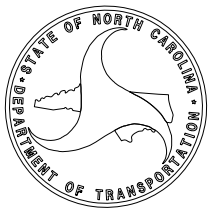
LETTING DATE:  
June 2019

JOSEPH OLSON, P.E.  
PROJECT ENGINEER  
JEFF HESS, P.E.  
PROJECT DESIGN ENGINEER  
WANDA AUSTIN, P.E.  
NCDOT CONTACT

HYDRAULICS ENGINEER

SIGNATURE: \_\_\_\_\_ P.E.  
ROADWAY DESIGN  
ENGINEER

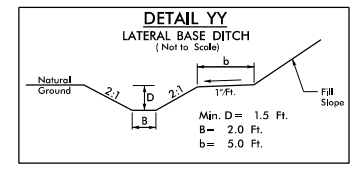
SIGNATURE: \_\_\_\_\_ P.E.



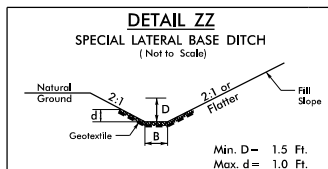
11/14/2018  
Drawings\14700A-HYD\_PRL\_TSH  
HNTB

# DRAINAGE DITCH DETAILS

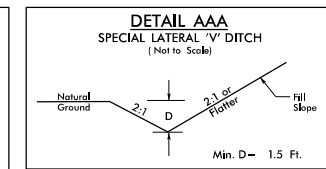
**PERMIT DRAWING SHEET 2 OF 97**



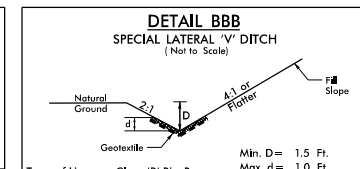
FROM -WBL- STA. 911+00 TO STA. 912+80 RT.  
 FROM -WBL- STA. 914+40 TO STA. 918+25 RT.  
 FROM -L- STA. 1051+50 TO STA. 1060+25 RT.  
 FROM -WBL- STA. 1118+75 TO STA. 1120+00 LT.



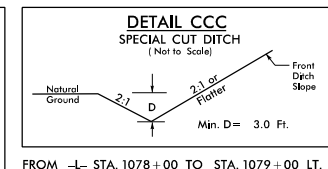
Type of Liner = Class 'B' Rip-Rap  
 FROM -L- STA. 1066+76 TO STA. 1067+75, RT.



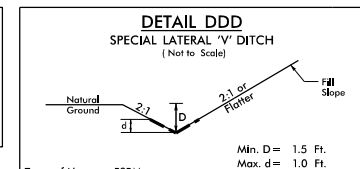
FROM -L- STA. 1066+00 TO STA. 1066+75 RT.  
 FROM -WBL- STA. 1081+00 TO STA. 1081+50 RT.



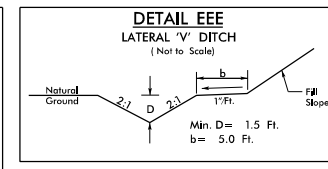
Type of Liner = Class 'B' Rip-Rap  
 FROM -L- STA. 1067+75 TO STA. 1069+00 RT.



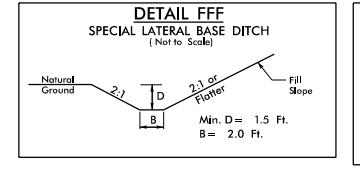
FROM -L- STA. 1078+00 TO STA. 1079+00 LT.  
 FROM -EBL- STA. 1079+00 TO STA. 1081+00 LT.



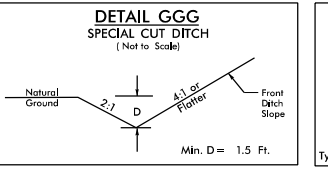
Type of Liner = PSRM  
 FROM -WBL- STA. 1118+00 TO STA. 1121+00 RT.  
 FROM -L- STA. 1183+00 TO STA. 1183+50 RT.



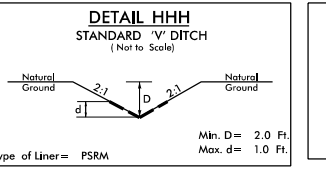
FROM -WBL- STA. 1081+50 TO STA. 1082+50 RT.



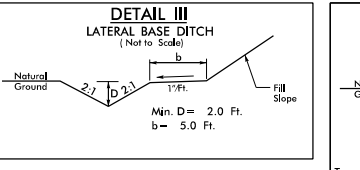
FROM -EBL- STA. 1084+50 TO STA. 1086+00 LT.  
 FROM -WBL- STA. 1119+00 TO STA. 1120+50 LT.  
 FROM -L- STA. 1159+02 TO STA. 1161+00 LT.  
 FROM -L- STA. 1176+00 TO STA. 1184+00 LT.



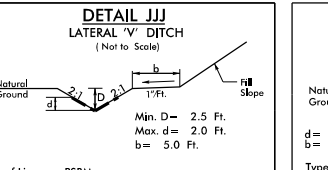
FROM -WBL- STA. 1085+50 TO STA. 1088+50, LT.



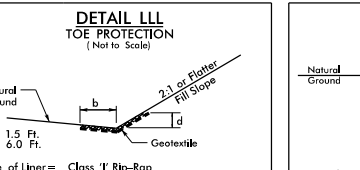
Type of Liner = PSRM  
 FROM -EBL- STA. 1093+75 TO STA. 1094+25 RT.  
 FROM -WBL- STA. 1102+75 TO STA. 1103+70 LT.  
 FROM -EBL- STA. 1118+01 RT.



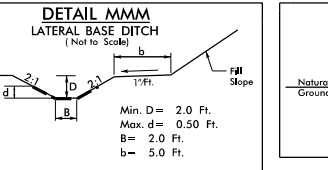
FROM STA. 1082+00 TO STA. 1085+00 RT.



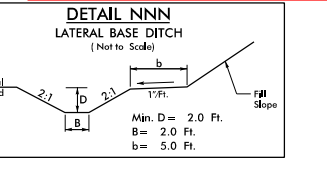
Type of Liner = PSRM  
 FROM -WBL- STA. 1082+50 TO STA. 1085+30 RT.



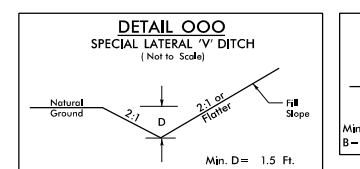
Type of Liner = Class 'I' Rip-Rap  
 FROM -EBL- STA. 1093+00 TO STA. 1096+25 LT.  
 FROM -WBL- STA. 1091+50 TO STA. 1093+89 RT.  
 FROM -WBL- STA. 1103+00 TO STA. 1104+30 RT.  
 FROM -WBL- STA. 1118+00 STA. TO STA. 1121+00, RT.



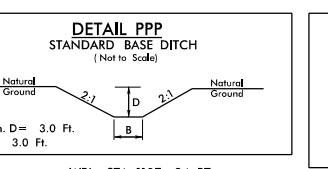
Type of Liner = PSRM  
 FROM -EBL- STA. 1105+51 TO STA. 1106+65 LT.



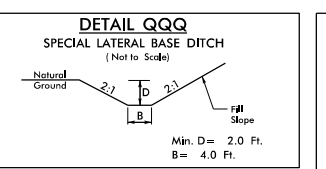
FROM -EBL- STA. 1103+80 TO STA. 1105+50 LT.  
 FROM -EBL- STA. 1127+50 TO STA. 1131+00 LT.



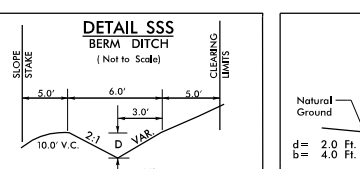
FROM -WBL- STA. 1107+25 TO STA. 1108+25 RT.  
 FROM -WBL- STA. 1115+50 TO STA. 1116+00 RT.  
 FROM -EBL- STA. 1122+00 TO STA. 1124+50 RT.  
 FROM -WBL- STA. 1125+00 TO STA. 1127+50 RT.



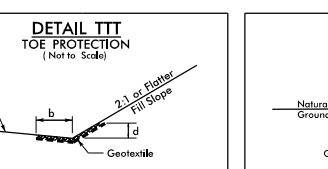
-WBL- STA. 1107+34 RT.



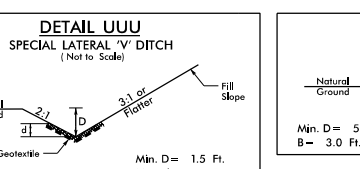
FROM -WBL- STA. 1114+00 TO STA. 1115+00 RT.



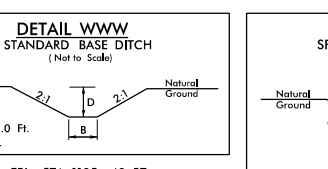
FROM -EBL- STA. 1114+51 TO STA. 1119+00 LT.  
 FROM -L- STA. 1217+75 TO STA. 1230+57.72 LT.



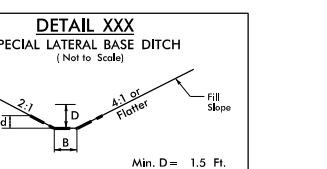
Type of Liner = Class 'B' Rip-Rap  
 FROM -EBL- STA. 1131+01 TO STA. 1132+40 LT.  
 FROM -L- STA. 1133+00 TO STA. 1140+00 LT.  
 FROM -L- STA. 1146+58 TO STA. 1148+06 LT.



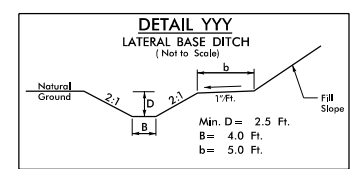
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 FROM -EBL- STA. 1124+50 TO STA. 1125+00 RT.



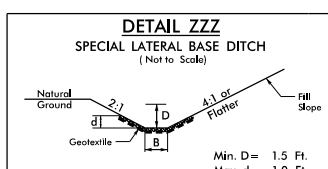
-EBL- STA. 1105+40 RT.  
 -L- STA. 1138+30 LT.  
 -L- STA. 1196+78 LT.



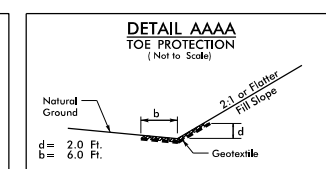
Type of Liner = PSRM  
 FROM -L- STA. 1161+00 TO STA. 1161+67 LT.



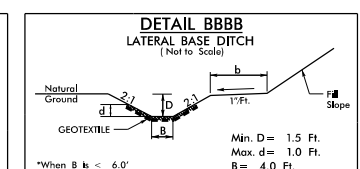
FROM -L- STA. 1149+50 TO STA. 1153+90 RT.



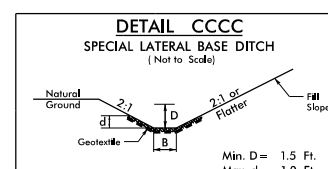
Type of Liner = Class 'I' Rip-Rap  
 FROM -L- STA. 1175+00 TO STA. 1176+00 LT.



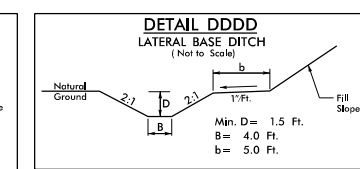
Type of Liner = Class 'B' Rip-Rap  
 FROM -L- STA. 1198+00 TO STA. 1205+25 LT.  
 FROM -L- STA. 1213+50 TO STA. 1216+15 LT.



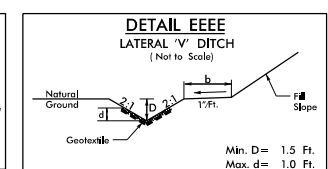
\*When B is < 6.0'  
 Type of Liner = Class 'B' Rip-Rap  
 FROM -L- STA. 1205+30 TO STA. 1207+00 LT.



Type of Liner = Class 'B' Rip-Rap  
 FROM -L- STA. 1207+00 TO STA. 1209+50 LT.

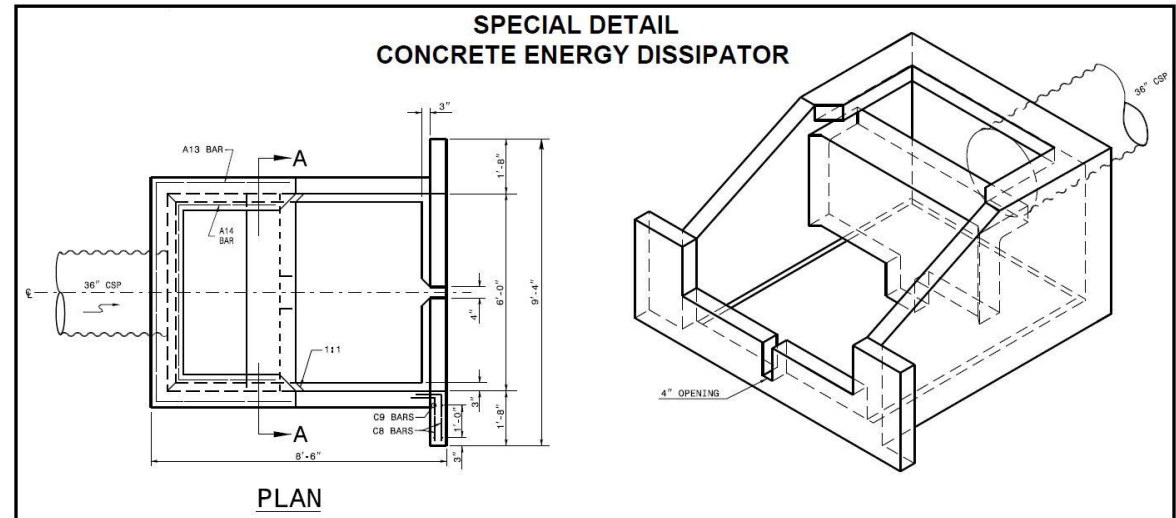
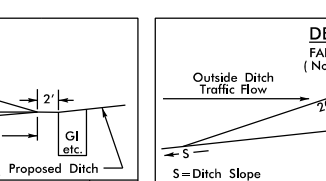
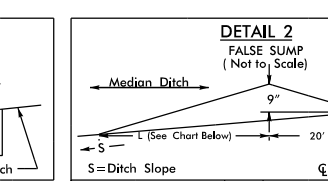
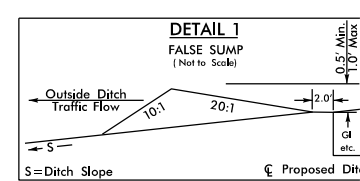
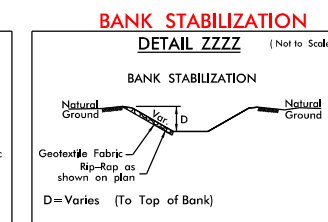
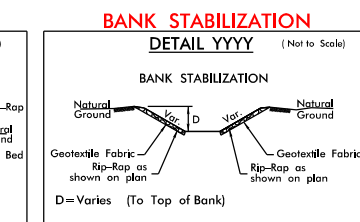
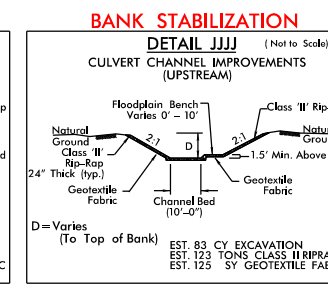
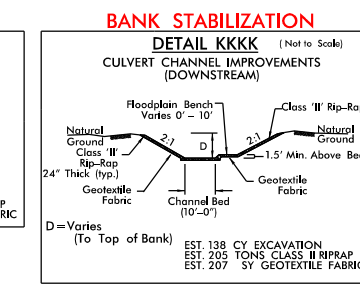
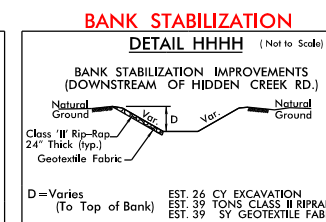
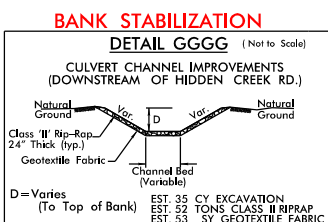
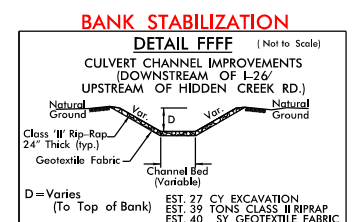
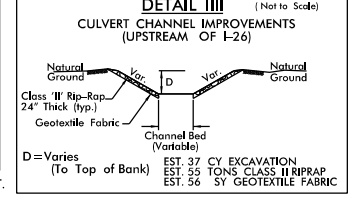


FROM -L- STA. 1216+25 TO STA. 1217+75 LT.



Type of Liner = Class 'B' Rip-Rap  
 FROM -WBL- STA. 1081+50 TO STA. 1082+50, RT.

### BANK STABILIZATION



8/17/99

11/13/2018 1-4700A-HYD\_PSH\_04.dgn

# WETLAND & STREAM IMPACTS

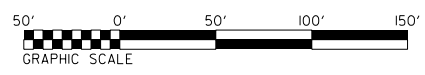
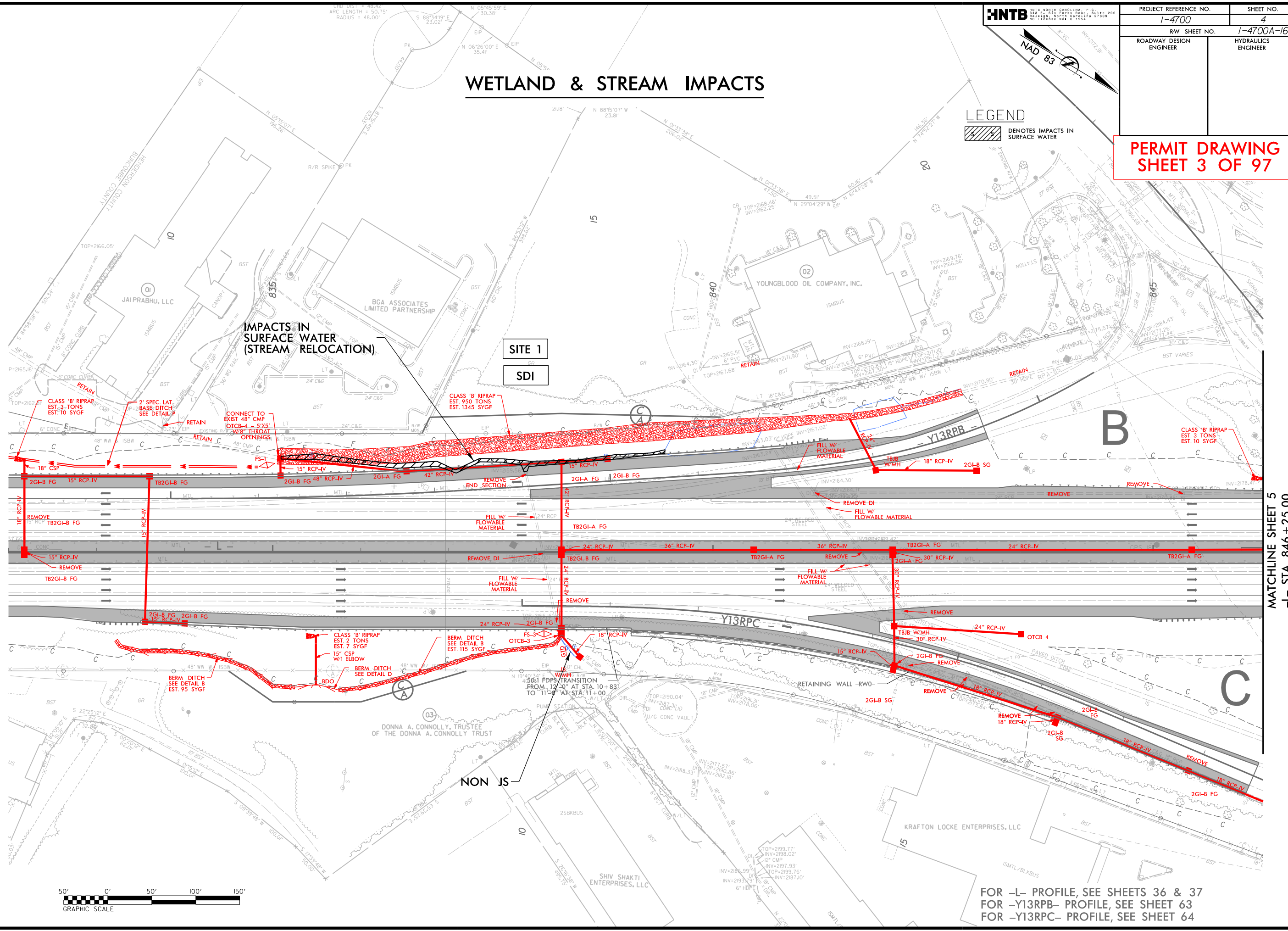
**HNTB**  
HNTB NORTH CAROLINA, P.C.  
1200 W. HARRIS STREET, SUITE 200  
RANDLEM, NC 27848  
TEL: 704.299.8800  
FAX: 704.299.8801  
WWW.HNTB.COM

PROJECT REFERENCE NO. <b>1-4700</b>	SHEET NO. <b>4</b>
R/W SHEET NO. <b>1-4700A-16</b>	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	

**PERMIT DRAWING  
SHEET 3 OF 97**

## LEGEND

 DENOTES IMPACTS IN SURFACE WATER



FOR -L- PROFILE, SEE SHEETS 36 & 37  
FOR -Y13RBP- PROFILE, SEE SHEET 63  
FOR -Y13RPC- PROFILE, SEE SHEET 64

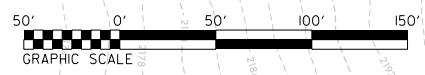
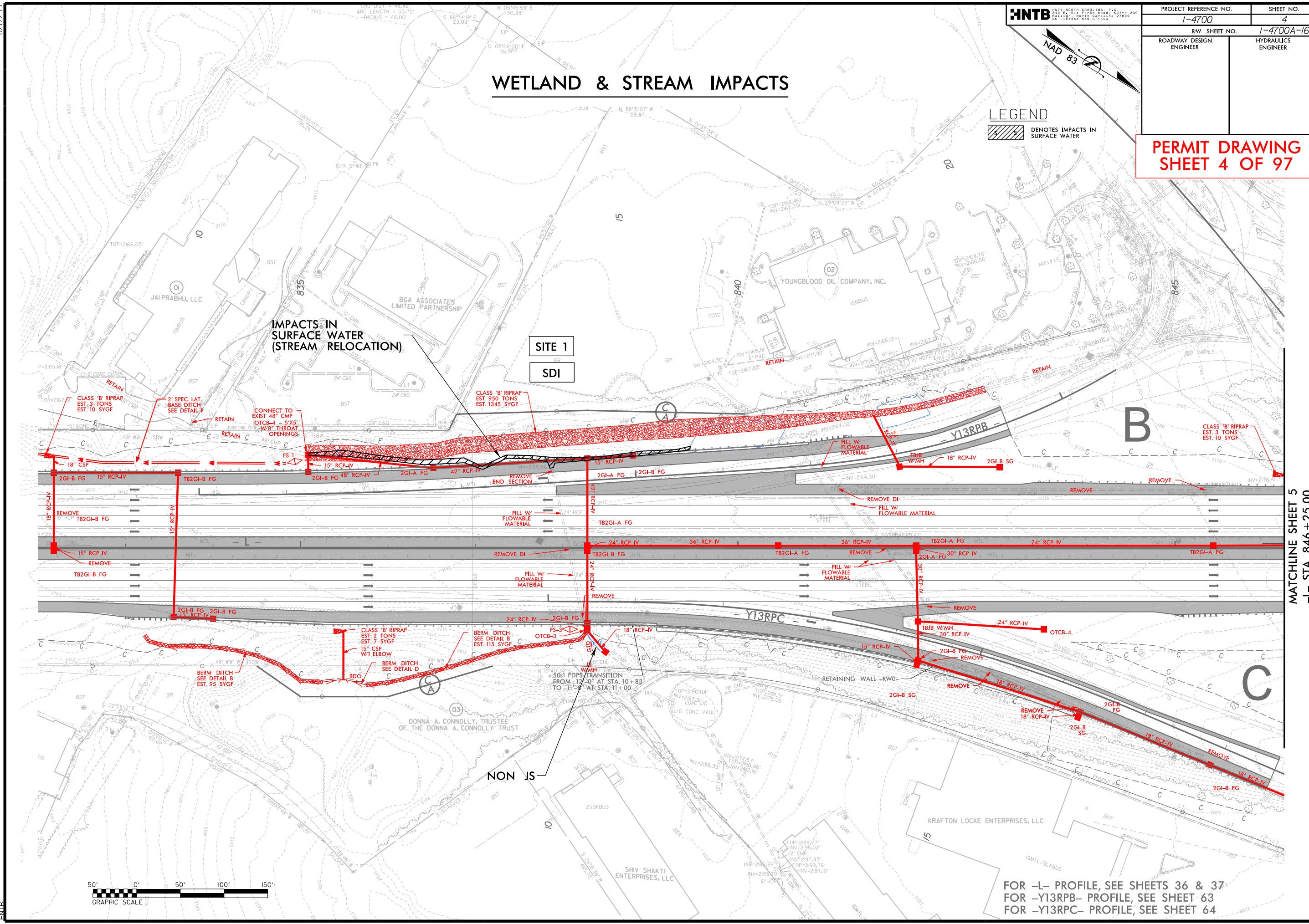
MATCHLINE SHEET 5  
-L- STA 846 + 25.00

# WETLAND & STREAM IMPACTS

## LEGEND

Denotes impacts in surface water

PERMIT DRAWING SHEET 4 OF 97



FOR -L- PROFILE, SEE SHEETS 36 & 37  
 FOR -Y13RPB- PROFILE, SEE SHEET 63  
 FOR -Y13RPC- PROFILE, SEE SHEET 64

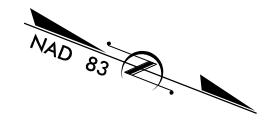
MATCHLINE SHEET 5  
 -L- STA 846 + 25.00

8/17/99

11/3/2018 14700A\_HYD\_PRR\_PSH\_04.dgn

8/17/99

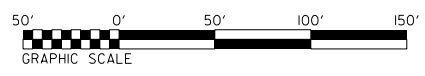
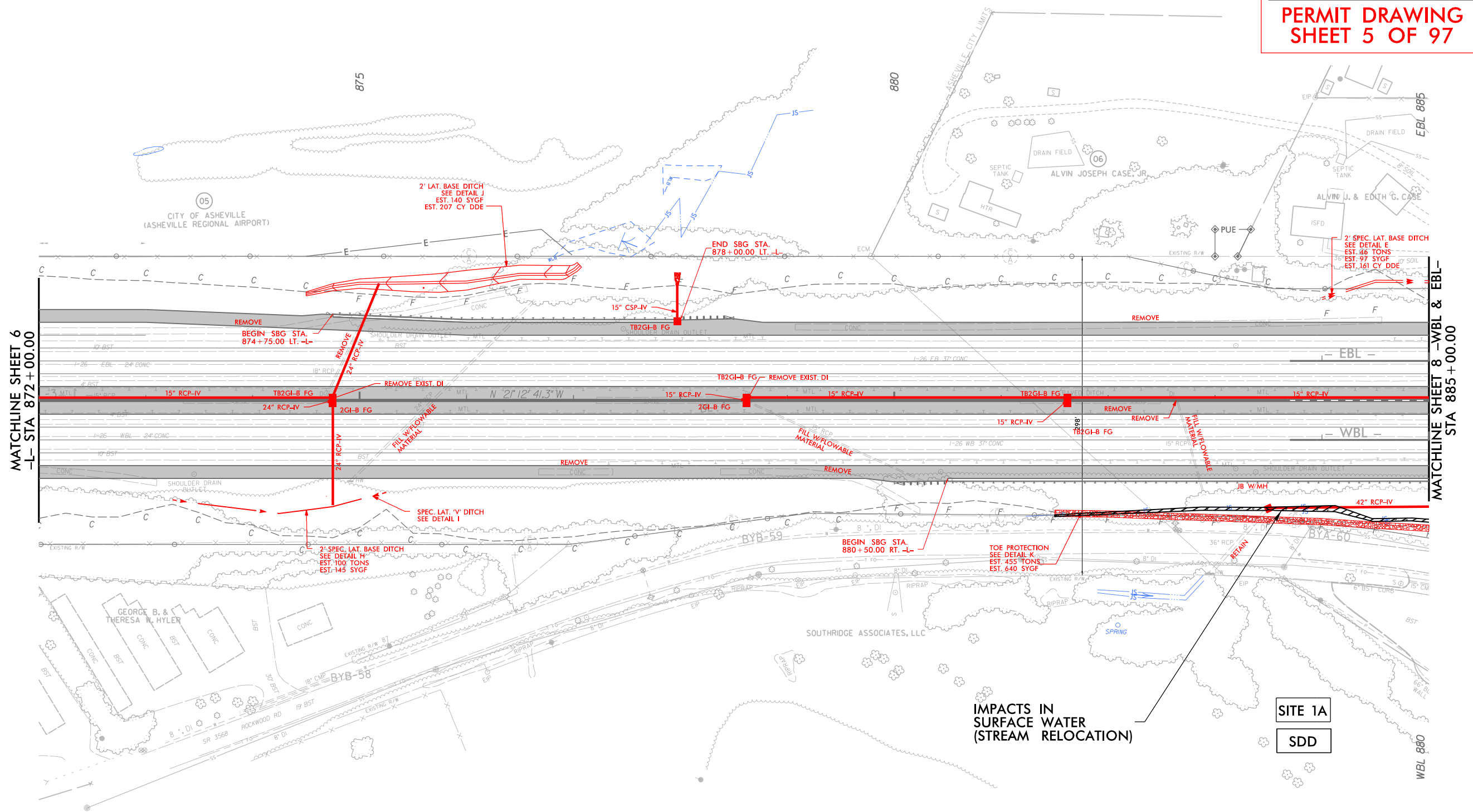
PROJECT REFERENCE NO. 1-4700	SHEET NO. 7
RW SHEET NO. 1-4700A - 18	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



# WETLAND & STREAM IMPACTS

**LEGEND**  
 DENOTES IMPACTS IN SURFACE WATER

**PERMIT DRAWING  
SHEET 5 OF 97**



**IMPACTS IN SURFACE WATER  
(STREAM RELOCATION)**

**SITE 1A**  
**SDD**

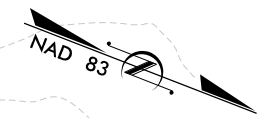
FOR - L - PROFILE, SEE SHEET 38 & 39  
 FOR - EBL - PROFILE, SEE SHEET 39  
 FOR - WBL - PROFILE, SEE SHEET 39

11/13/2008  
 1-4700A-HYD\_PRM\_PSH\_07.dgn  
 HNTB

8/17/99

HNTB HNTB NORTH CAROLINA, P.C.  
REGISTERED PROFESSIONAL ENGINEERS  
NO. 12828 AND NO. 12829  
NO. 12828 AND NO. 12829

PROJECT REFERENCE NO.	SHEET NO.
1-4700	7
RW SHEET NO.	1-4700A - 18
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



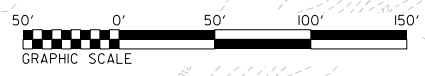
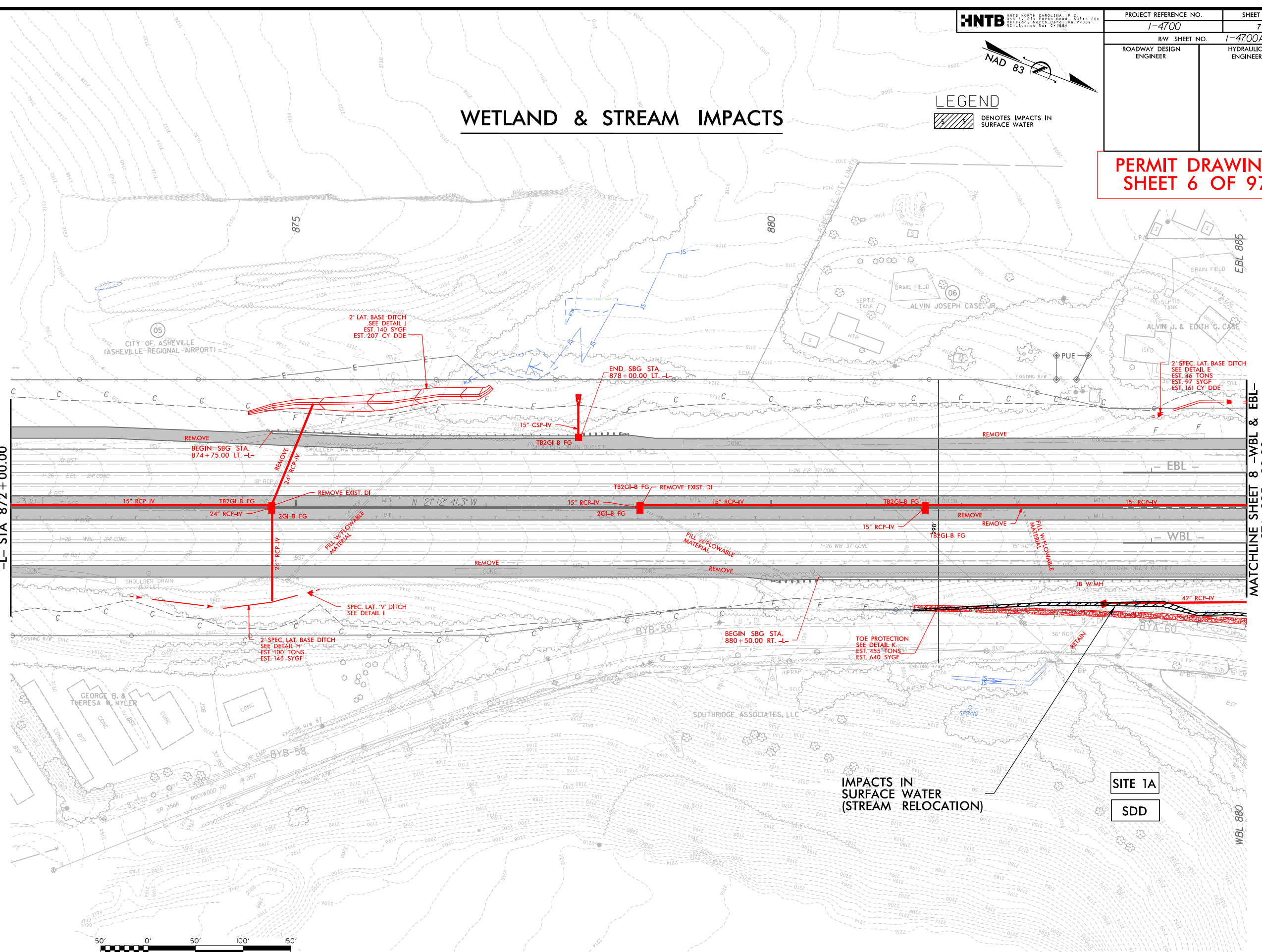
# WETLAND & STREAM IMPACTS

LEGEND  
 DENOTES IMPACTS IN SURFACE WATER

**PERMIT DRAWING  
SHEET 6 OF 97**

MATCHLINE SHEET 6  
-L- STA 872+00.00

MATCHLINE SHEET 8 -WBL & EBL-  
STA 885+00.00



IMPACTS IN SURFACE WATER (STREAM RELOCATION)  
 SITE 1A  
 SDD

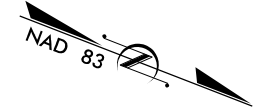
FOR - L - PROFILE, SEE SHEET 38 & 39  
 FOR - EBL - PROFILE, SEE SHEET 39  
 FOR - WBL - PROFILE, SEE SHEET 39

11/13/2018  
 1-4700A-HYD\_PRR\_PSH\_07.dgn  
 HNTB

8/17/99



PROJECT REFERENCE NO.	SHEET NO.
1-4700	8
R/W SHEET NO.	1-4700A - 19
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

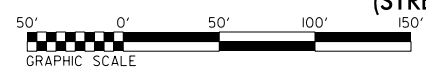
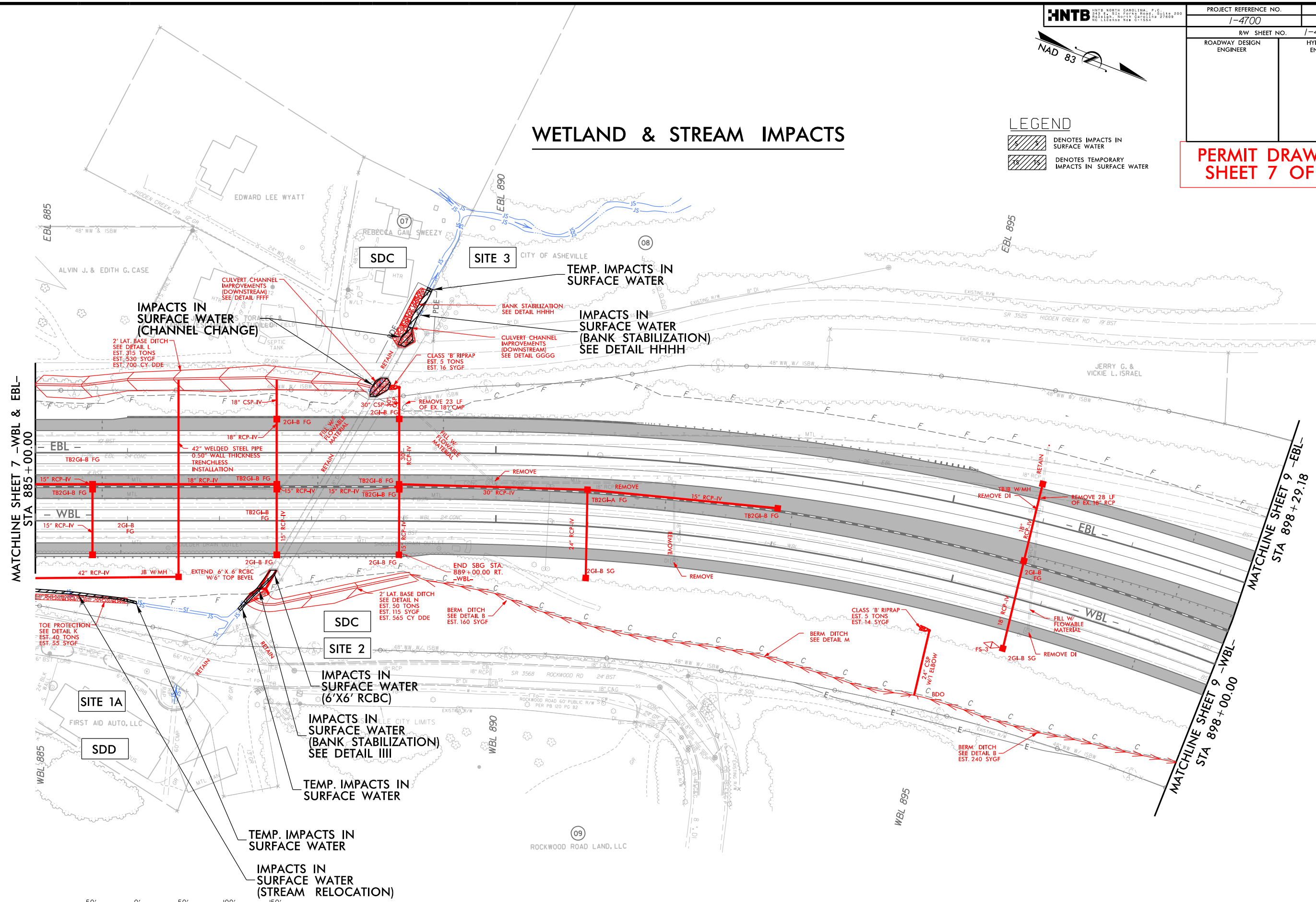


# WETLAND & STREAM IMPACTS

**LEGEND**

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

**PERMIT DRAWING SHEET 7 OF 97**



FOR - EBL - PROFILE, SEE SHEET 39 & 40  
 FOR - WBL - PROFILE, SEE SHEET 39 & 40  
 FOR RETAINING WALL -RW3-, SEE SHEET W-2

11/3/2008 11:47:00A\_HYD\_PRM\_PSH\_08.dgn

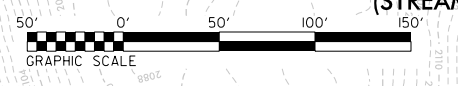
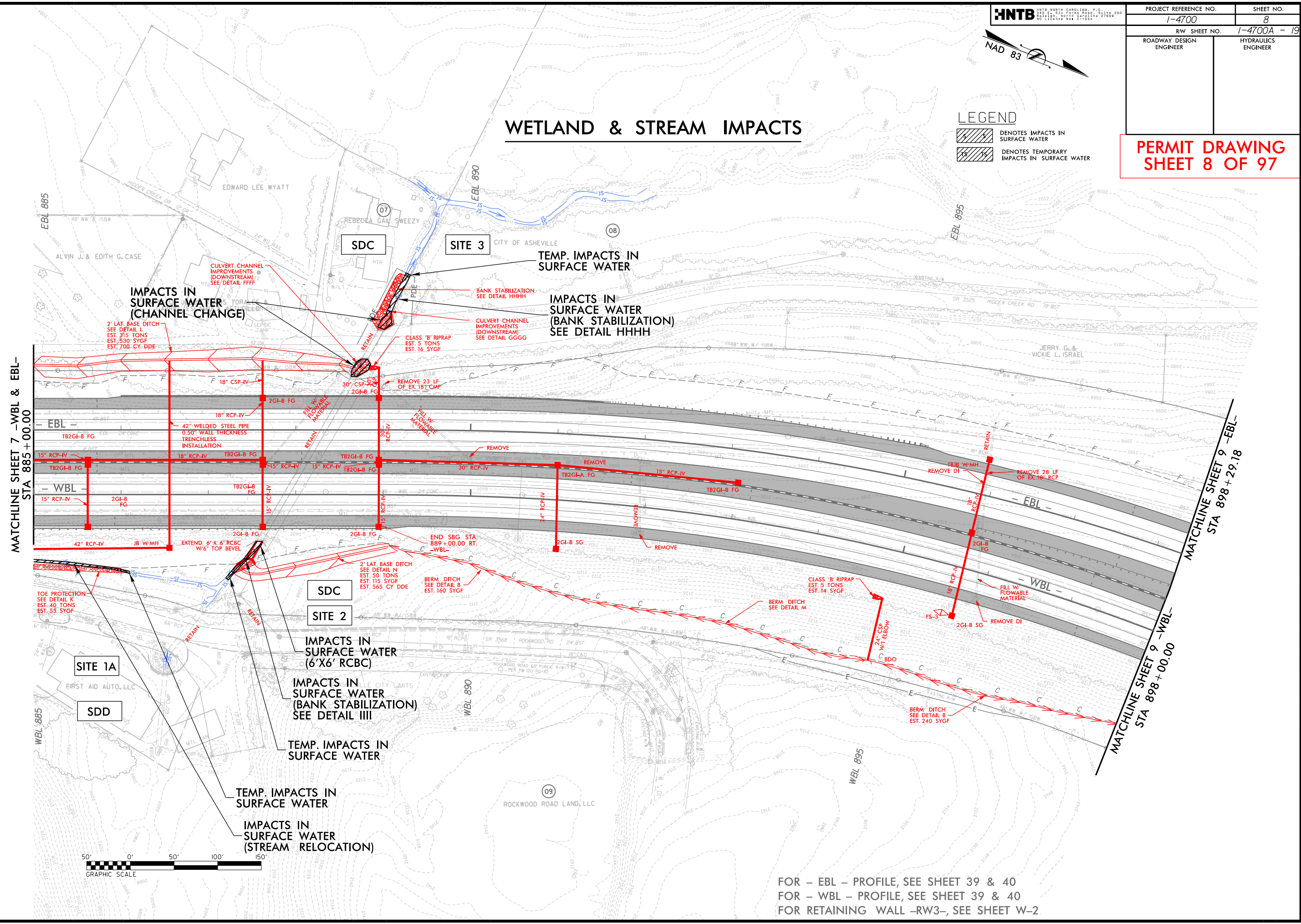
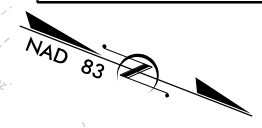
PROJECT REFERENCE NO.	SHEET NO.
1-4700	8
RW SHEET NO.	1-4700A - 19
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

**PERMIT DRAWING  
 SHEET 8 OF 97**

# WETLAND & STREAM IMPACTS

**LEGEND**

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

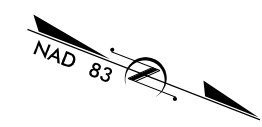


FOR - EBL - PROFILE, SEE SHEET 39 & 40  
 FOR - WBL - PROFILE, SEE SHEET 39 & 40  
 FOR RETAINING WALL -RW3-, SEE SHEET W-2

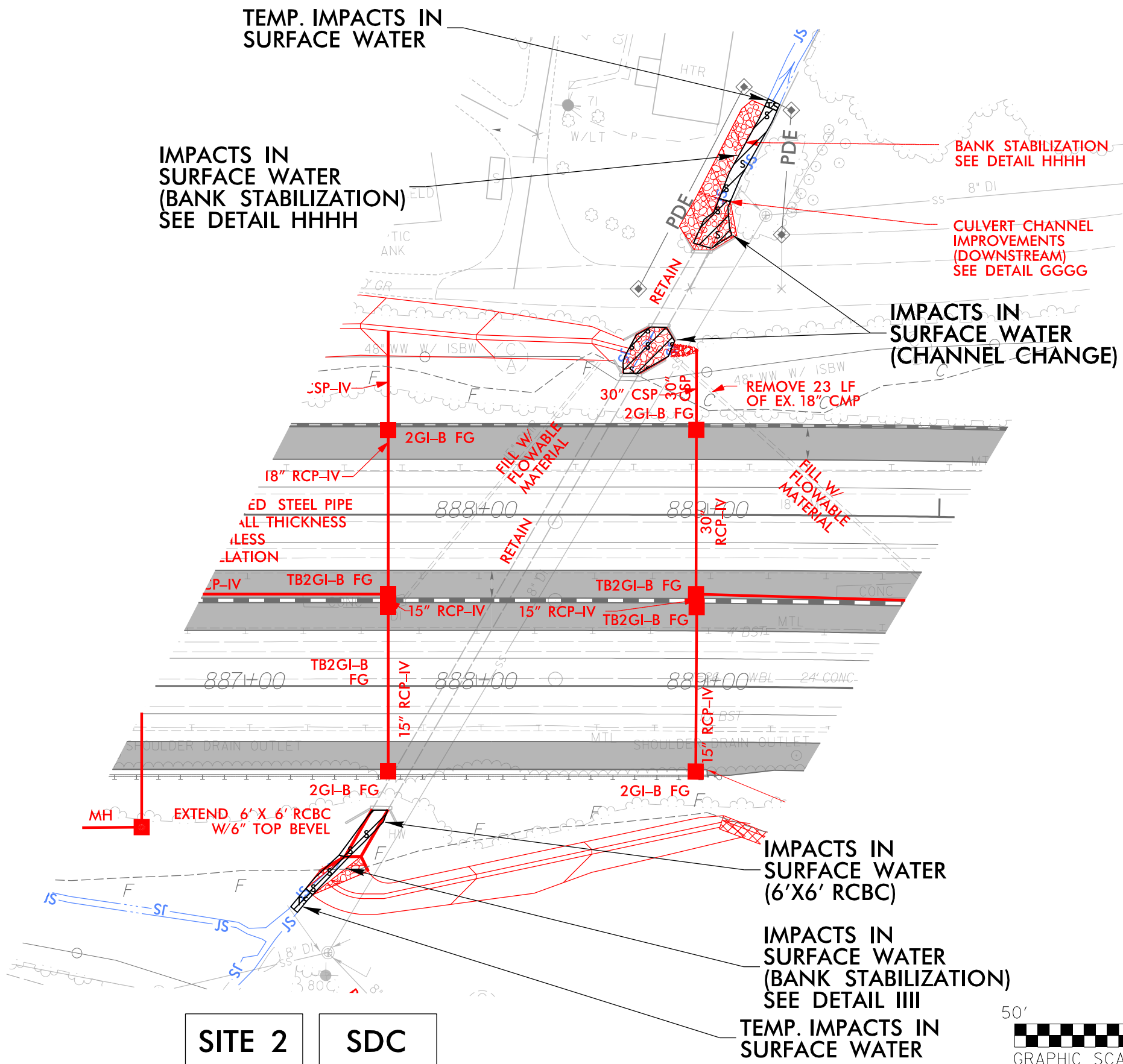
8/17/99  
 11/3/2008  
 1-4700A-HYD\_PSH\_08.dgn  
 HNTB

PROJECT REFERENCE NO.	SHEET NO.
1-4700	8
RW SHEET NO.	1-4700A - 19
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

**SITE 3**   **SDC**

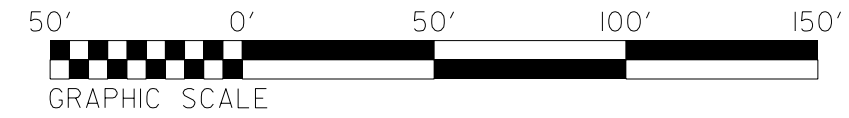


**PERMIT DRAWING**  
**SHEET 9 OF 97**



**LEGEND**

	DENOTES IMPACTS IN SURFACE WATER
	DENOTES TEMPORARY IMPACTS IN SURFACE WATER



**SITE 2**   **SDC**

PROJECT REFERENCE NO.	SHEET NO.
1-4700	8
RW SHEET NO.	1-4700A - 19
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

SITE 3 SDC

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL HHHH

BANK STABILIZATION SEE DETAIL HHHH

CULVERT CHANNEL IMPROVEMENTS (DOWNSTREAM) SEE DETAIL GGGG

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

LEGEND

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

REMOVE 23 LF OF EX. 18" CMP

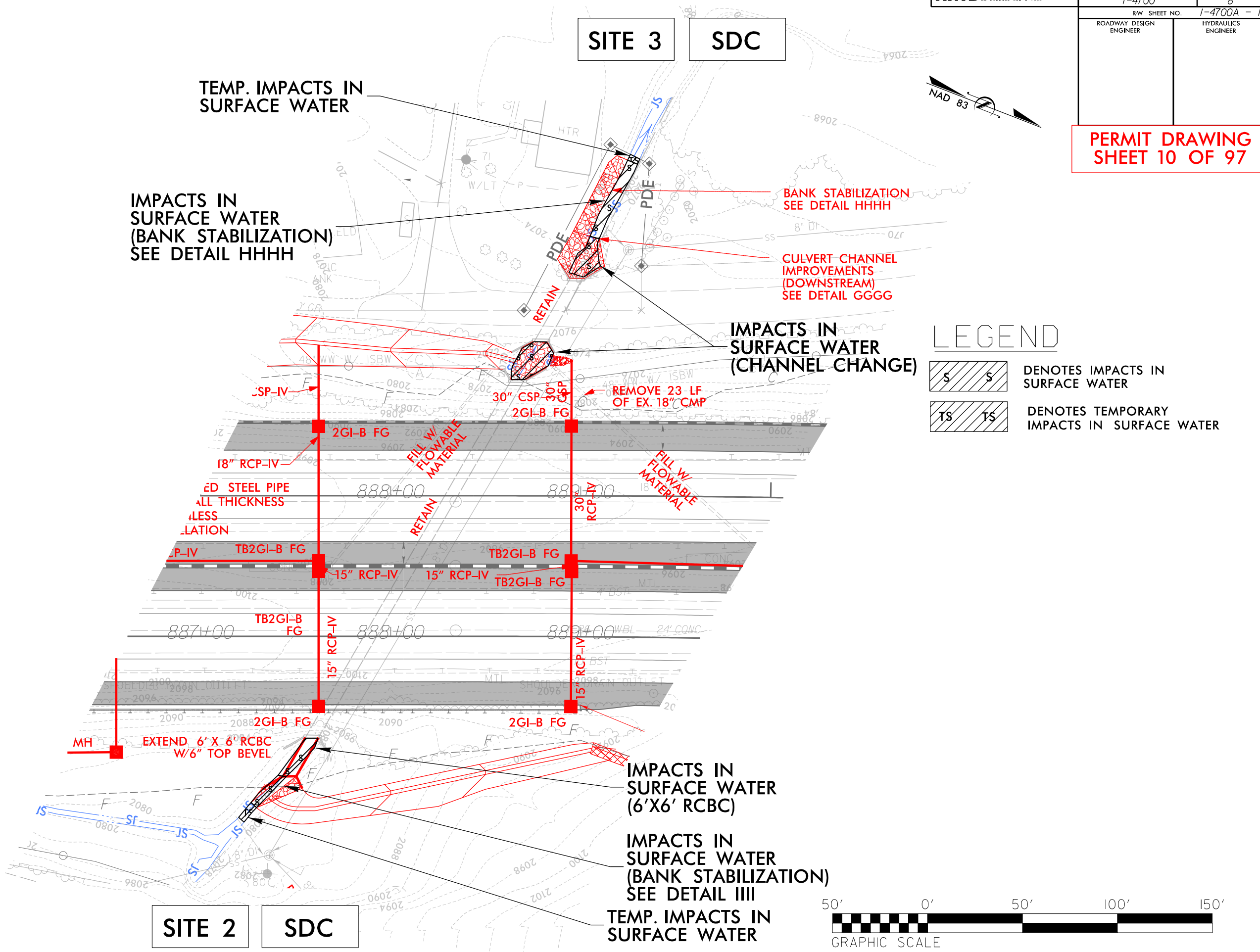
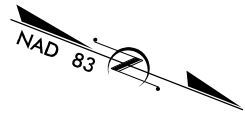
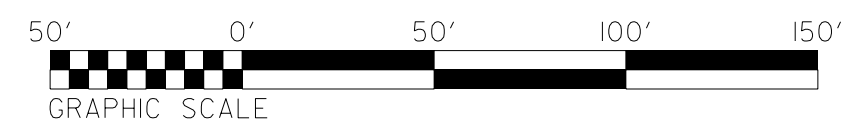
MH EXTEND 6' X 6' RCBC W/6" TOP BEVEL

IMPACTS IN SURFACE WATER (6'X6' RCBC)

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL IIII

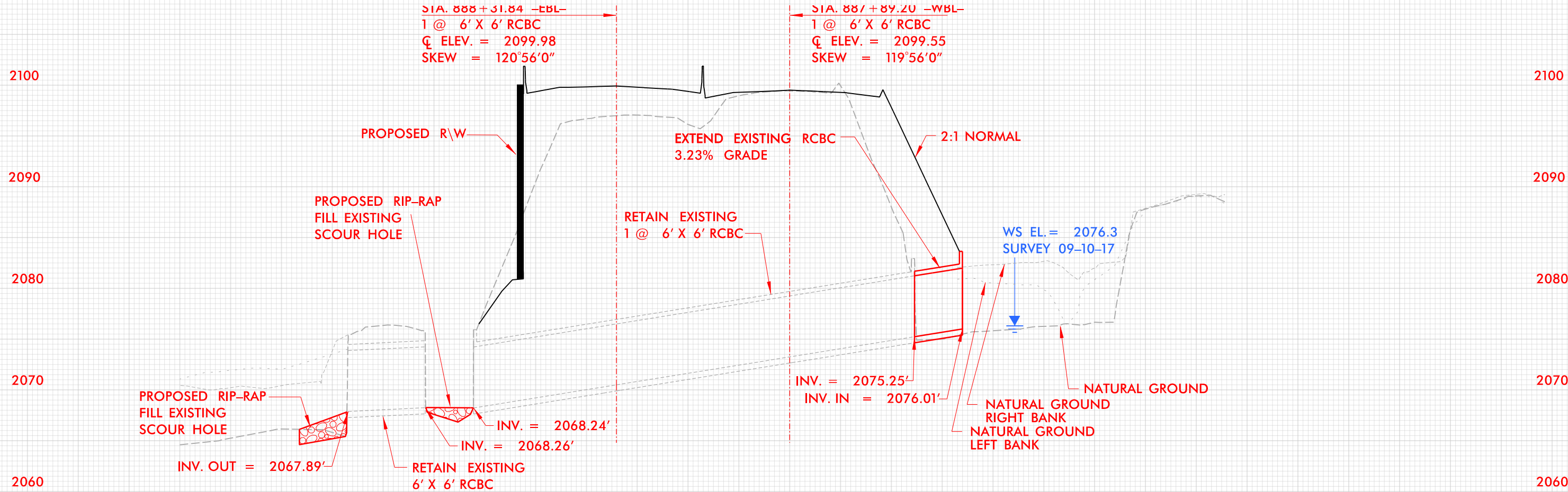
TEMP. IMPACTS IN SURFACE WATER

SITE 2 SDC



6/23/16

250 200 150 100 50 0 50 100 150 200 250



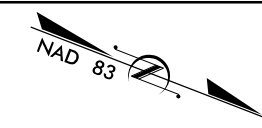
**PROFILE**

11/13/2016 11:15:15 AM I:\16700A\_HYD\_PRM\_PSH\_08B\_PFL.dgn

BUNCOMBE & HENDERSON COUNTY  
 PROJECT: I-4700  
 I-26  
 FROM 0.3 MI EAST OF NC 280 (AIRPORT RD.)  
 TO 0.5 MI EAST OF NC 191 (BREVARD RD.)

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
1-4700	10
RW SHEET NO.	1-4700A - 21
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

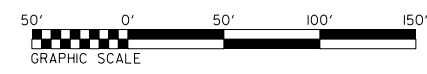
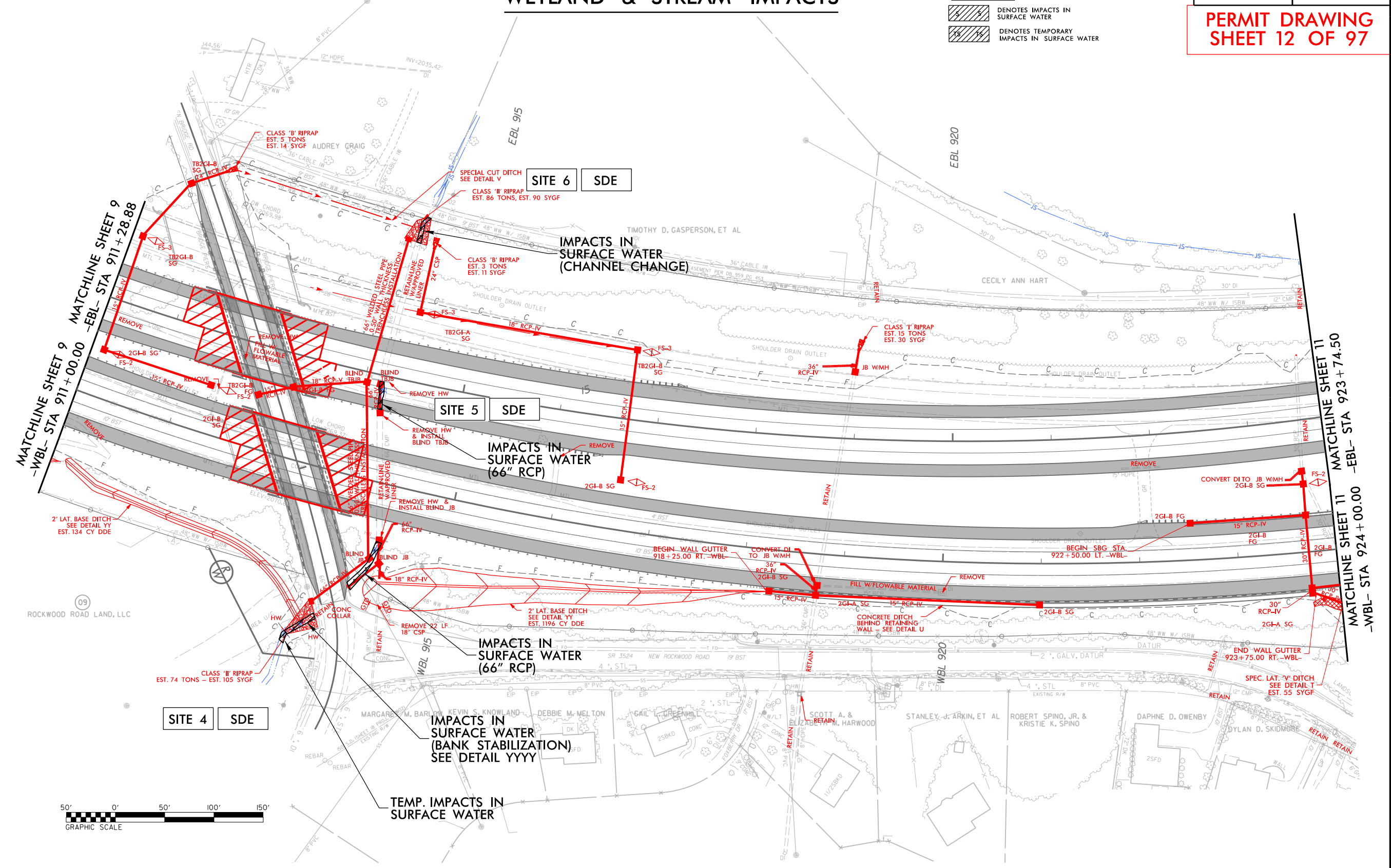


**PERMIT DRAWING  
SHEET 12 OF 97**

# WETLAND & STREAM IMPACTS

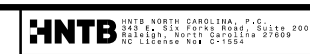
**LEGEND**

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



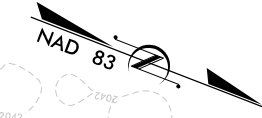
11/14/2018 11:47:08A\_HYD\_PSH\_10.dgn

8/17/99



PROJECT REFERENCE NO.	SHEET NO.
1-4700	10
RW SHEET NO.	1-4700A - 21
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

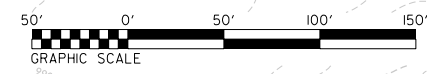
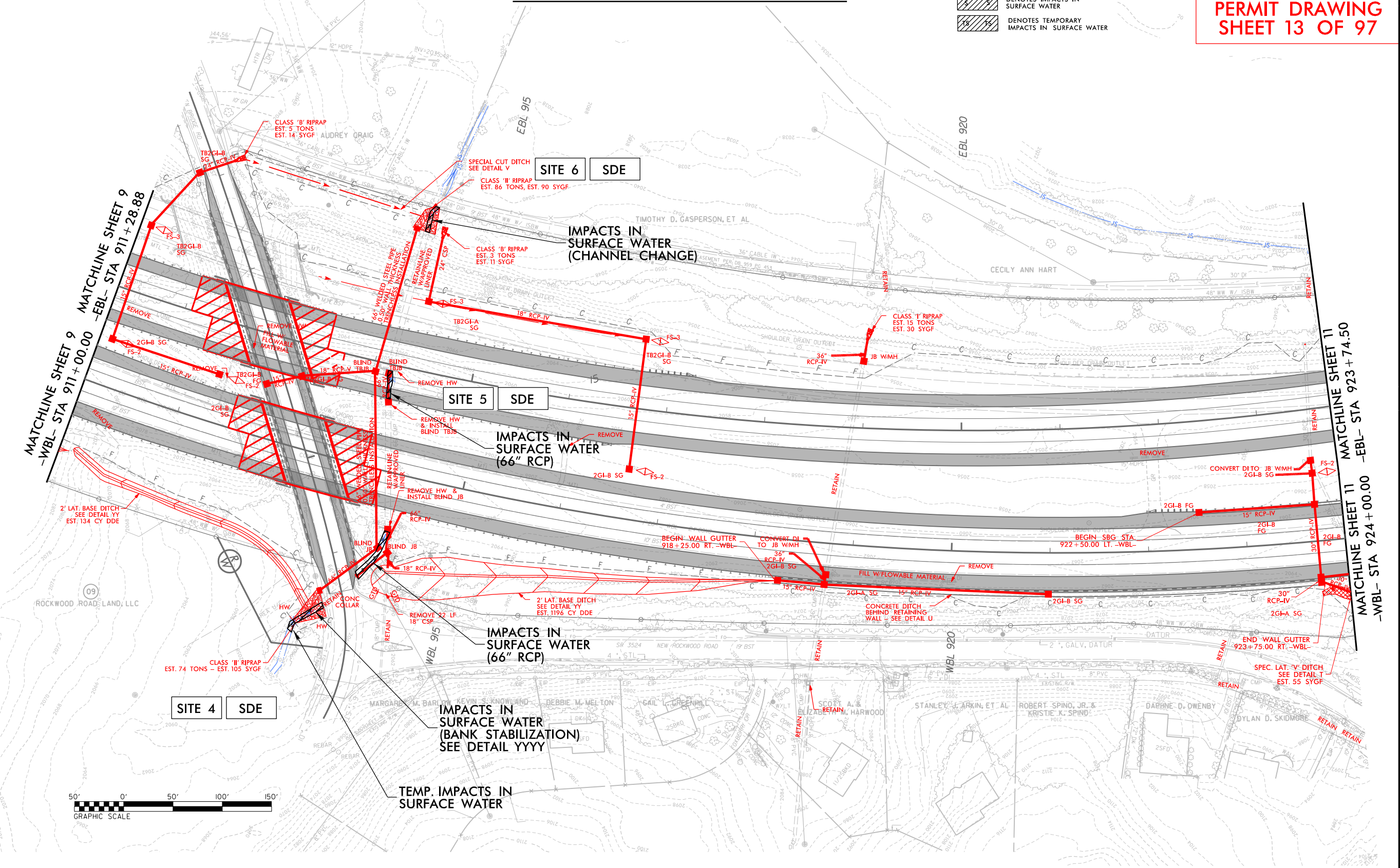
**PERMIT DRAWING**  
**SHEET 13 OF 97**



# WETLAND & STREAM IMPACTS

**LEGEND**

	DENOTES IMPACTS IN SURFACE WATER
	DENOTES TEMPORARY IMPACTS IN SURFACE WATER



11/14/2008  
1-4700A-HYD\_PSH\_10.dgn  
HNTB

PROJECT REFERENCE NO. 1-4700	SHEET NO. 10
RW SHEET NO. 1-4700A - 21	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

**PERMIT DRAWING  
SHEET 14 OF 97**

**SITE 6 SDE**

**CLASS 'II' RIPRAP  
EST. 86 TONS, EST. 90 SYGF  
(NO RIP-RAP IS TO BE PLACED IN STREAM BED)**

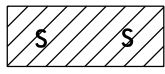

**IMPACTS IN  
SURFACE WATER  
(BANK STABILIZATION)  
SEE DETAIL YYYY**

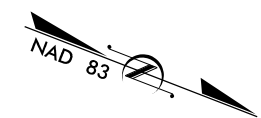
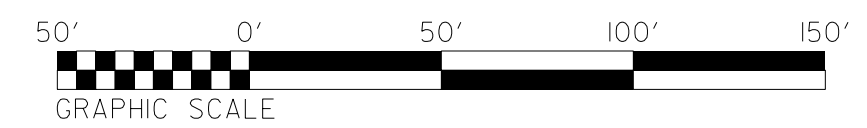
**CLASS 'B' RIPRAP  
EST. 3 TONS  
EST. 11 SYGF**

**IMPACTS IN  
SURFACE WATER  
66" RCP**

**SITE 5 SDE**

**LEGEND**

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



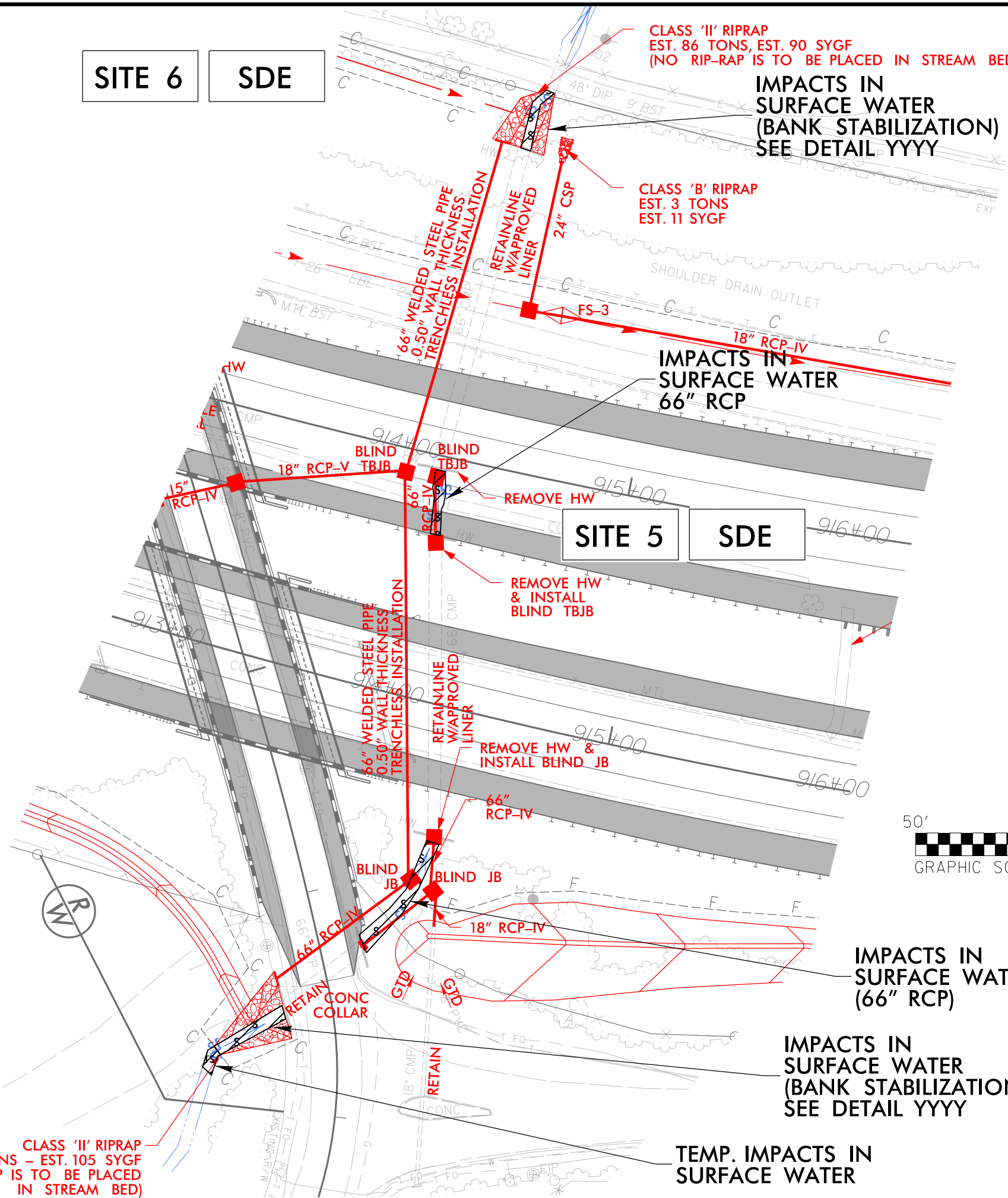
**SITE 4 SDE**

**CLASS 'II' RIPRAP  
EST. 74 TONS - EST. 105 SYGF  
(NO RIP-RAP IS TO BE PLACED  
IN STREAM BED)**

**IMPACTS IN  
SURFACE WATER  
(66" RCP)**

**IMPACTS IN  
SURFACE WATER  
(BANK STABILIZATION)  
SEE DETAIL YYYY**

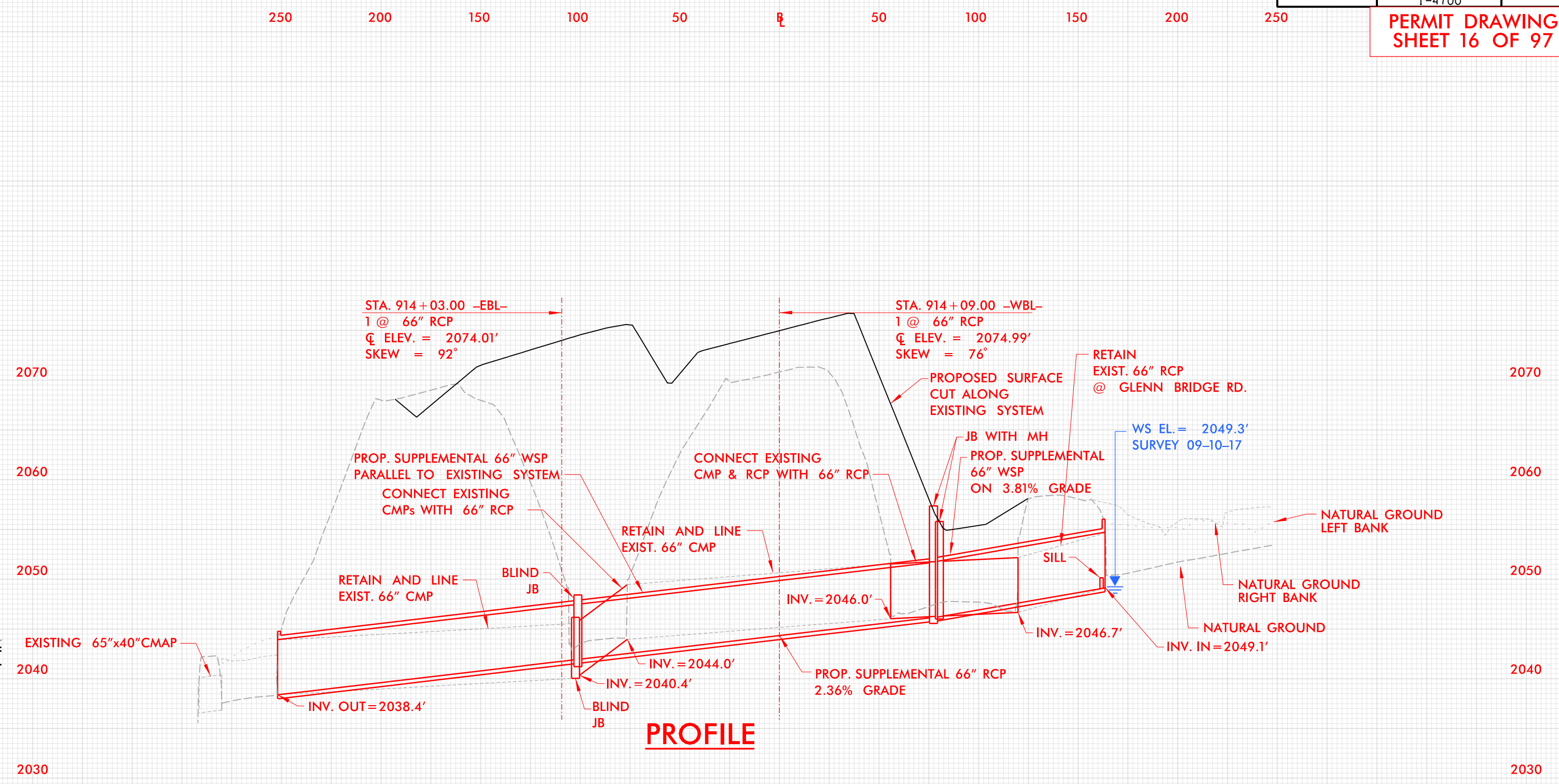
**TEMP. IMPACTS IN  
SURFACE WATER**





6/23/16

**PERMIT DRAWING  
SHEET 16 OF 97**



**PROFILE**

11/13/2016  
11:15:15  
I:\13\2016  
11/13/2016  
I-4700A\_HYD\_PRM\_PSH\_10B\_PFL.dgn  
HNTB

BUNCOMBE & HENDERSON COUNTY  
PROJECT: I-4700  
I-26  
FROM 0.3 MI EAST OF NC 280 (AIRPORT RD.)  
TO 0.5 MI EAST OF NC 191 (BREVARD RD.)

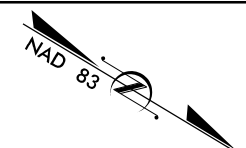
8/17/99



PROJECT REFERENCE NO.	SHEET NO.
1-4700	11
RW SHEET NO.	1-4700A-22
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

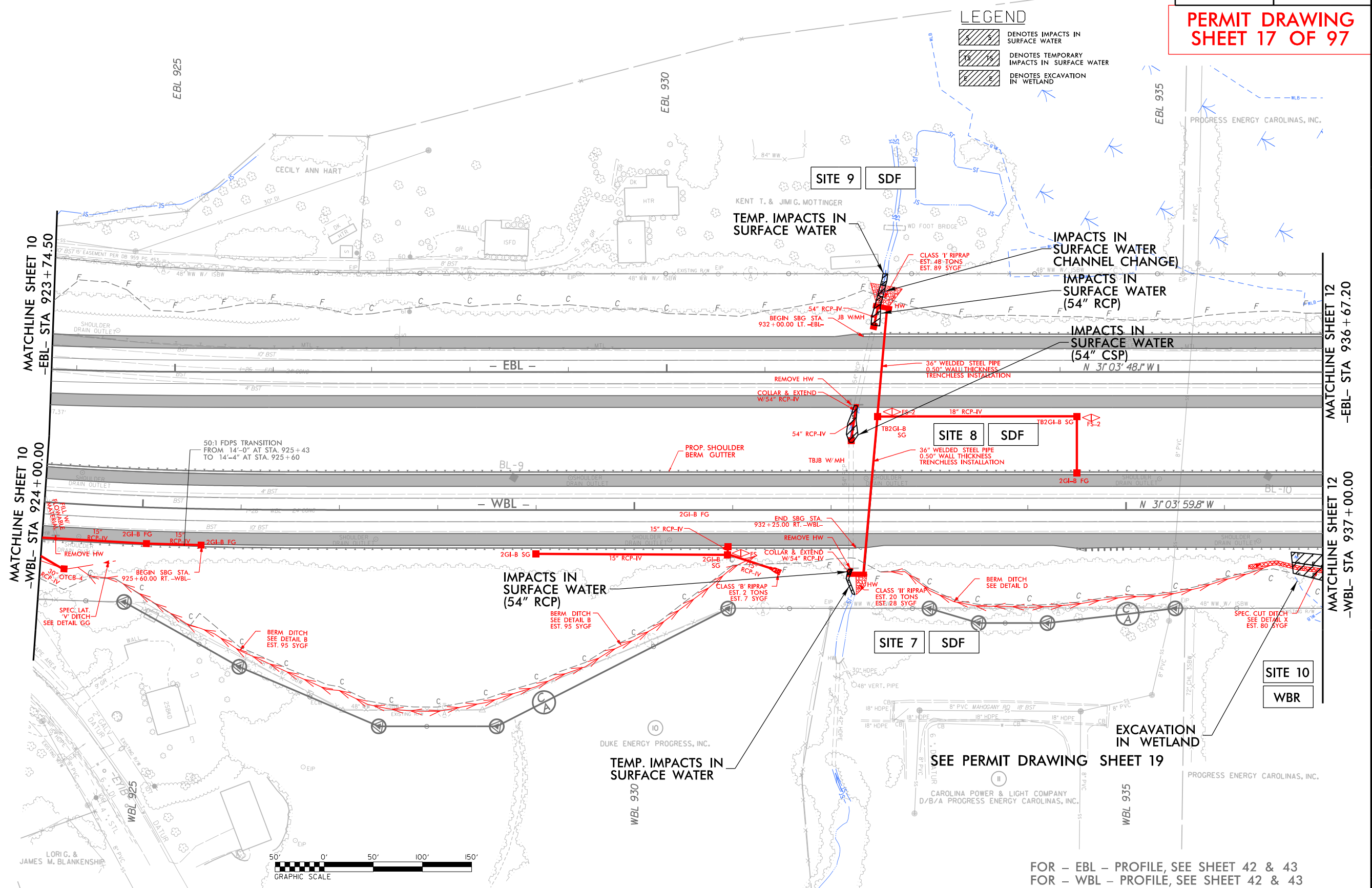
**PERMIT DRAWING SHEET 17 OF 97**

# WETLAND & STREAM IMPACTS



**LEGEND**

	DENOTES IMPACTS IN SURFACE WATER
	DENOTES TEMPORARY IMPACTS IN SURFACE WATER
	DENOTES EXCAVATION IN WETLAND

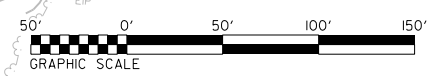


MATCHLINE SHEET 10  
-EBL- STA 923+74.50

MATCHLINE SHEET 10  
-WBL- STA 924+00.00

MATCHLINE SHEET 12  
-EBL- STA 936+67.20

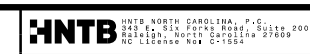
MATCHLINE SHEET 12  
-WBL- STA 937+00.00



FOR - EBL - PROFILE, SEE SHEET 42 & 43  
 FOR - WBL - PROFILE, SEE SHEET 42 & 43

11/14/2008 11:47:00A\_HYD\_PSH\_11.dgn

8/17/99



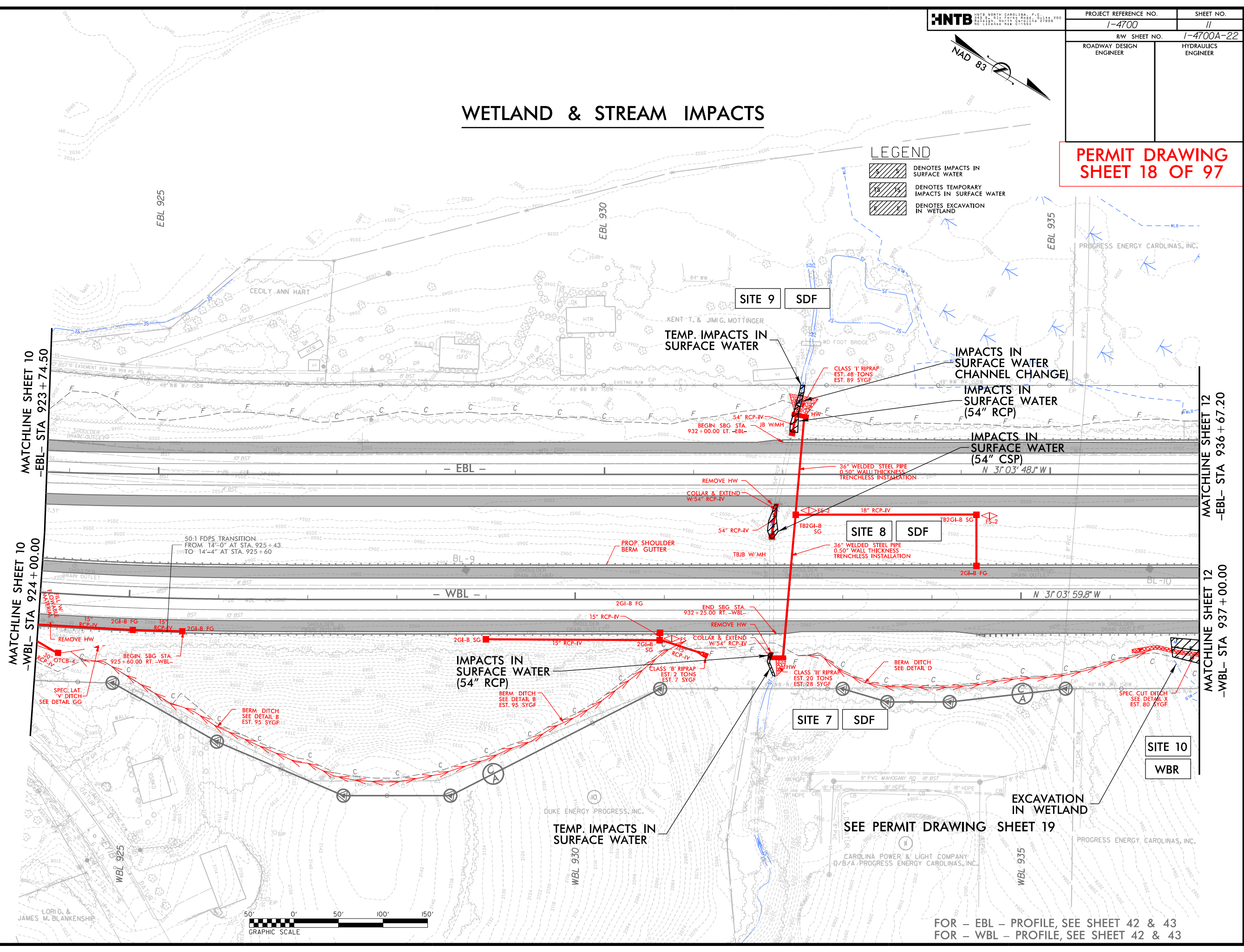
PROJECT REFERENCE NO. 1-4700	SHEET NO. 11
RW SHEET NO. 1-4700A-22	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

**PERMIT DRAWING SHEET 18 OF 97**

# WETLAND & STREAM IMPACTS

**LEGEND**

	DENOTES IMPACTS IN SURFACE WATER
	DENOTES TEMPORARY IMPACTS IN SURFACE WATER
	DENOTES EXCAVATION IN WETLAND

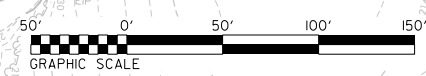


MATCHLINE SHEET 10  
-EBL- STA 923+74.50

MATCHLINE SHEET 10  
-WBL- STA 924+00.00

MATCHLINE SHEET 12  
-EBL- STA 936+67.20

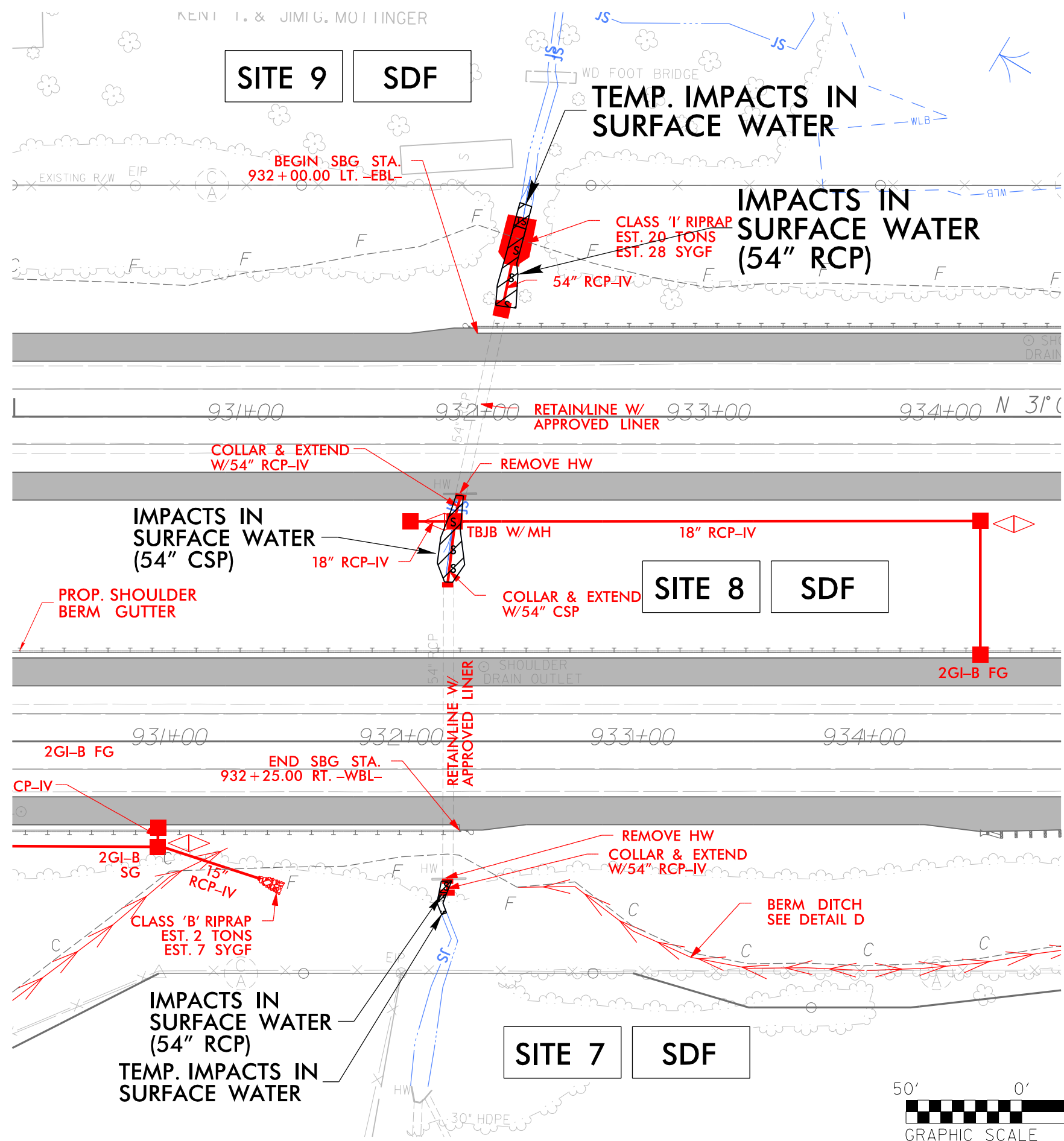
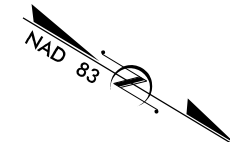
MATCHLINE SHEET 12  
-WBL- STA 937+00.00



FOR - EBL - PROFILE, SEE SHEET 42 & 43  
FOR - WBL - PROFILE, SEE SHEET 42 & 43


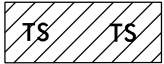

11/14/2008 11:47:00A\_HYD\_PSH\_11.dgn

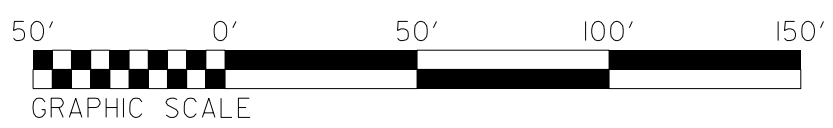
PROJECT REFERENCE NO. 1-4700	SHEET NO. 11
RW SHEET NO. 1-4700A-22	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



**PERMIT DRAWING  
SHEET 19 OF 97**

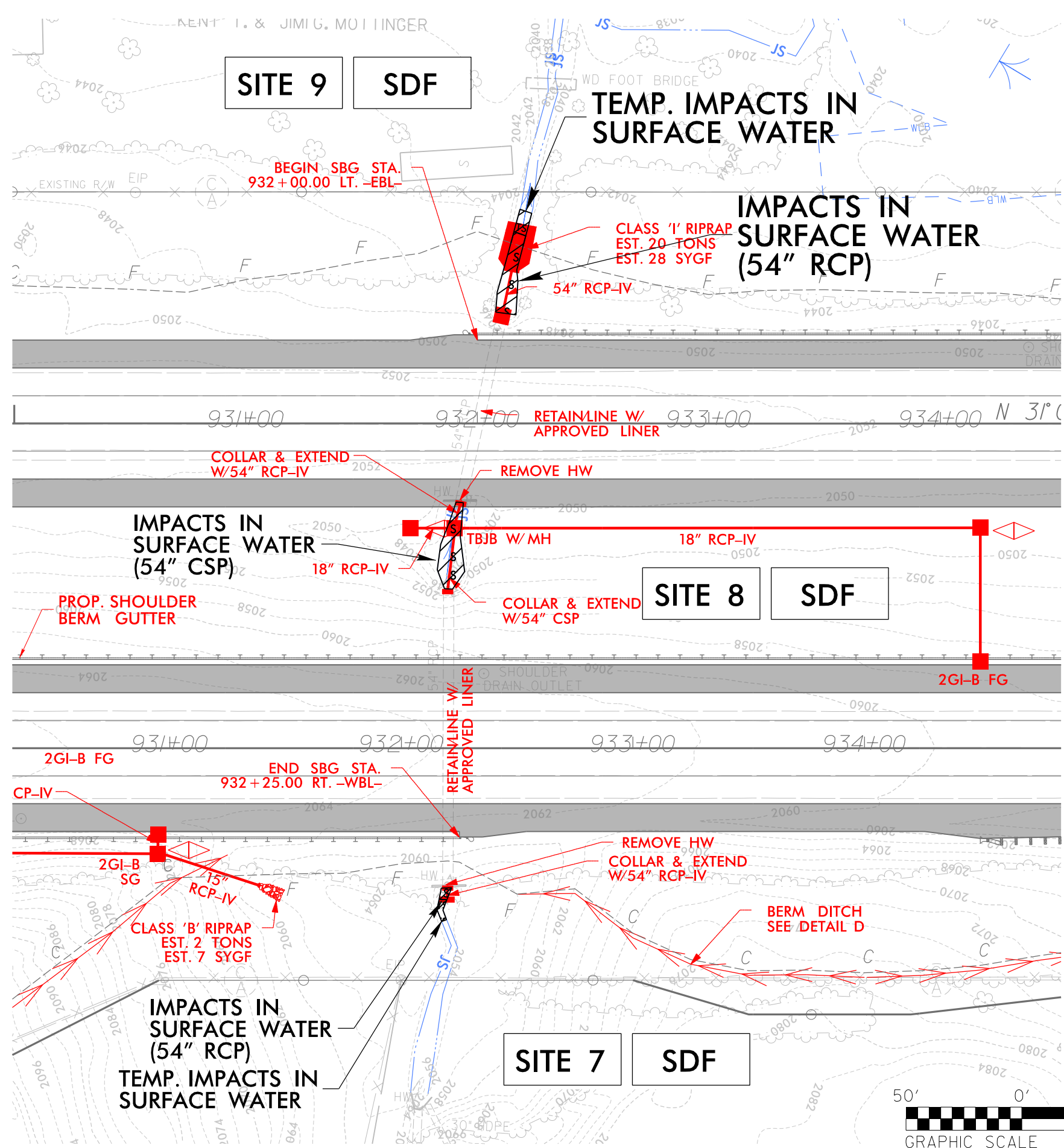
**LEGEND**

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



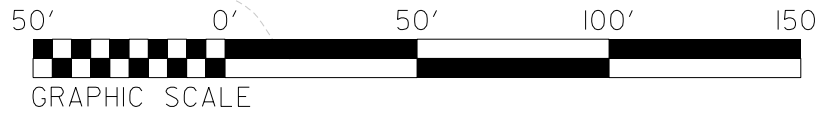
PROJECT REFERENCE NO. 1-4700	SHEET NO. 11
RW SHEET NO. 1-4700A-22	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

**PERMIT DRAWING  
SHEET 20 OF 97**



**LEGEND**

	DENOTES IMPACTS IN SURFACE WATER
	DENOTES TEMPORARY IMPACTS IN SURFACE WATER
	DENOTES EXCAVATION IN WETLAND

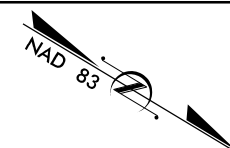


8/17/99



PROJECT REFERENCE NO.	SHEET NO.
1-4700	12
RW SHEET NO.	1-4700A-23
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

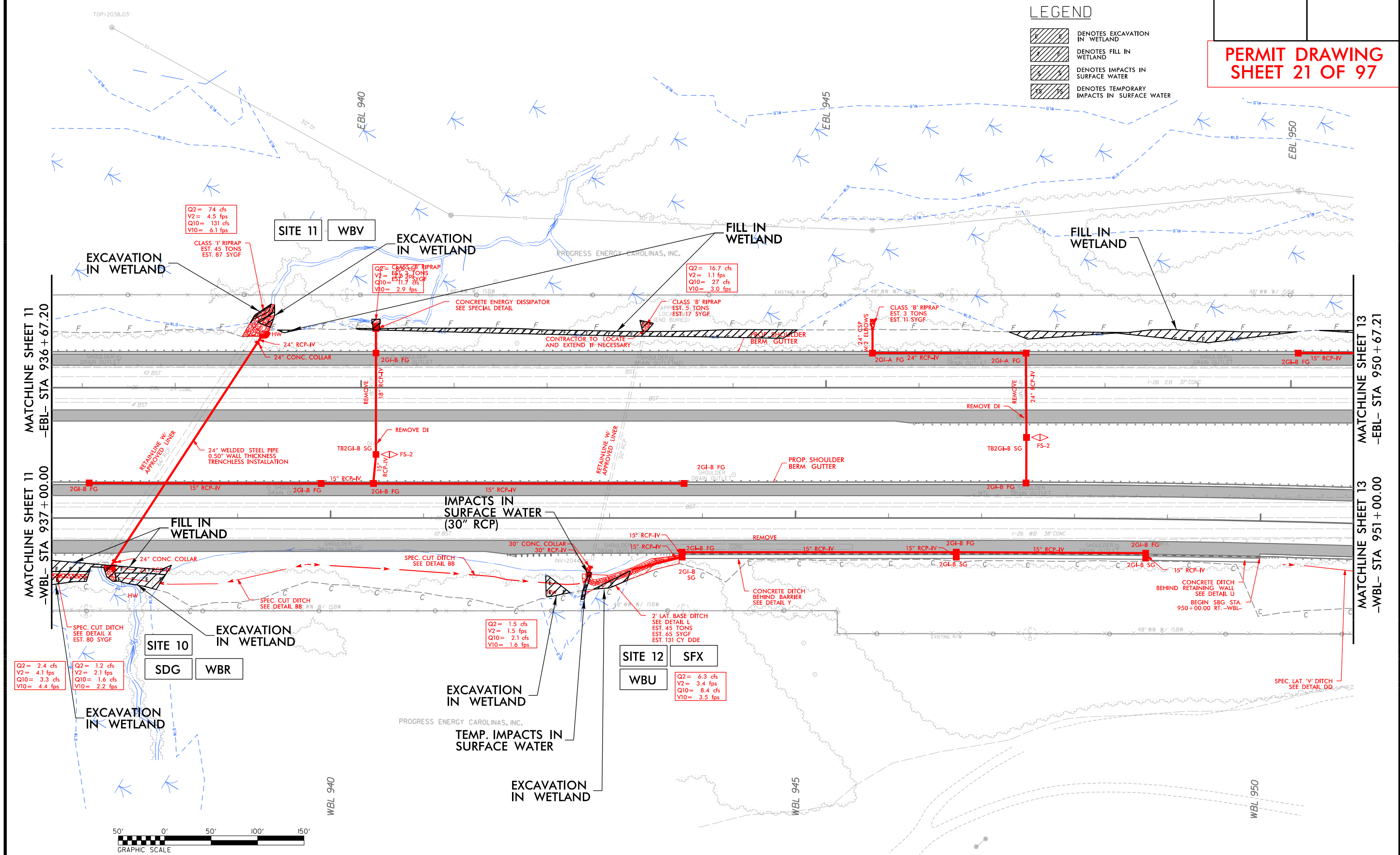
# WETLAND & STREAM IMPACTS



**LEGEND**

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

**PERMIT DRAWING SHEET 21 OF 97**



Q2 = 2.4 cfs  
V2 = 4.1 fps  
Q10 = 3.3 cfs  
V10 = 4.4 fps

Q2 = 1.2 cfs  
V2 = 2.1 fps  
Q10 = 1.6 cfs  
V10 = 2.2 fps

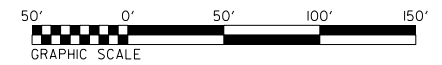
Q2 = 74 cfs  
V2 = 4.5 fps  
Q10 = 131 cfs  
V10 = 6.1 fps

Q2 = CLASS 'B' RIPRAP  
EST. 2 TONS  
V2 = 1.7 fps  
Q10 = 2.9 cfs  
V10 = 2.9 fps

Q2 = 16.7 cfs  
V2 = 1.1 fps  
Q10 = 27 cfs  
V10 = 3.0 fps

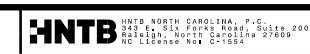
Q2 = 1.5 cfs  
V2 = 1.5 fps  
Q10 = 2.1 cfs  
V10 = 1.6 fps

Q2 = 6.3 cfs  
V2 = 3.4 fps  
Q10 = 8.4 cfs  
V10 = 3.5 fps

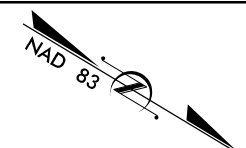


11/14/2008 14700A\_HYD\_PSH\_12.dgn

8/17/99



PROJECT REFERENCE NO.	SHEET NO.
1-4700	12
RW SHEET NO.	1-4700A-23
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

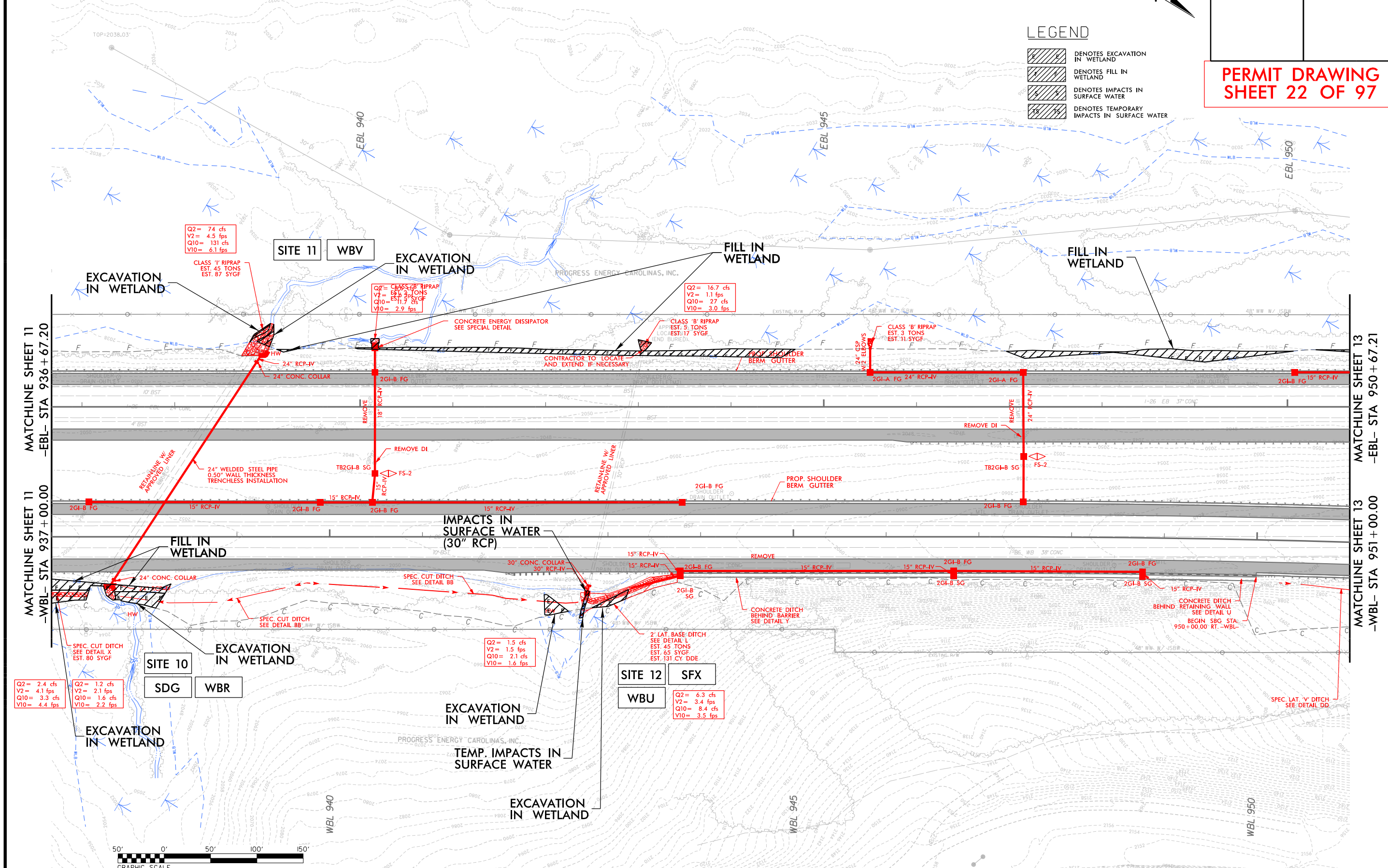


# WETLAND & STREAM IMPACTS

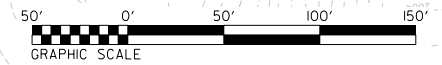
**LEGEND**

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

**PERMIT DRAWING SHEET 22 OF 97**



11/14/2008 14700A\_HYD\_PRM\_PSH\_12.dgn

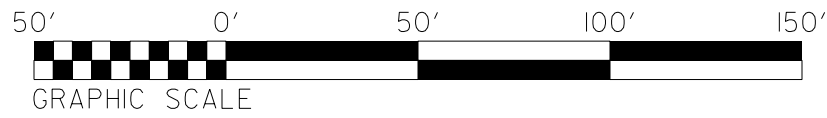


MATCHLINE SHEET 11  
-WBL- STA 937 + 00.00

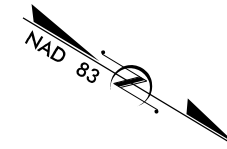
MATCHLINE SHEET 11  
-EBL- STA 936 + 67.20

MATCHLINE SHEET 13  
-WBL- STA 951 + 00.00

MATCHLINE SHEET 13  
-EBL- STA 950 + 67.21

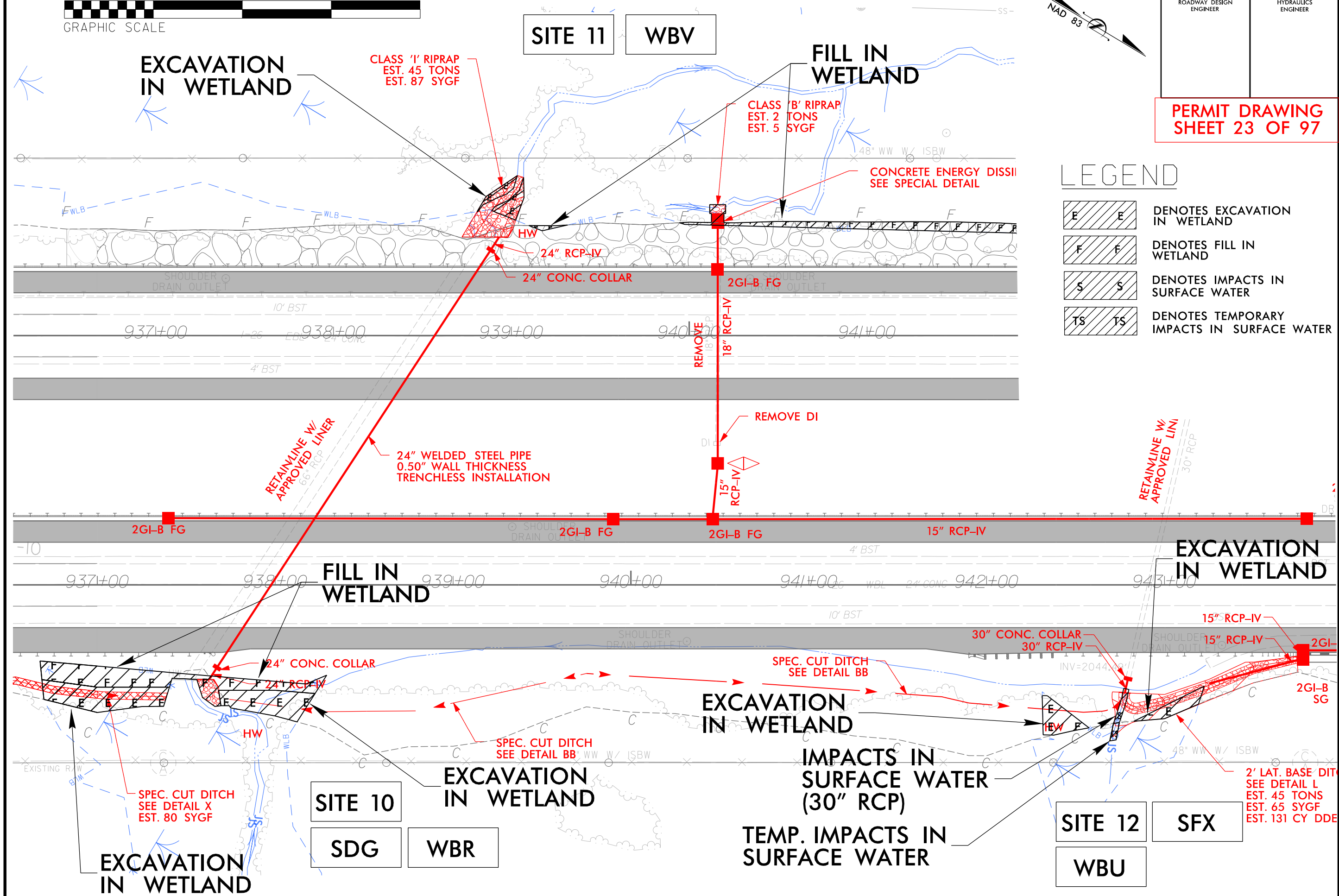


**HNTB**  
HNTB NORTH CAROLINA, P.C.  
1000 W. 10TH STREET, SUITE 200  
Raleigh, NC 27609  
Tel: 919.876.8000 Fax: 919.876.8001




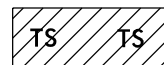


PROJECT REFERENCE NO. 1-4700	SHEET NO. 11 & 12
RW SHEET NO. 1-4700A-23	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

**PERMIT DRAWING  
SHEET 23 OF 97**



**LEGEND**

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

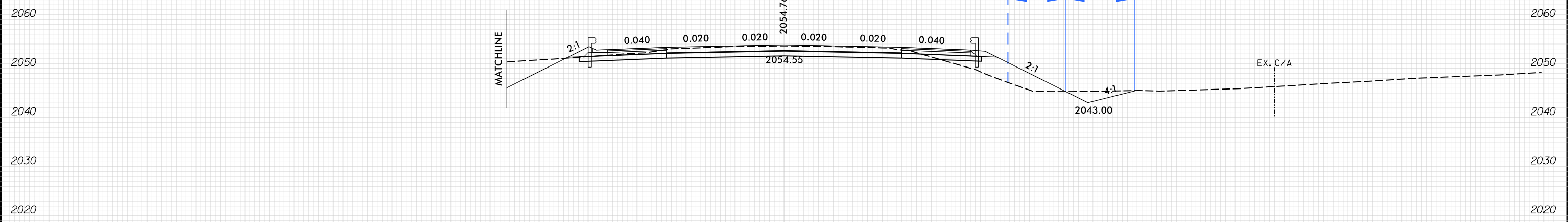
2' LAT. BASE DIT  
SEE DETAIL L  
EST. 45 TONS  
EST. 65 SYGF  
EST. 131 CY DDE



6/23/16

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

# WETLAND CROSS SECTIONS



**SITE 10**  
-WBL- 937 + 00.00

**SCALE**  
1"=20' HORIZONTAL  
1"=20' VERTICAL

BUNCOMBE & HENDERSON COUNTY  
PROJECT: I-4700  
I-26  
FROM 0.3 MI EAST OF NC 280 (AIRPORT RD.)  
TO 0.5 MI EAST OF NC 191 (BREVARD RD.)

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

11/13/2008  
14700A-HYD-PRM\_PSH\_XPL  
F:\118

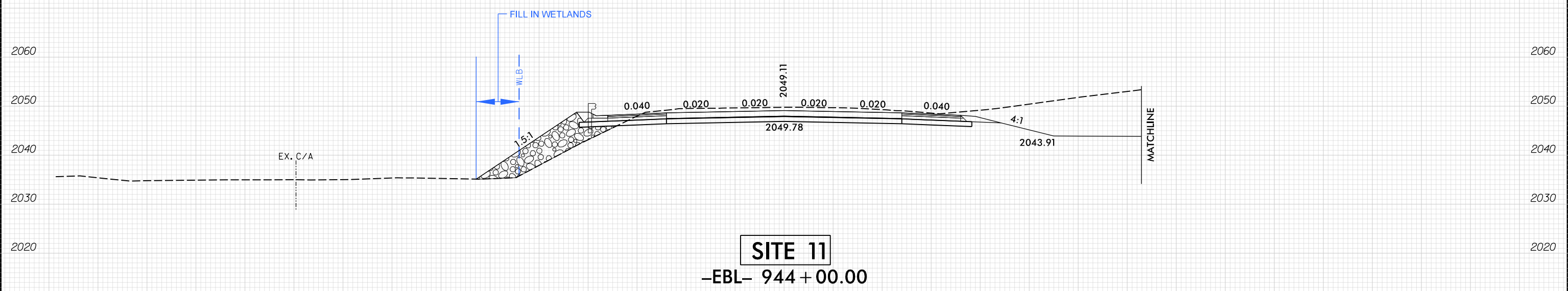
6/23/16

5	10	PROJ. REFERENCE NO.	SHEET NO.
		I-4700	

PERMIT DRAWING  
SHEET 26 OF 97

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

# WETLAND CROSS SECTIONS



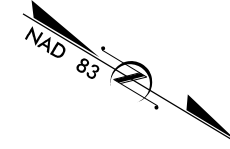
**SCALE**  
1"=20' HORIZONTAL  
1"=20' VERTICAL

BUNCOMBE & HENDERSON COUNTY  
PROJECT: I-4700  
I-26  
FROM 0.3 MI EAST OF NC 280 (AIRPORT RD.)  
TO 0.5 MI EAST OF NC 191 (BREVARD RD.)

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

11/13/2008  
14700A\_HYD\_PRM\_PSH\_XPL  
F:\11B

8/17/99

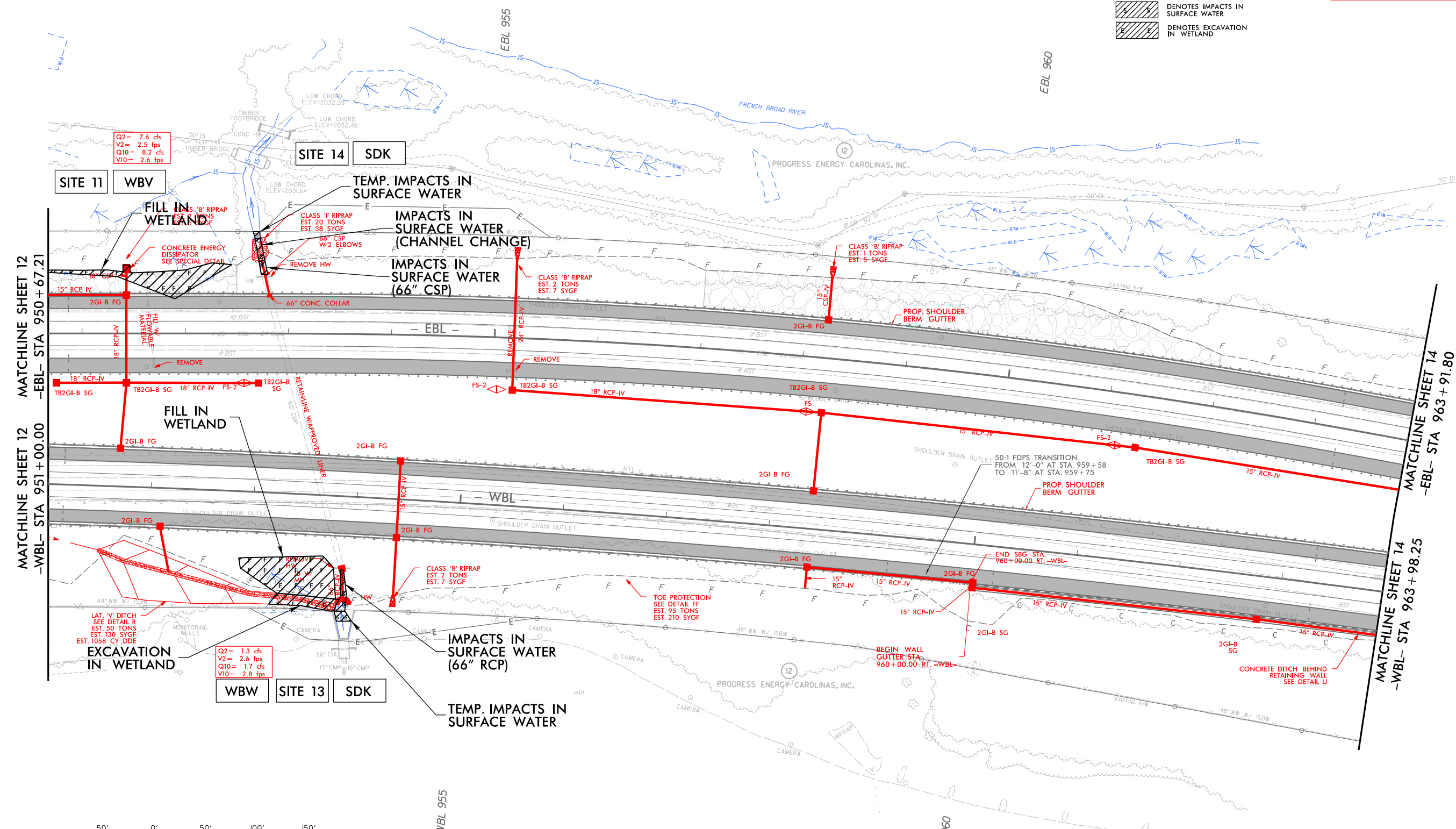


# WETLAND & STREAM IMPACTS

**LEGEND**

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

**PERMIT DRAWING  
SHEET 27 OF 97**

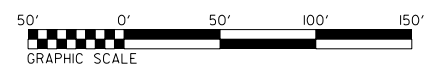


MATCHLINE SHEET 12  
-EBL- STA 950 + 67.21

MATCHLINE SHEET 12  
-WBL- STA 951 + 00.00

MATCHLINE SHEET 14  
-EBL- STA 963 + 91.80

MATCHLINE SHEET 14  
-WBL- STA 963 + 98.25



FOR - EBL - PROFILE, SEE SHEET 44 & 45  
FOR - WBL - PROFILE, SEE SHEET 44 & 45  
FOR RETAINING WALL -RW8-, SEE SHEET W-7

11/14/2008 1-4700A-HYD\_PRL\_PSH\_13.dgn

8/17/99

HNTB HNTB NORTH CAROLINA, P.C.  
300 N. 5th Street, Suite 200  
Raleigh, North Carolina 27601  
Tel: 919/978-1100 Fax: 919/978-1101

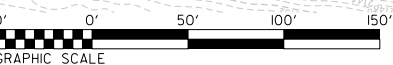
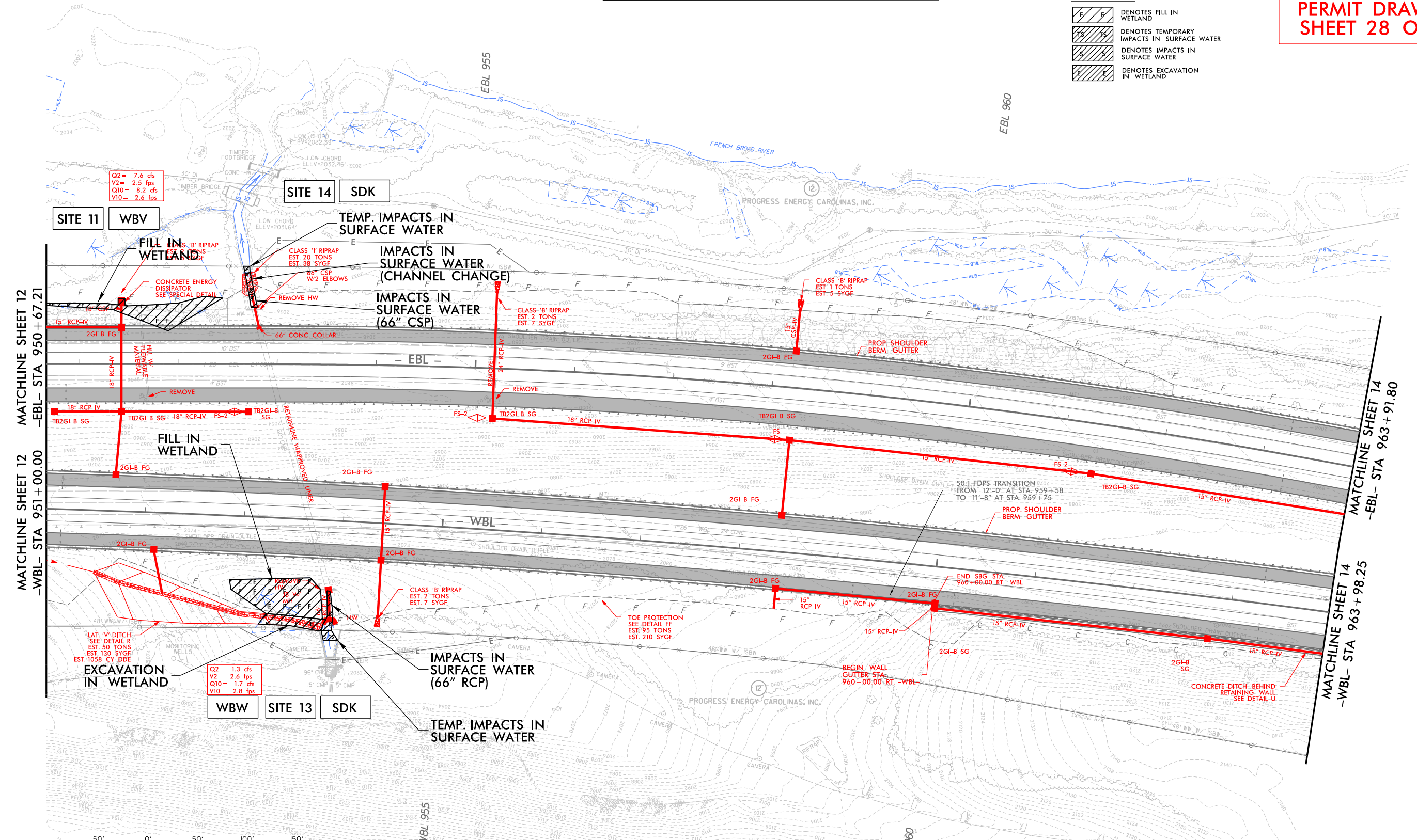
PROJECT REFERENCE NO. 1-4700	SHEET NO. 13
RW SHEET NO. 1-4700A-24	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

**PERMIT DRAWING  
SHEET 28 OF 97**

# WETLAND & STREAM IMPACTS

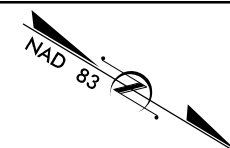
**LEGEND**

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

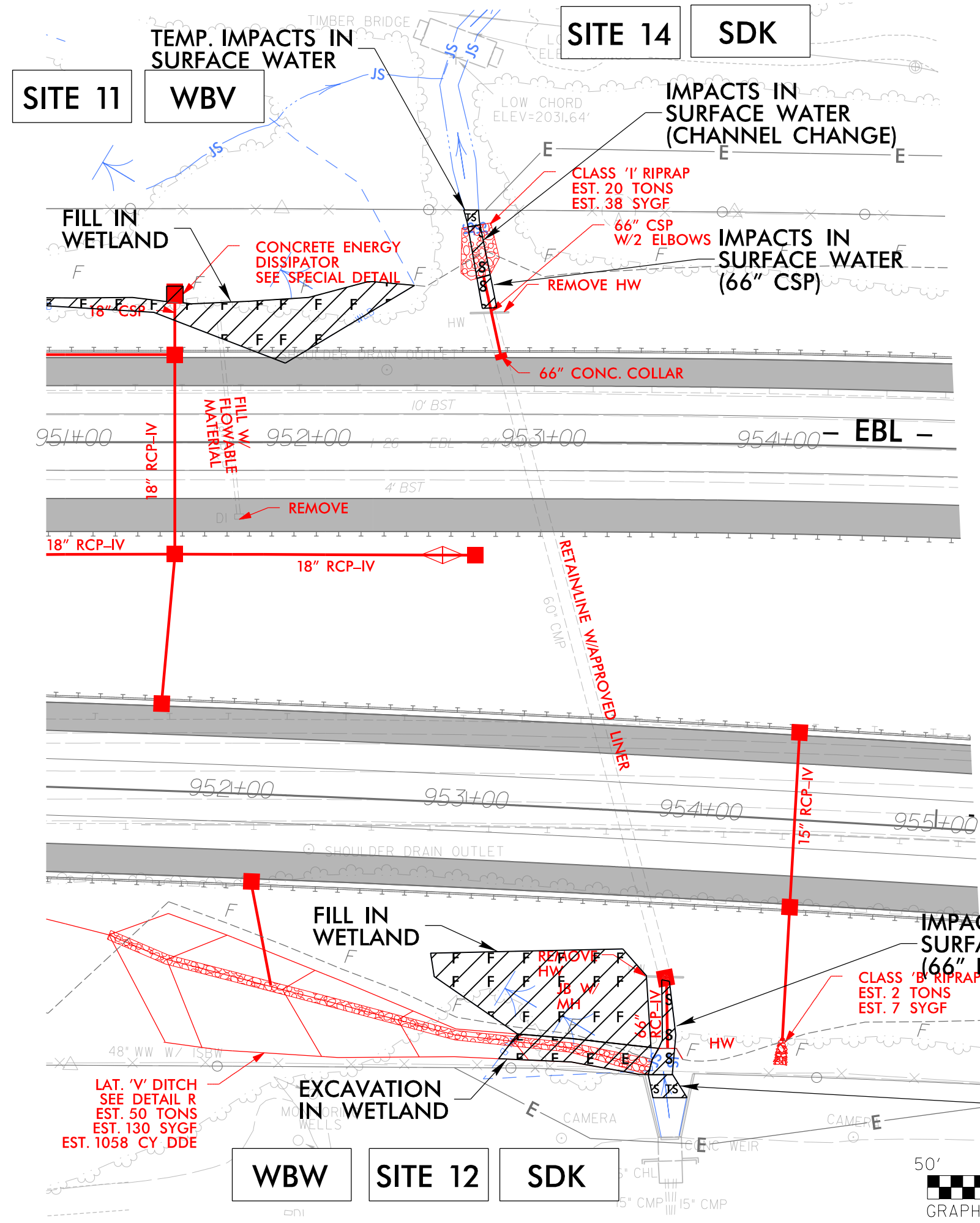


FOR - EBL - PROFILE, SEE SHEET 44 & 45  
 FOR - WBL - PROFILE, SEE SHEET 44 & 45  
 FOR RETAINING WALL -RW8-, SEE SHEET W-7

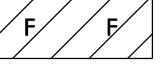
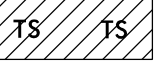
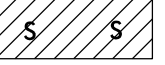

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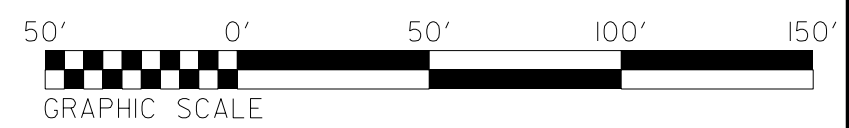


**PERMIT DRAWING  
SHEET 29 OF 97**



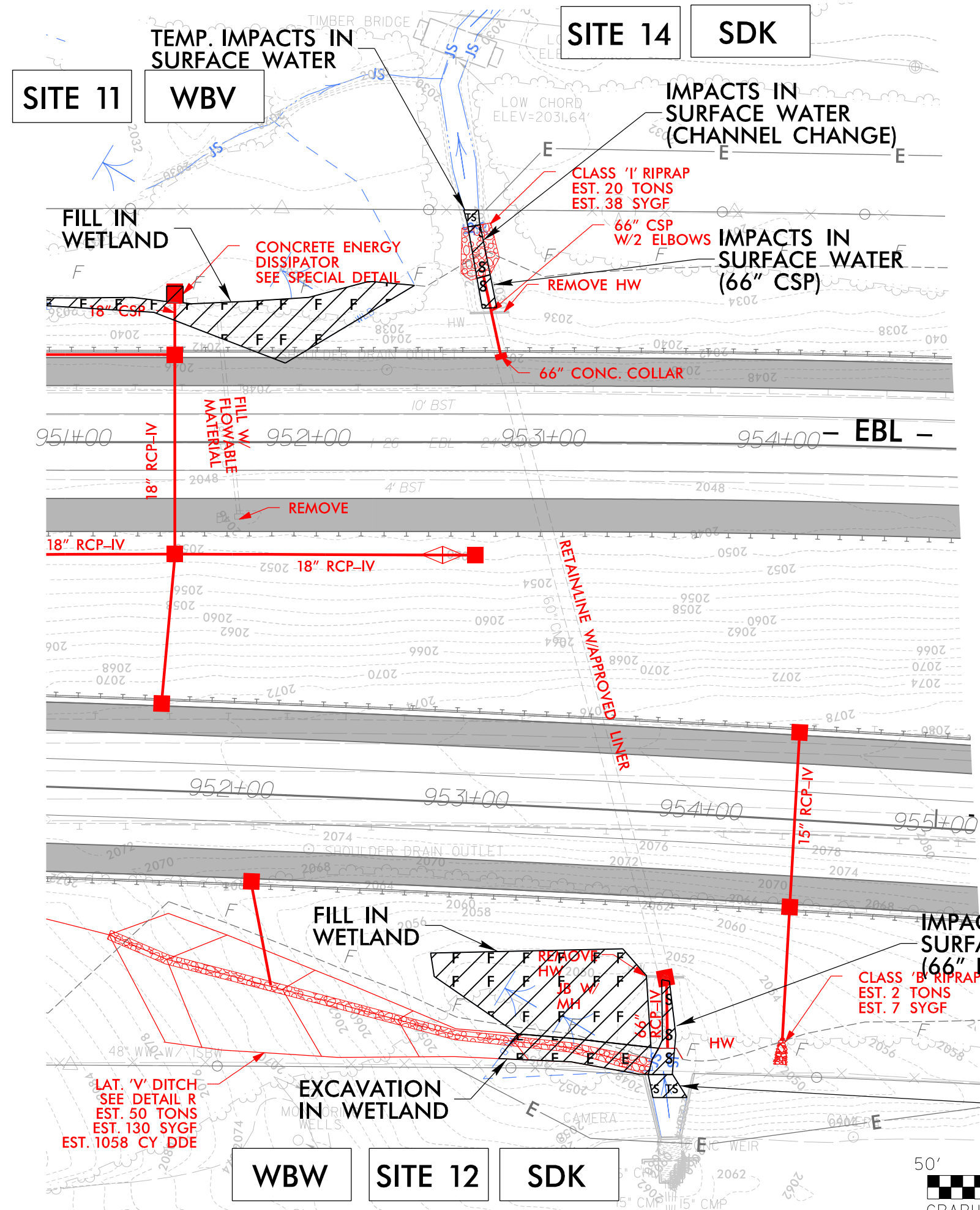
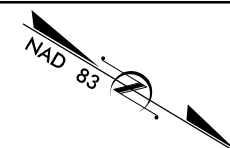
**LEGEND**

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

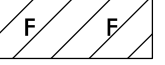
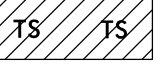
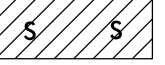



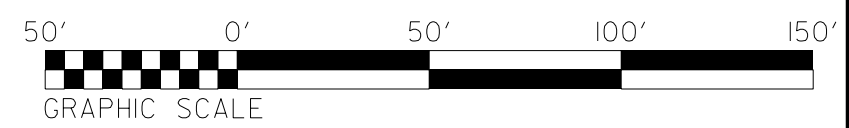
PROJECT REFERENCE NO. 1-4700	SHEET NO. 13
RW SHEET NO. 1-4700A-24	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

**PERMIT DRAWING  
SHEET 30 OF 97**



**LEGEND**

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



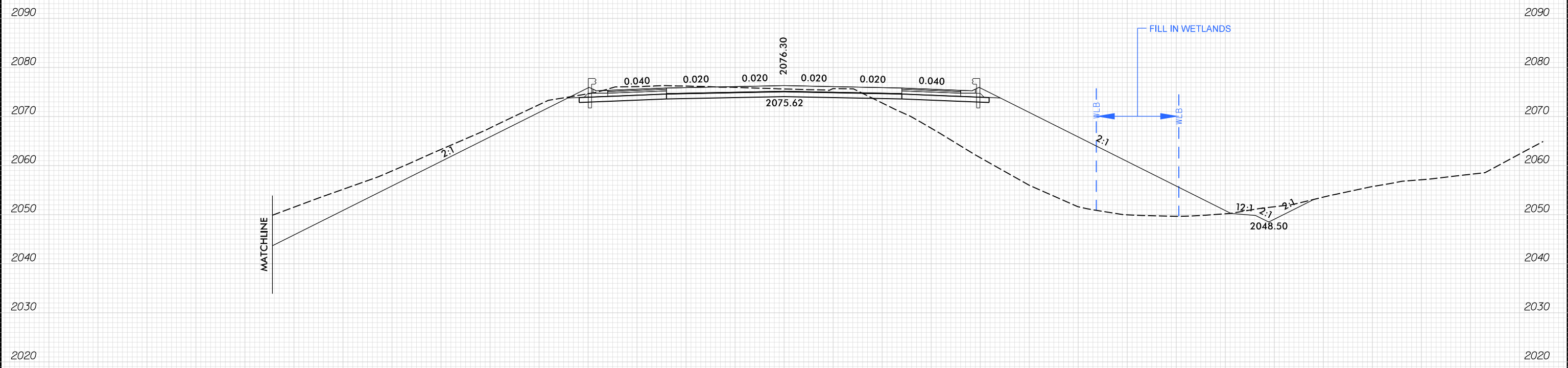
6/23/16

5	10	PROJ. REFERENCE NO.	SHEET NO.
		I-4700	

**PERMIT DRAWING  
SHEET 31 OF 97**

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

# WETLAND CROSS SECTIONS



**SITE 13**  
-WBL- 953 + 00.00

**SCALE**  
1"=20' HORIZONTAL  
1"=20' VERTICAL

BUNCOMBE & HENDERSON COUNTY  
PROJECT: I-4700  
I-26  
FROM 0.3 MI EAST OF NC 280 (AIRPORT RD.)  
TO 0.5 MI EAST OF NC 191 (BREVARD RD.)

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

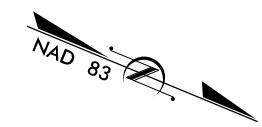
11/13/2008  
14700A-HYD-PRM\_PSH\_XPL  
PNT/B



PROJECT REFERENCE NO.	SHEET NO.
1-4700	15
RW SHEET NO.	1-4700A-26
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

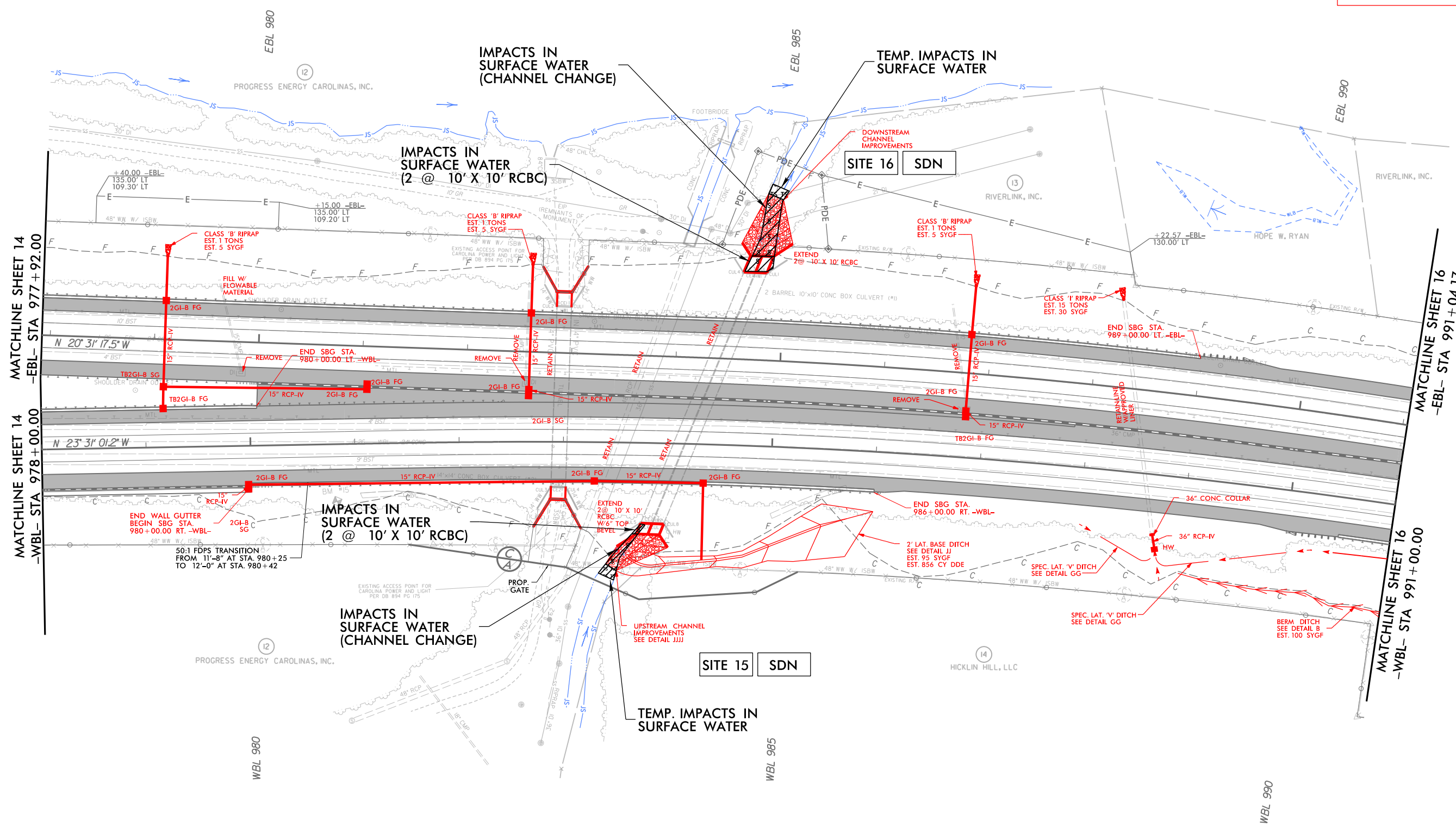
**PERMIT DRAWING  
SHEET 33 OF 97**

# WETLAND & STREAM IMPACTS



**LEGEND**

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

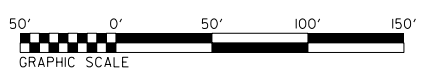


MATCHLINE SHEET 14  
-EBL- STA 977 + 92.00

MATCHLINE SHEET 14  
-WBL- STA 978 + 00.00

MATCHLINE SHEET 16  
-EBL- STA 991 + 04.17

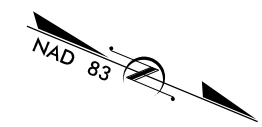
MATCHLINE SHEET 16  
-WBL- STA 991 + 00.00



PROJECT REFERENCE NO. 1-4700	SHEET NO. 15
RW SHEET NO. 1-4700A-26	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

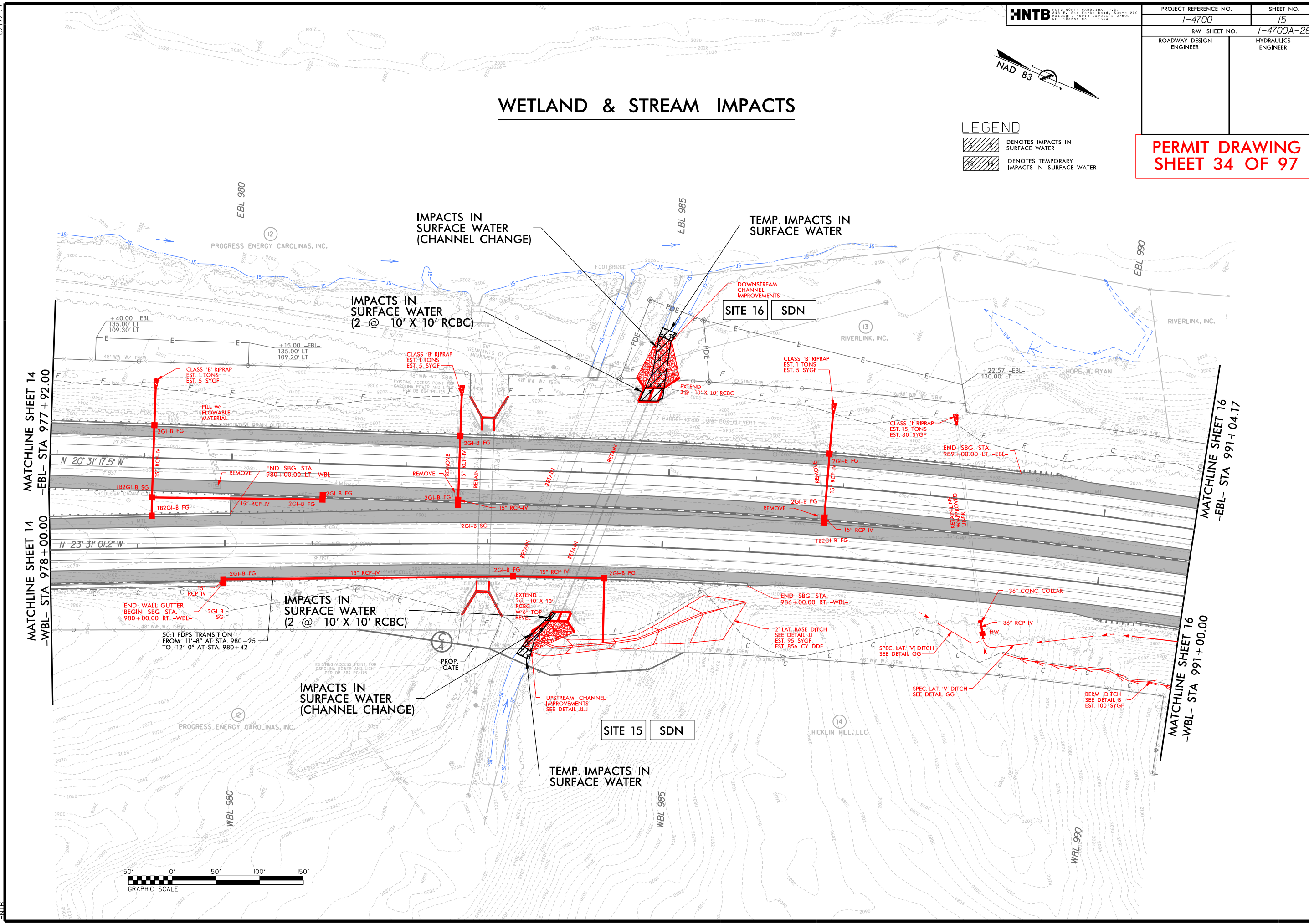
**PERMIT DRAWING  
SHEET 34 OF 97**

# WETLAND & STREAM IMPACTS



**LEGEND**

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

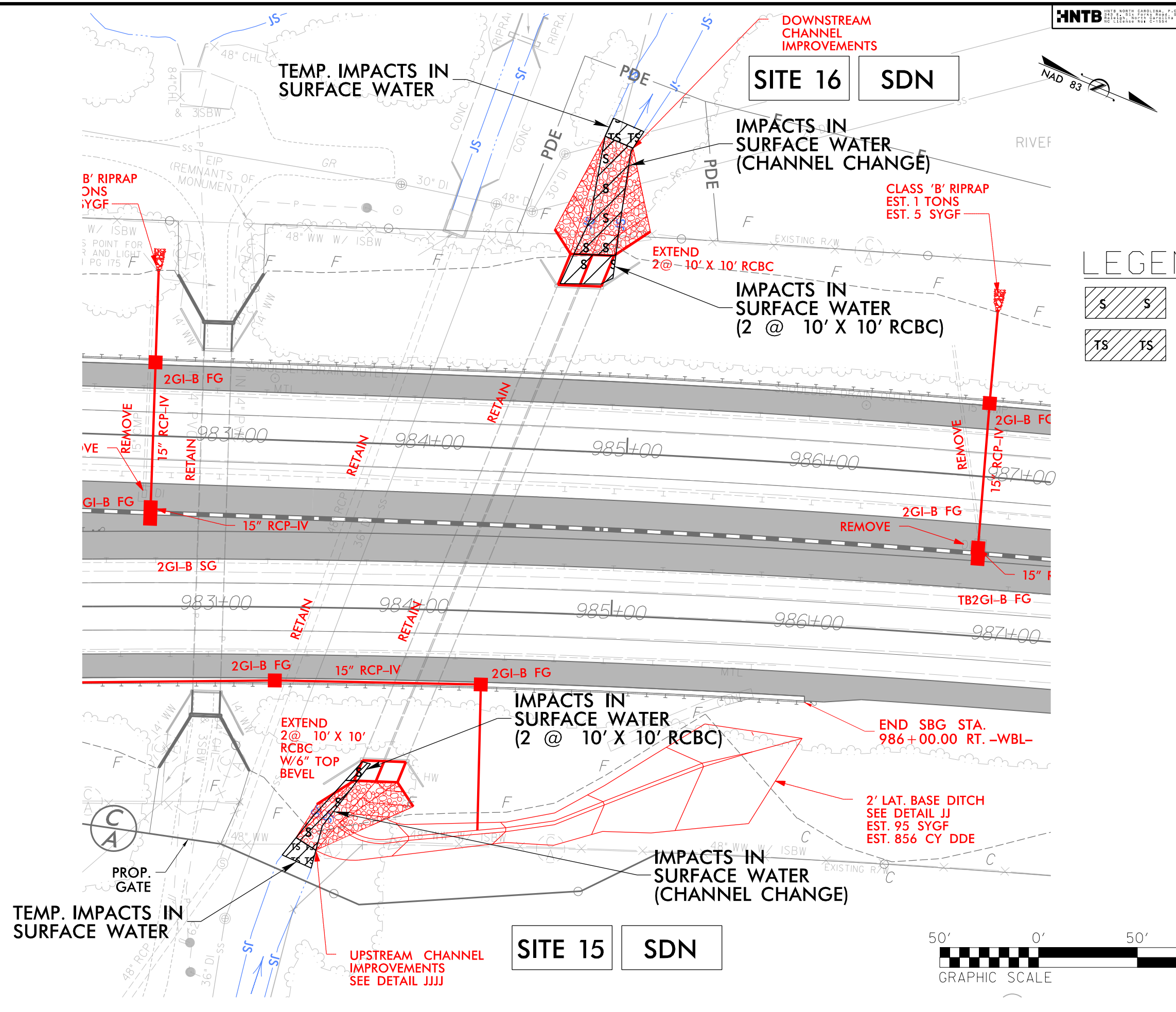


8/17/99

11/3/2018  
1-4700A-HYD\_PSH\_15.dgn  
HNTB

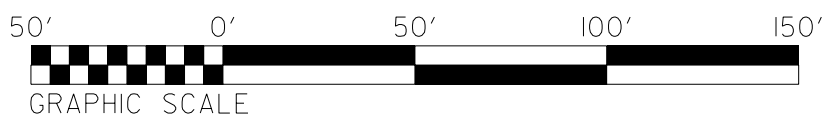
PROJECT REFERENCE NO. 1-4700	SHEET NO. 15
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

**PERMIT DRAWING  
 SHEET 35 OF 97**



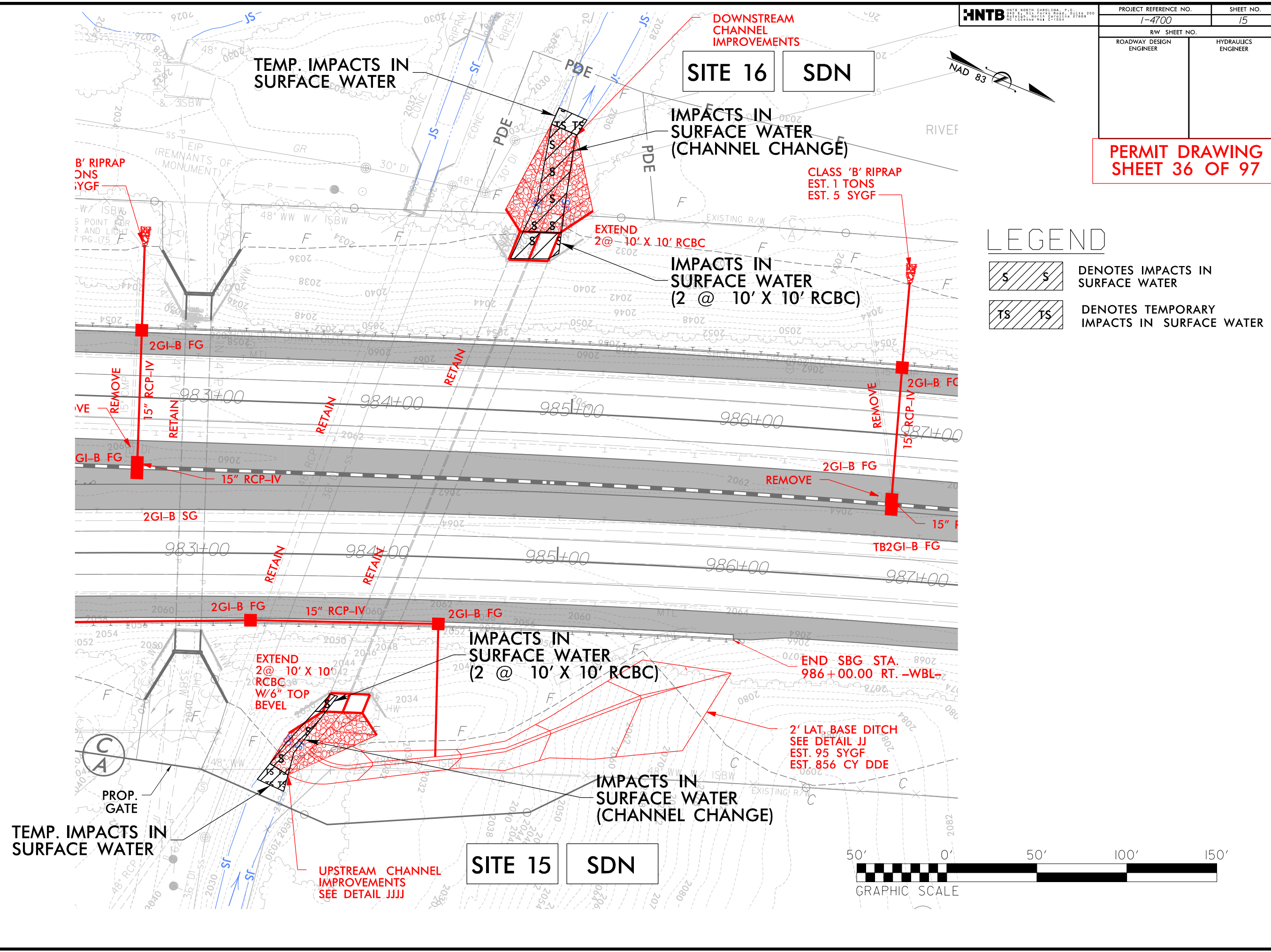
**LEGEND**

	DENOTES IMPACTS IN SURFACE WATER
	DENOTES TEMPORARY IMPACTS IN SURFACE WATER



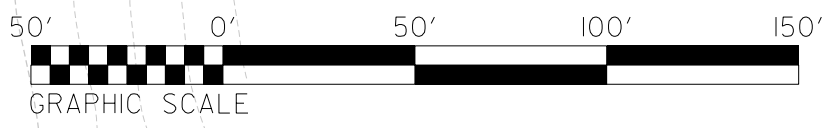
PROJECT REFERENCE NO. 1-4700	SHEET NO. 15
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 36 OF 97

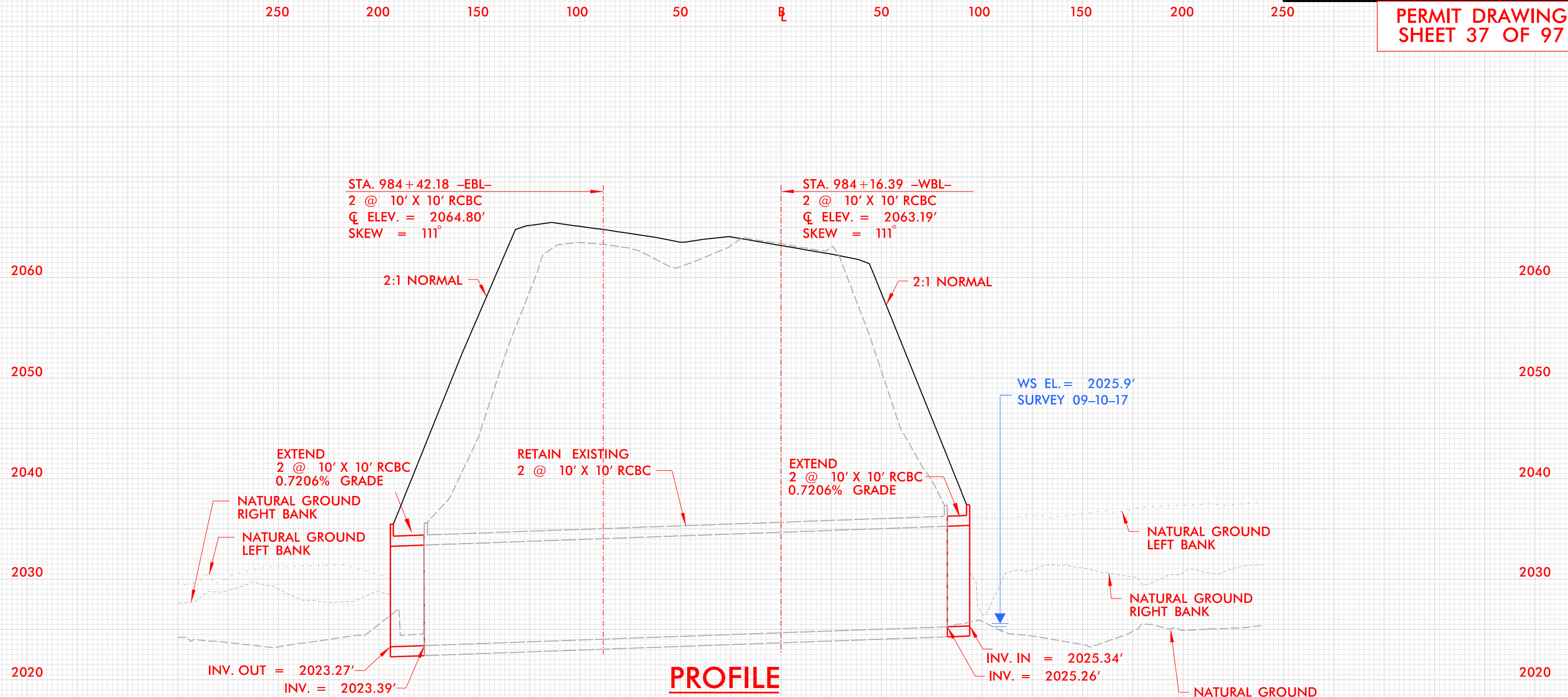


**LEGEND**

	DENOTES IMPACTS IN SURFACE WATER
	DENOTES TEMPORARY IMPACTS IN SURFACE WATER



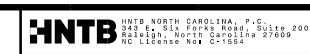
6/23/16



11/13/2016 11:15 AM I:\13\2016\11\13\2016\HYD\_PRM\_PSH\_15B\_PFL.dgn

BUNCOMBE & HENDERSON COUNTY  
 PROJECT: I-4700  
 I-26  
 FROM 0.3 MI EAST OF NC 280 (AIRPORT RD.)  
 TO 0.5 MI EAST OF NC 191 (BREVARD RD.)

8/17/99



PROJECT REFERENCE NO.	1-4700	SHEET NO.	18
R/W SHEET NO.	1-4700A-28		
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	

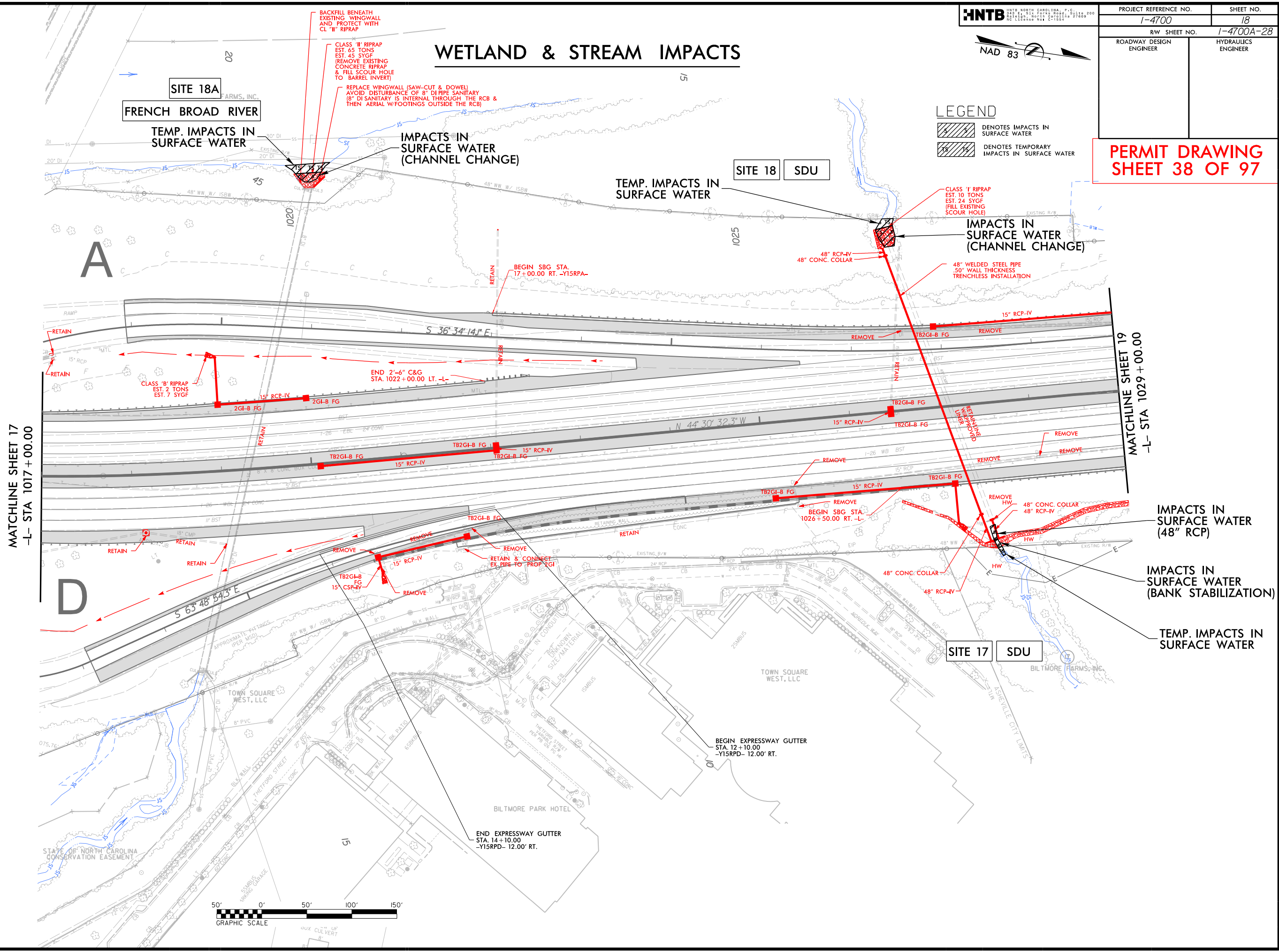
# WETLAND & STREAM IMPACTS



**LEGEND**

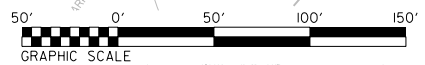
	DENOTES IMPACTS IN SURFACE WATER
	DENOTES TEMPORARY IMPACTS IN SURFACE WATER

**PERMIT DRAWING SHEET 38 OF 97**



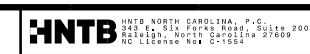
MATCHLINE SHEET 17  
-L- STA 1017 + 00.00

MATCHLINE SHEET 19  
-L- STA 1029 + 00.00



11/13/2018 11:47:00A\_HYD\_PSH\_18.dgn

8/17/99



PROJECT REFERENCE NO.	SHEET NO.
1-4700	18
RW SHEET NO.	1-4700A-28
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

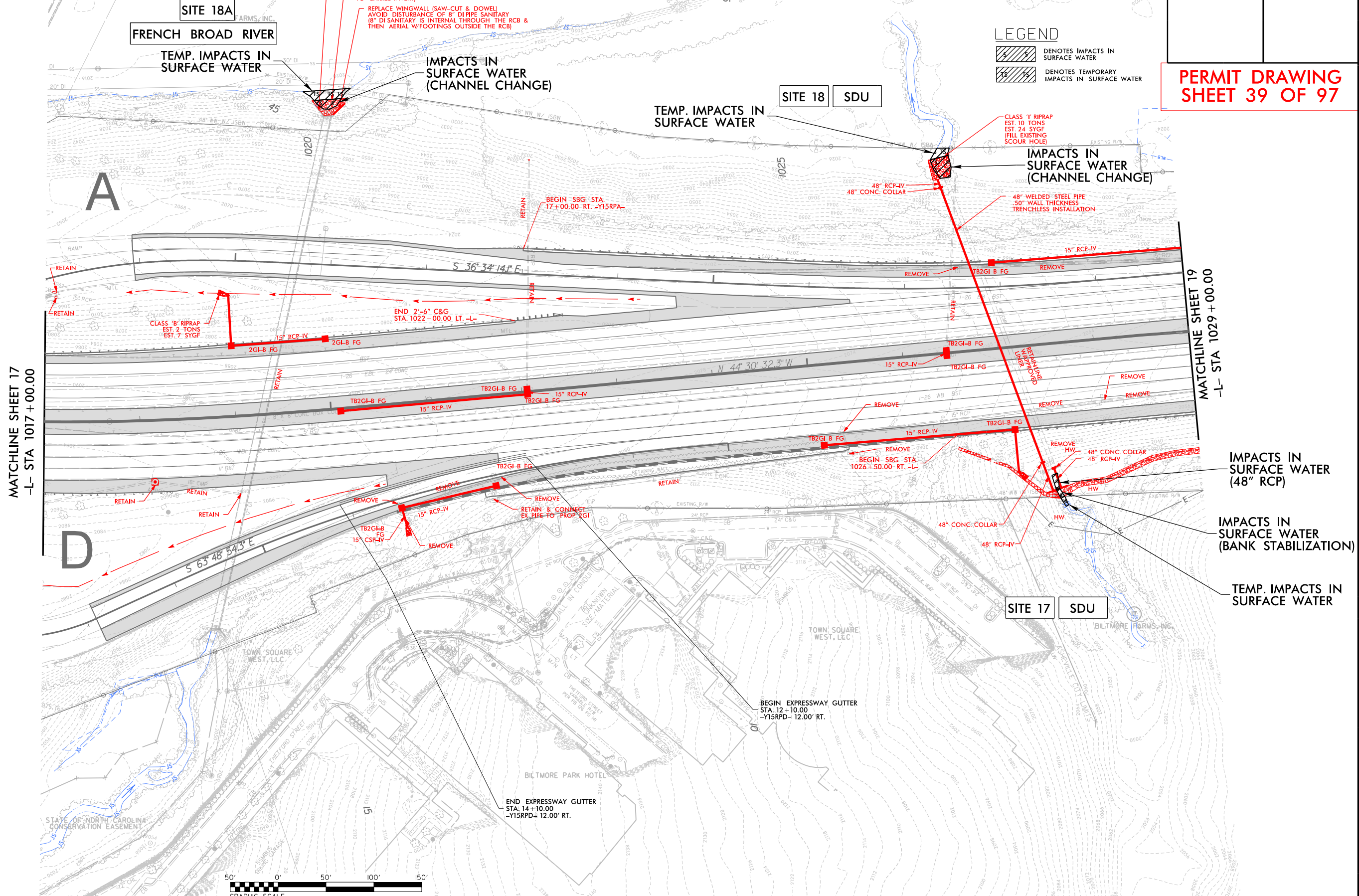
# WETLAND & STREAM IMPACTS



**LEGEND**

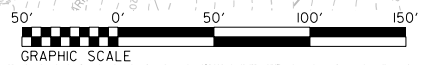
	DENOTES IMPACTS IN SURFACE WATER
	DENOTES TEMPORARY IMPACTS IN SURFACE WATER

**PERMIT DRAWING SHEET 39 OF 97**



MATCHLINE SHEET 17  
-L- STA 1017 + 00.00

MATCHLINE SHEET 19  
-L- STA 1029 + 00.00



11/13/2018 11:47:00A\_HYD\_PSM\_18.dgn

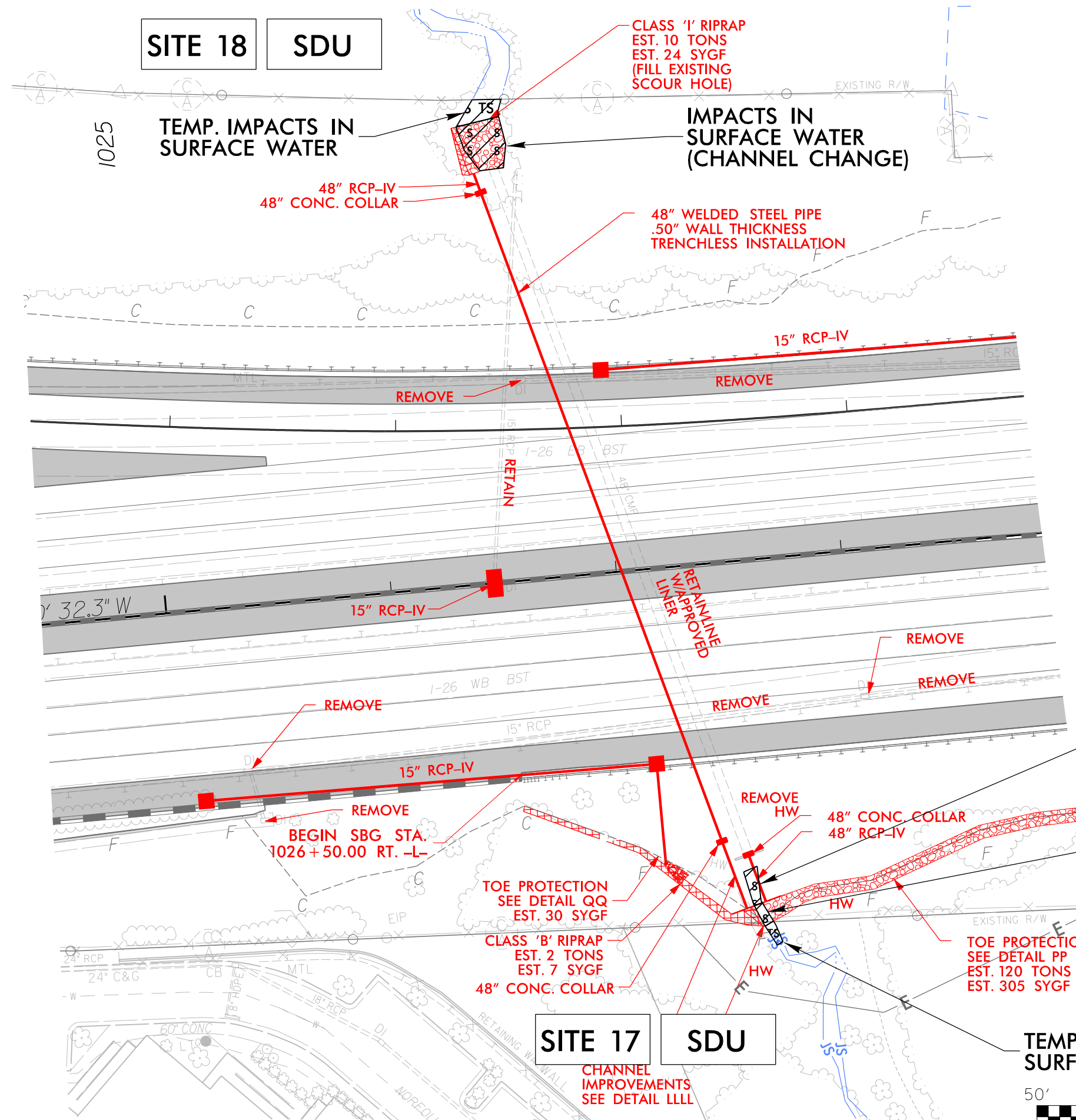
PROJECT REFERENCE NO. 1-4700	SHEET NO. 18
R/W SHEET NO. 1-4700A-28	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



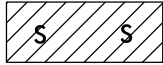

**PERMIT DRAWING  
SHEET 40 OF 97**

**SITE 18 SDU**

**SITE 17 SDU**



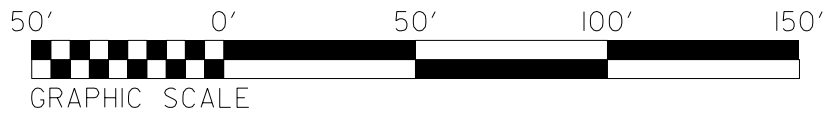
**LEGEND**

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

**IMPACTS IN SURFACE WATER (48" RCP)**

**IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL LLLL**

**TEMP. IMPACTS IN SURFACE WATER**



8/17/99  
11/3/2018  
1-4700A-HYD\_PRL\_PSH\_18A.dgn  
HNTB

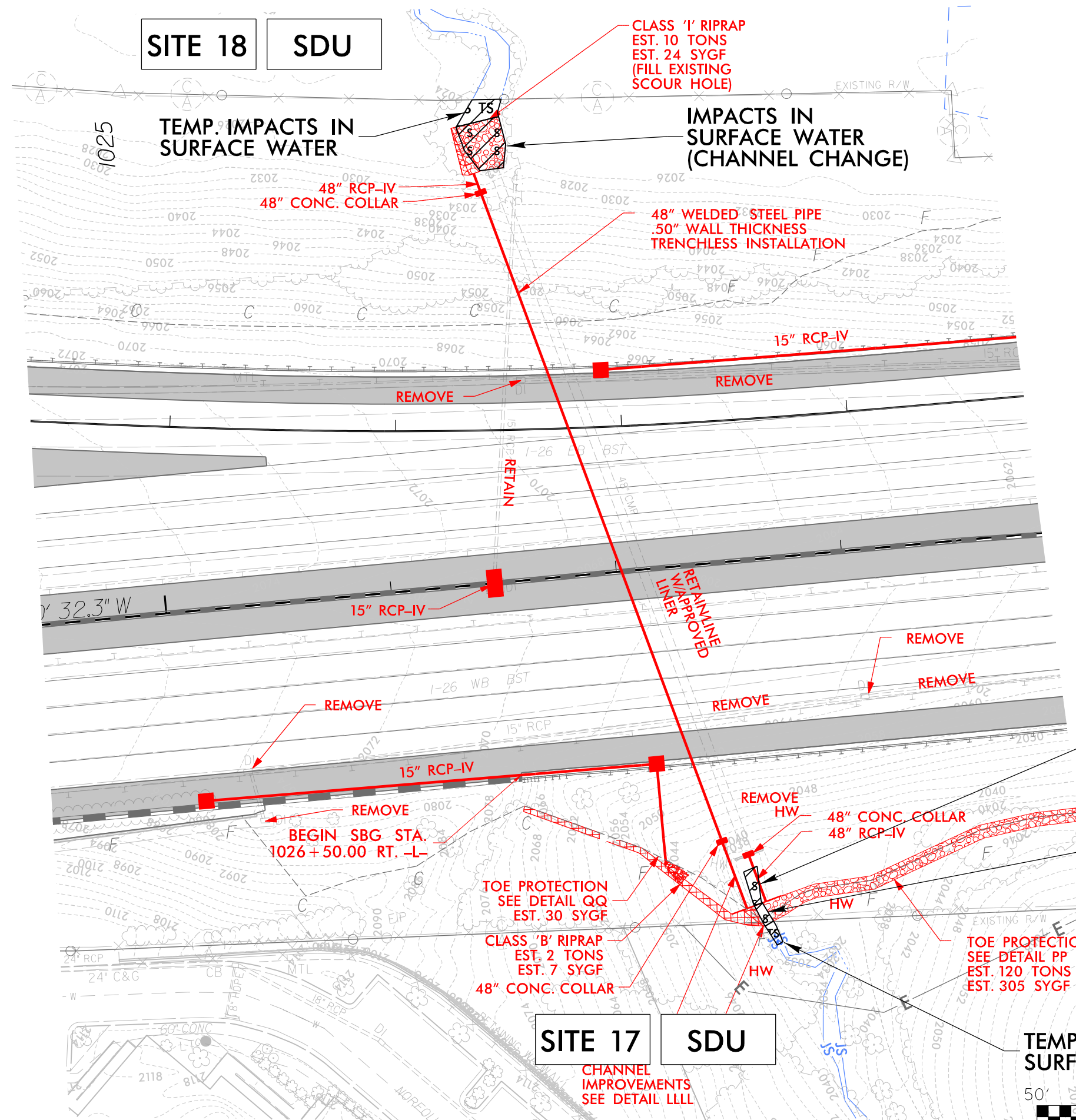
PROJECT REFERENCE NO. 1-4700	SHEET NO. 18
R/W SHEET NO. 1-4700A-28	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



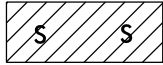

**PERMIT DRAWING  
SHEET 41 OF 97**

**SITE 18 SDU**

**SITE 17 SDU**



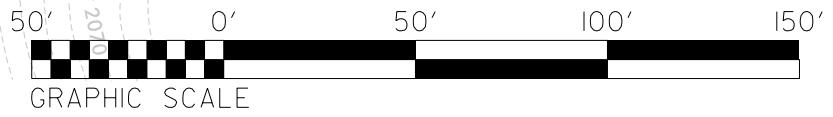
**LEGEND**

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

**IMPACTS IN SURFACE WATER (48" RCP)**

**IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL LLLL**

**TEMP. IMPACTS IN SURFACE WATER**

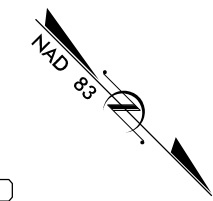


8/17/99  
 11/3/2018  
 1-4700A-HYD\_PRRM\_PSH\_18A.dgn  
 HNTB

8/17/99

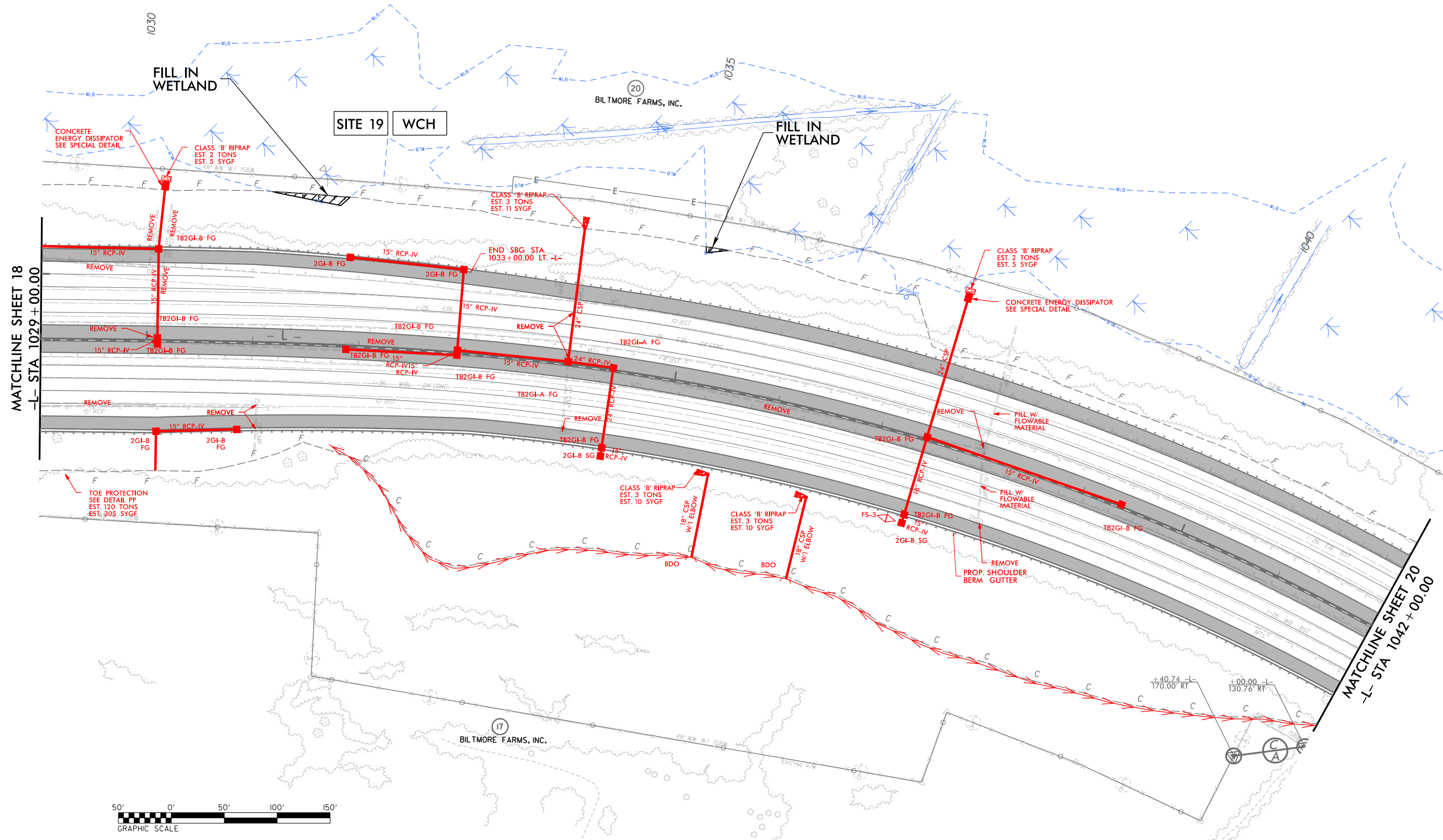
PROJECT REFERENCE NO. 1-4700	SHEET NO. 19
RW SHEET NO. 1-4700A-29	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	

# WETLAND & STREAM IMPACTS



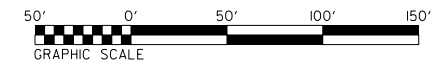
**LEGEND**  
 DENOTES FILL IN WETLAND

**PERMIT DRAWING  
SHEET 42 OF 97**



MATCHLINE SHEET 18  
-L- STA 1029+00.00

MATCHLINE SHEET 20  
-L- STA 1042+00.00



FOR - L - PROFILE, SEE SHEET 49

11/13/2008  
1-4700A-HYD\_PSH\_19.dgn  
HNTB

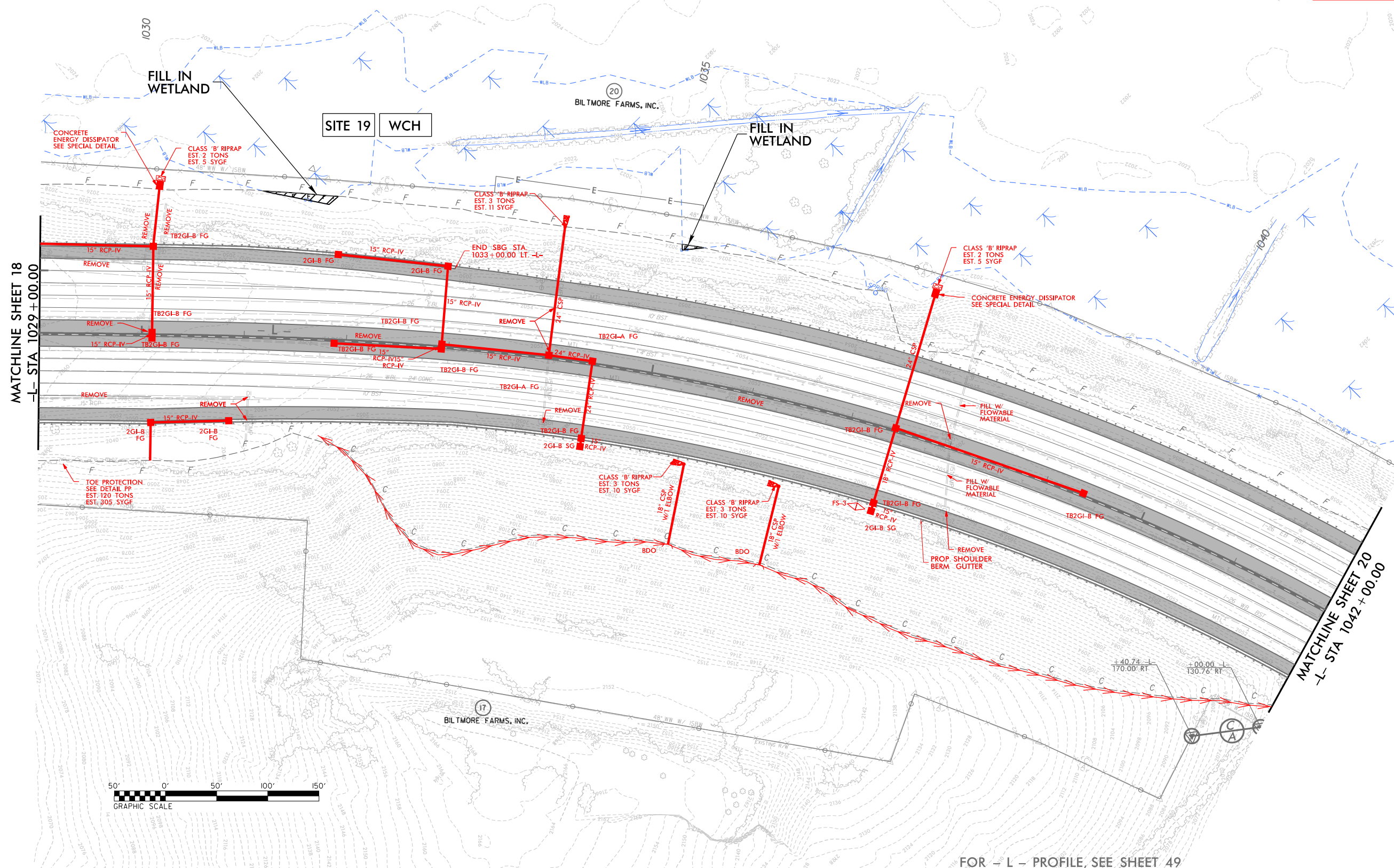
8/17/99

# WETLAND & STREAM IMPACTS

**LEGEND**

 DENOTES FILL IN WETLAND

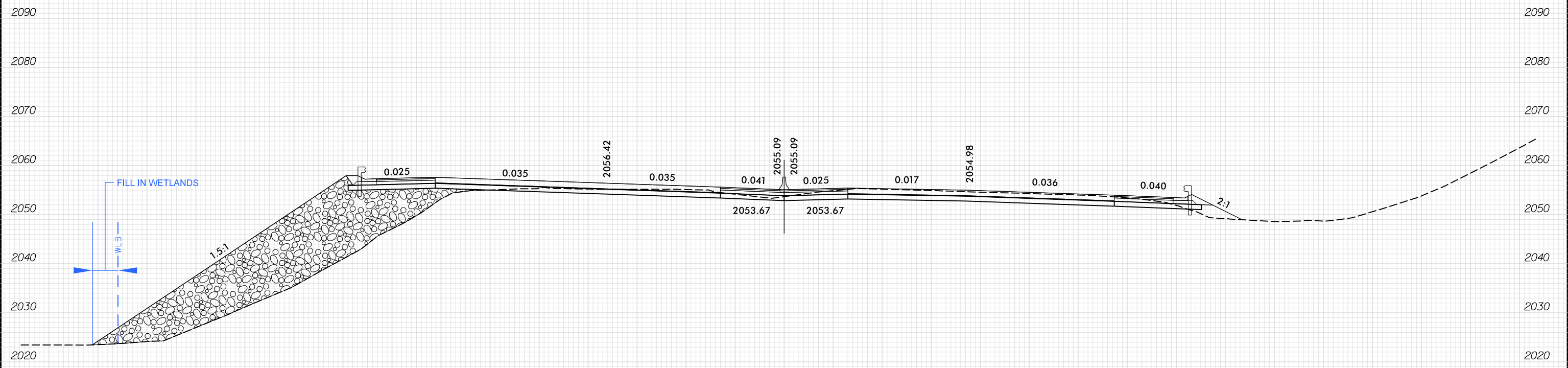
**PERMIT DRAWING  
SHEET 43 OF 97**



11/3/2018 11:47:00A\_HYD\_PRRM\_PSH\_19.dgn

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

# WETLAND CROSS SECTIONS



**SITE 19**  
-WBL- 953 + 50.00

**SCALE**  
1"=20' HORIZONTAL  
1"=20' VERTICAL

BUNCOMBE & HENDERSON COUNTY  
PROJECT: I-4700  
I-26  
FROM 0.3 MI EAST OF NC 280 (AIRPORT RD.)  
TO 0.5 MI EAST OF NC 191 (BREVARD RD.)

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

8/17/99

PROJECT REFERENCE NO. 1-4700	SHEET NO. 20
RW SHEET NO. 1-4700A-30	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

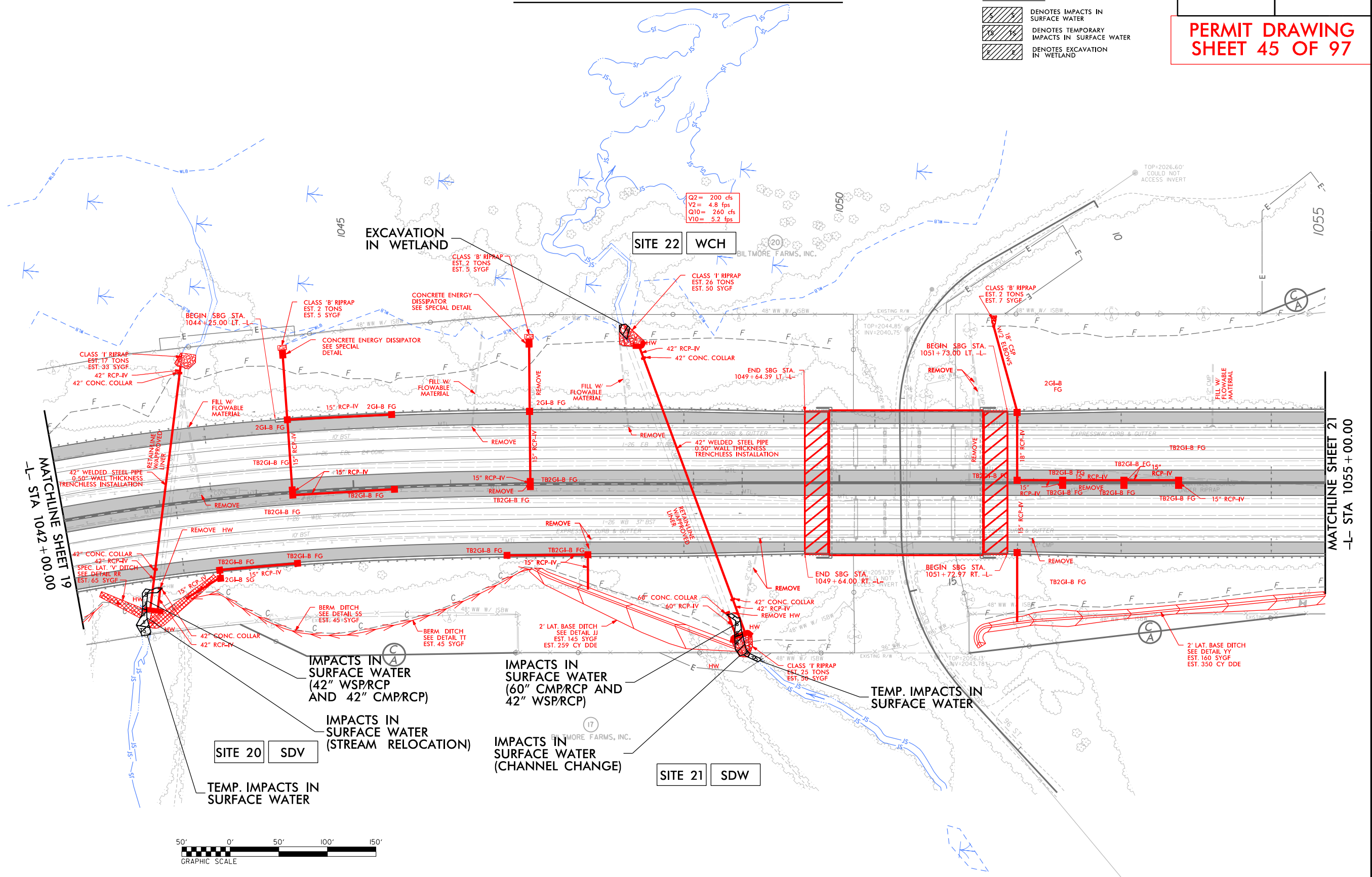


# WETLAND & STREAM IMPACTS

**LEGEND**

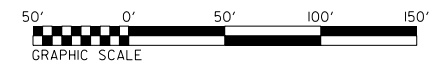
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES EXCAVATION IN WETLAND

**PERMIT DRAWING  
SHEET 45 OF 97**



MATCHLINE SHEET 19  
-L- STA 1042 + 00.00

MATCHLINE SHEET 21  
-L- STA 1055 + 00.00



11/13/2018  
1-4700A-HYD\_PRM\_PSH\_20.dgn  
HNTB

8/17/99

PROJECT REFERENCE NO. 1-4700	SHEET NO. 20
RW SHEET NO. 1-4700A-30	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

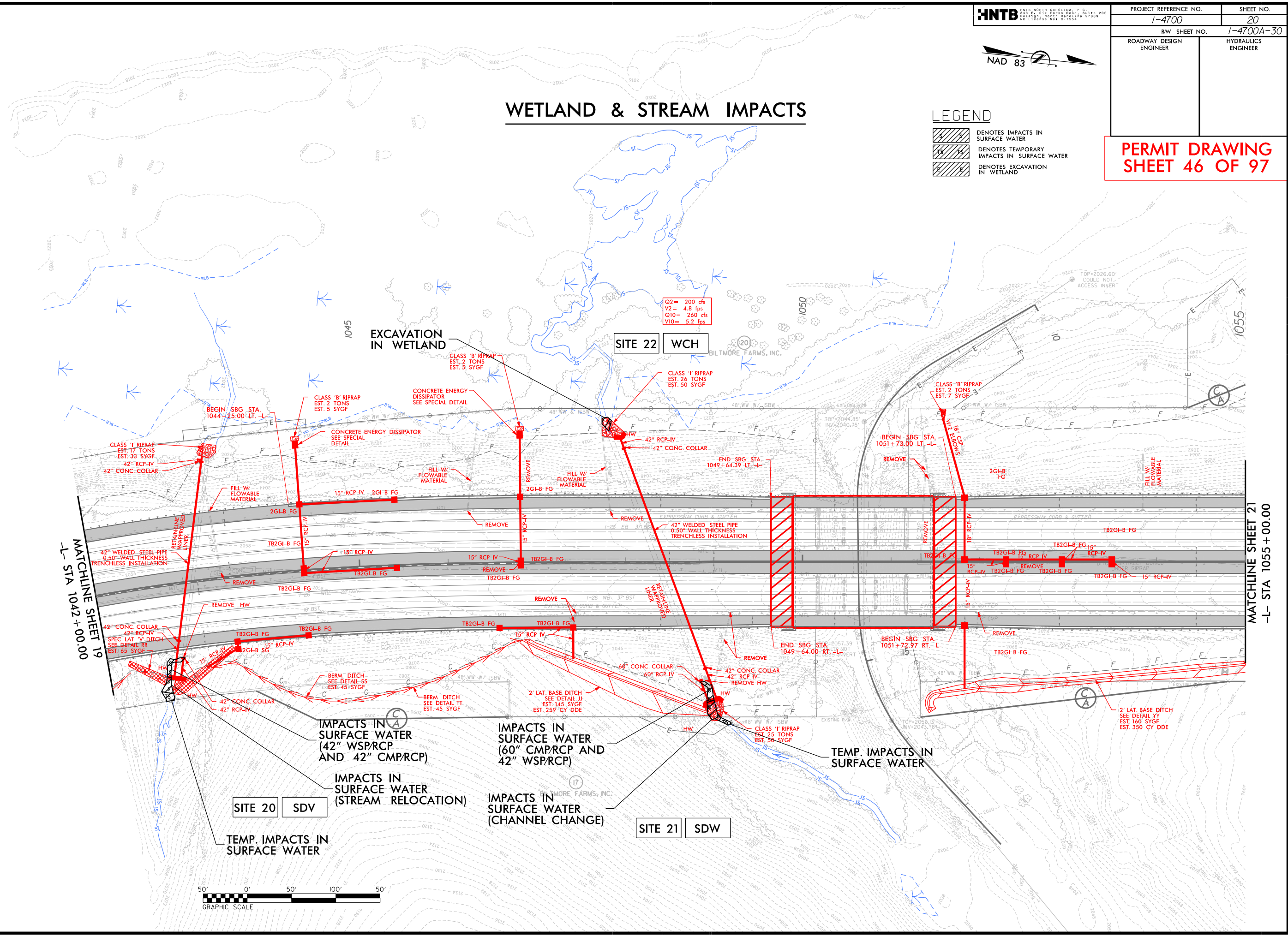


# WETLAND & STREAM IMPACTS

**LEGEND**

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

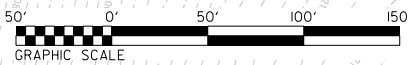
**PERMIT DRAWING  
SHEET 46 OF 97**



Q2 = 200 cfs  
Y2 = 4.8 fps  
Q10 = 260 cfs  
Y10 = 5.2 fps

MATCHLINE SHEET 19  
-L- STA 1042 + 00.00

MATCHLINE SHEET 21  
-L- STA 1055 + 00.00



11/3/2018  
1-4700A-HYD\_PSH\_20.dgn  
HNTB

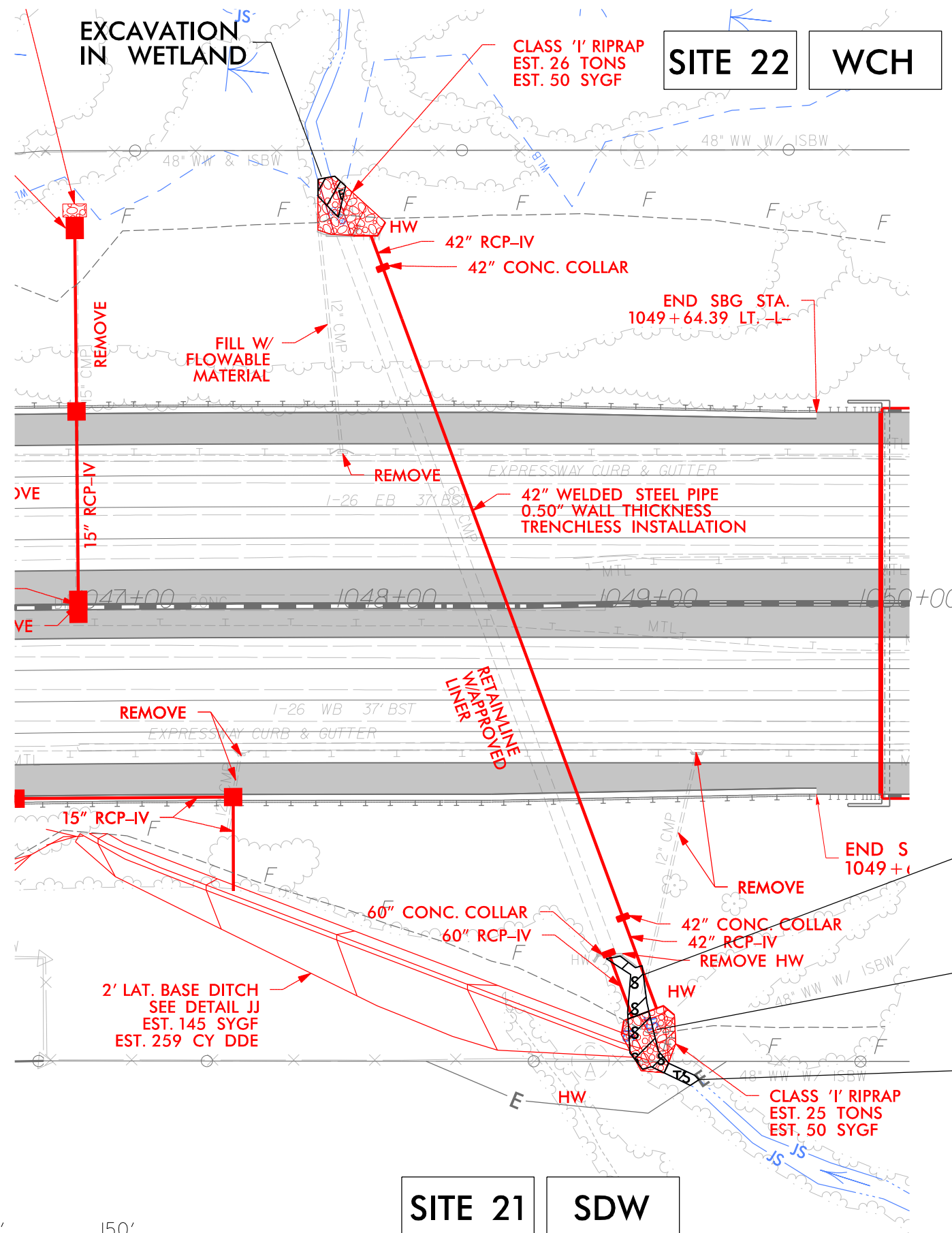
PROJECT REFERENCE NO.	SHEET NO.
1-4700	20
RW SHEET NO.	1-4700A-30
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



**PERMIT DRAWING  
SHEET 47 OF 97**

**LEGEND**

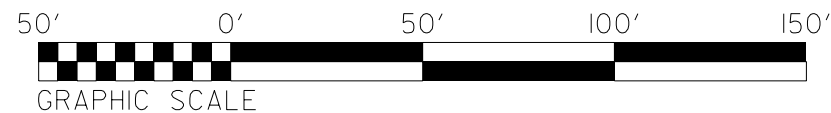
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES EXCAVATION IN WETLAND



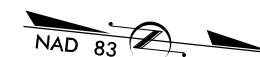
**IMPACTS IN SURFACE WATER (60" CMP/RCP AND 42" WSP/RCP)**

**IMPACTS IN SURFACE WATER (CHANNEL CHANGE)**

**TEMP. IMPACTS IN SURFACE WATER**



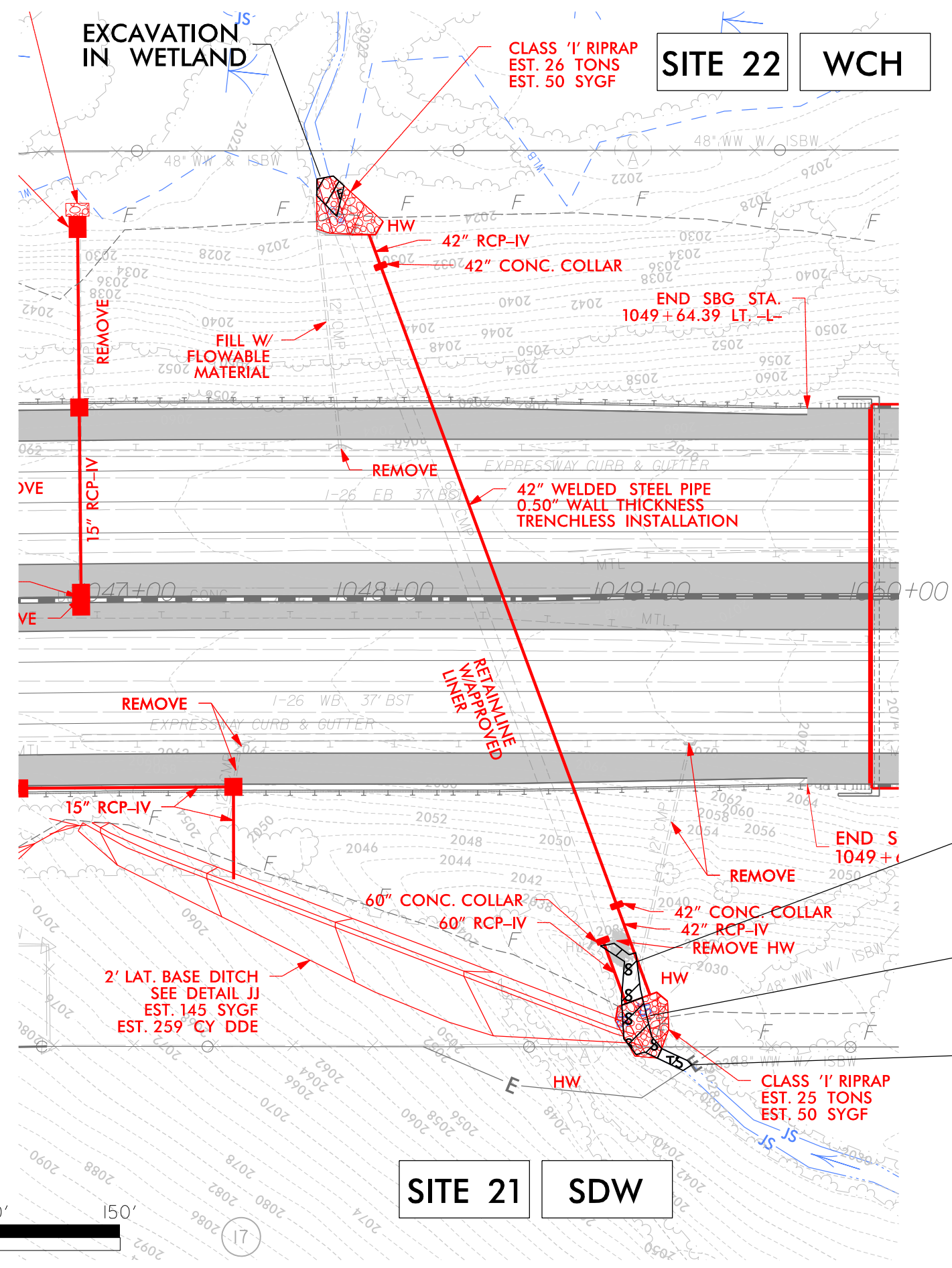
PROJECT REFERENCE NO.	SHEET NO.
1-4700	20
RW SHEET NO.	1-4700A-30
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



**PERMIT DRAWING  
SHEET 48 OF 97**

**LEGEND**

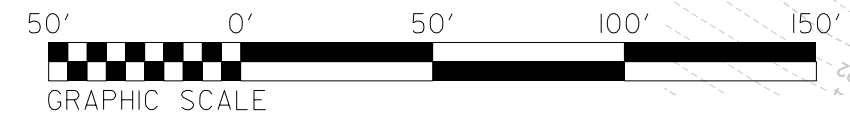
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- DENOTES EXCAVATION IN WETLAND



IMPACTS IN SURFACE WATER  
(60" CMP/RCP AND 42" WSP/RCP)

IMPACTS IN SURFACE WATER  
(CHANNEL CHANGE)

TEMP. IMPACTS IN SURFACE WATER



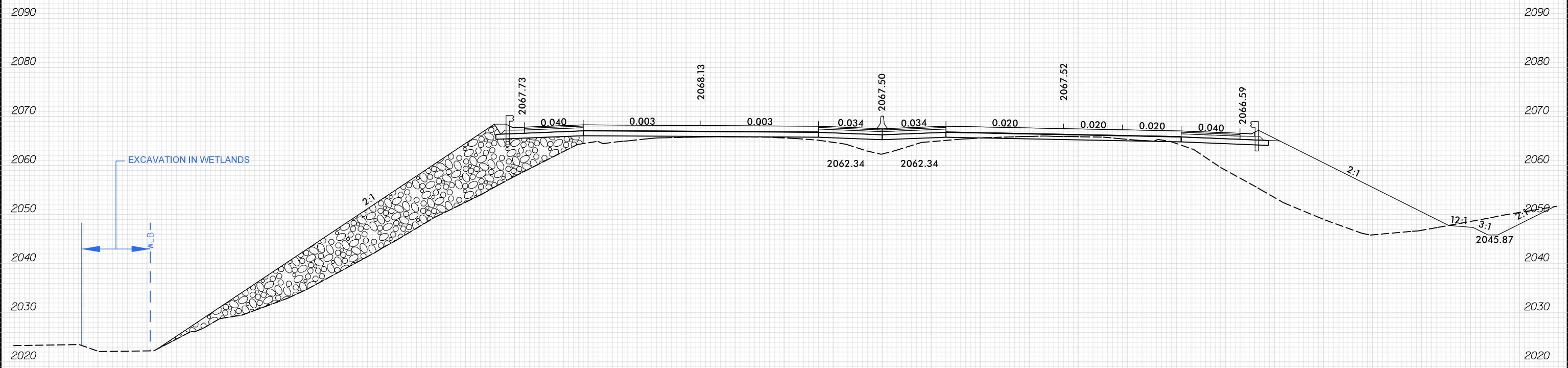
6/23/16

5	10	PROJ. REFERENCE NO.	SHEET NO.
		I-4700	

**PERMIT DRAWING  
SHEET 49 OF 97**

170 160 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100

# WETLAND CROSS SECTIONS



**SITE 22**  
-L2- 1047 + 80.00

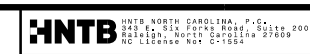
**SCALE**  
1"=20' HORIZONTAL  
1"=20' VERTICAL

BUNCOMBE & HENDERSON COUNTY  
PROJECT: I-4700  
I-26  
FROM 0.3 MI EAST OF NC 280 (AIRPORT RD.)  
TO 0.5 MI EAST OF NC 191 (BREVARD RD.)

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

11/13/2008  
I-4700A-HYD-PRM\_PSH\_XPL  
HNLB

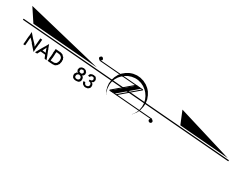
7/19/2017



PROJECT REFERENCE NO.	SHEET NO.
1-4700	23
RW SHEET NO.	1-4700B-33
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

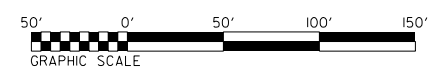
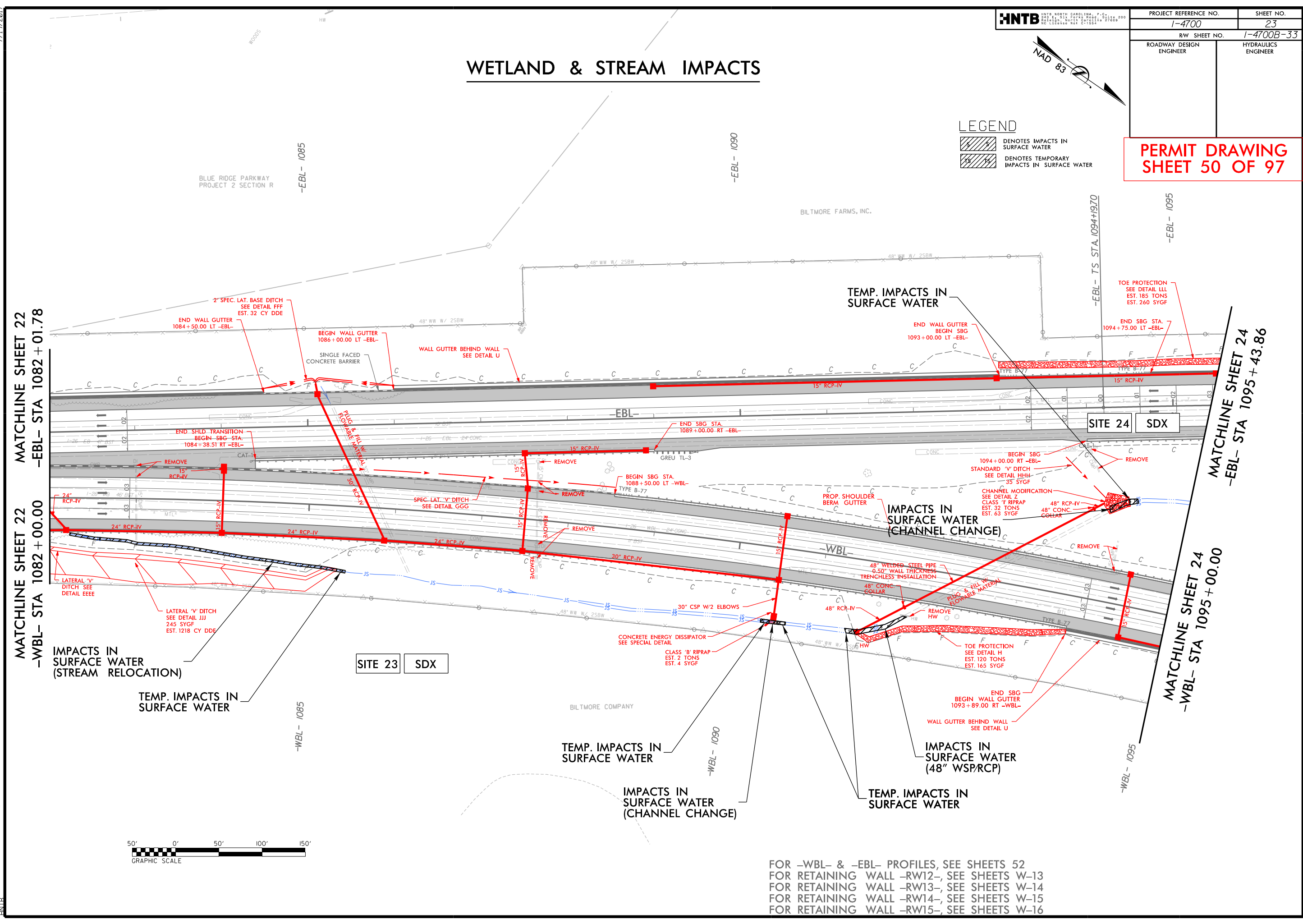
**PERMIT DRAWING  
SHEET 50 OF 97**

# WETLAND & STREAM IMPACTS



**LEGEND**

	DENOTES IMPACTS IN SURFACE WATER
	DENOTES TEMPORARY IMPACTS IN SURFACE WATER



FOR -WBL- & -EBL- PROFILES, SEE SHEETS 52  
 FOR RETAINING WALL -RW12-, SEE SHEETS W-13  
 FOR RETAINING WALL -RW13-, SEE SHEETS W-14  
 FOR RETAINING WALL -RW14-, SEE SHEETS W-15  
 FOR RETAINING WALL -RW15-, SEE SHEETS W-16

11/14/2018  
 1-4700B-HYD\_PSH\_23.dgn  
 HNTB

7/19/2017

11/14/2018  
4700B\_HYD\_PSM\_23.dgn  
HNTB

# WETLAND & STREAM IMPACTS

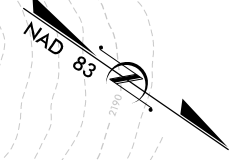


PROJECT REFERENCE NO. 1-4700	SHEET NO. 23
RW SHEET NO. 1-4700B-33	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

**PERMIT DRAWING  
SHEET 51 OF 97**

**LEGEND**

	DENOTES IMPACTS IN SURFACE WATER
	DENOTES TEMPORARY IMPACTS IN SURFACE WATER

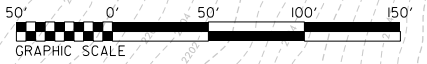
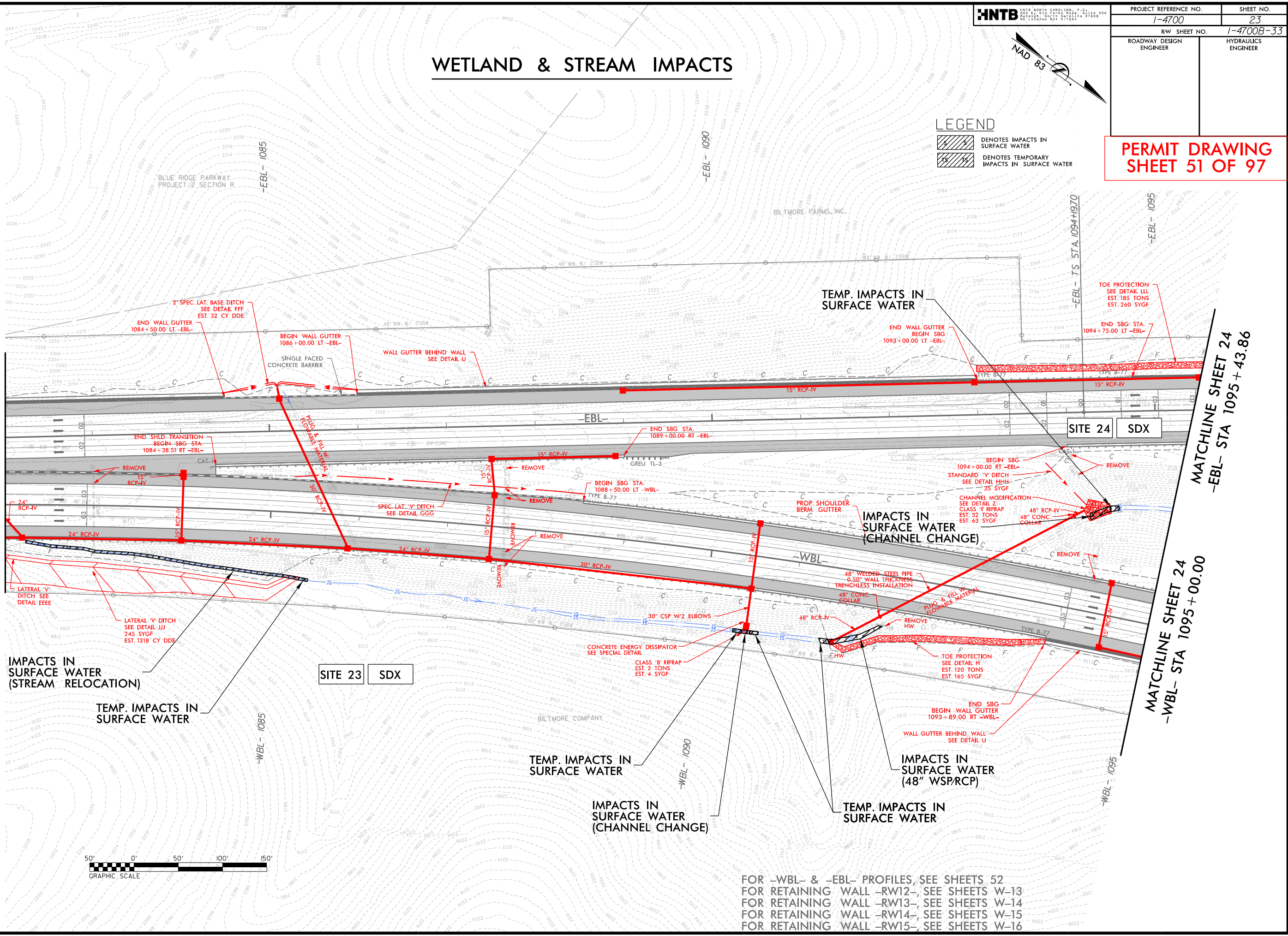


MATCHLINE SHEET 22  
-EBL- STA 1082 + 01.78

MATCHLINE SHEET 22  
-WBL- STA 1082 + 00.00

MATCHLINE SHEET 24  
-EBL- STA 1095 + 43.86

MATCHLINE SHEET 24  
-WBL- STA 1095 + 00.00



FOR -WBL- & -EBL- PROFILES, SEE SHEETS 52  
 FOR RETAINING WALL -RW12-, SEE SHEETS W-13  
 FOR RETAINING WALL -RW13-, SEE SHEETS W-14  
 FOR RETAINING WALL -RW14-, SEE SHEETS W-15  
 FOR RETAINING WALL -RW15-, SEE SHEETS W-16

7/19/2017

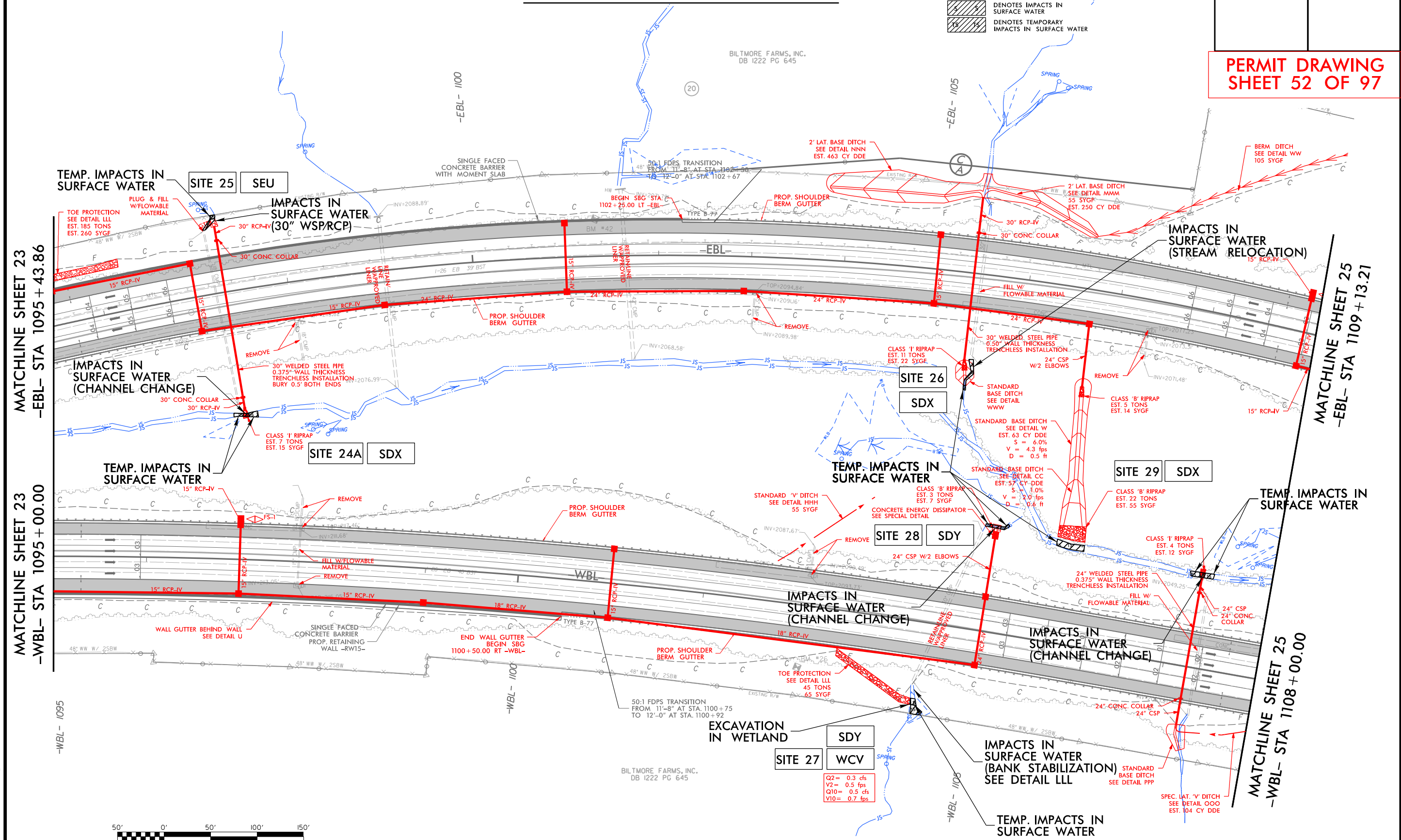
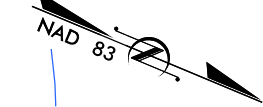
PROJECT REFERENCE NO. 1-4700	SHEET NO. 24
RW SHEET NO. 1-4700B-34	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

**PERMIT DRAWING  
SHEET 52 OF 97**

# WETLAND & STREAM IMPACTS

## LEGEND

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

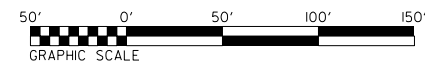


MATCHLINE SHEET 23  
-EBL- STA 1095 + 43.86

MATCHLINE SHEET 23  
-WBL- STA 1095 + 00.00

MATCHLINE SHEET 25  
-EBL- STA 1109 + 13.21

MATCHLINE SHEET 25  
-WBL- STA 1108 + 00.00

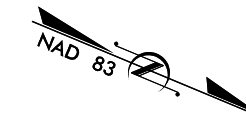


**SITE 27**  
SDY  
WCV  
Q2 = 0.3 cfs  
V2 = 0.5 fps  
Q10 = 0.5 cfs  
V10 = 0.7 fps

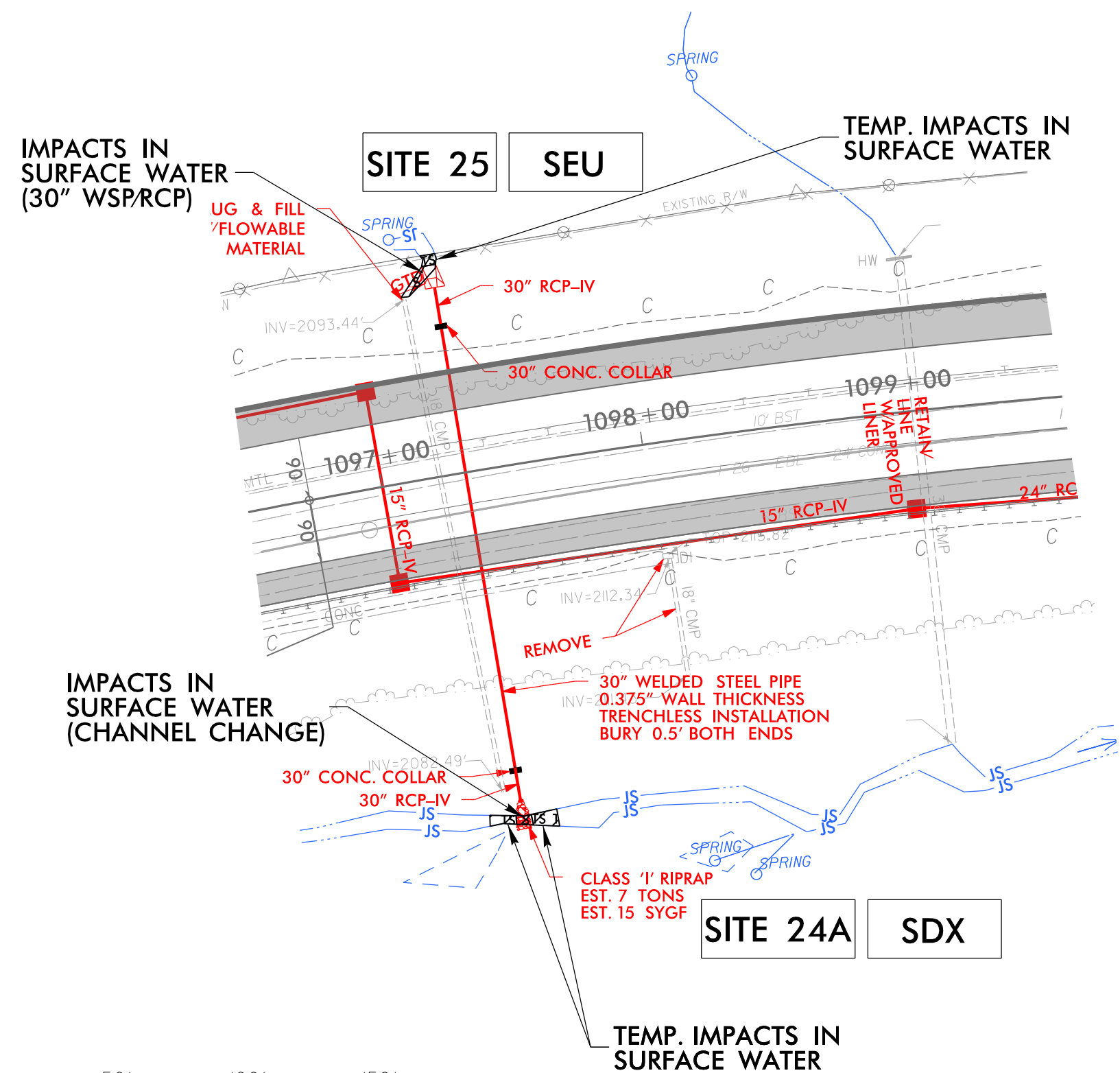
FOR -WBL- & -EBL- PROFILES, SEE SHEETS 52 & 53  
 FOR RETAINING WALL -RW14-, SEE SHEETS W-15  
 FOR RETAINING WALL -RW15-, SEE SHEETS W-16

11/14/2018  
 147700B\_HYD\_PRR\_PSH\_24.dgn  
 HNTB



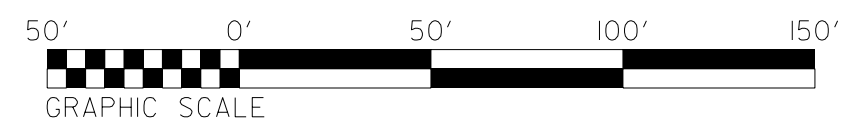


**PERMIT DRAWING  
SHEET 54 OF 97**

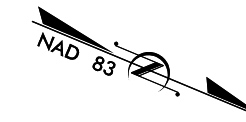


**LEGEND**

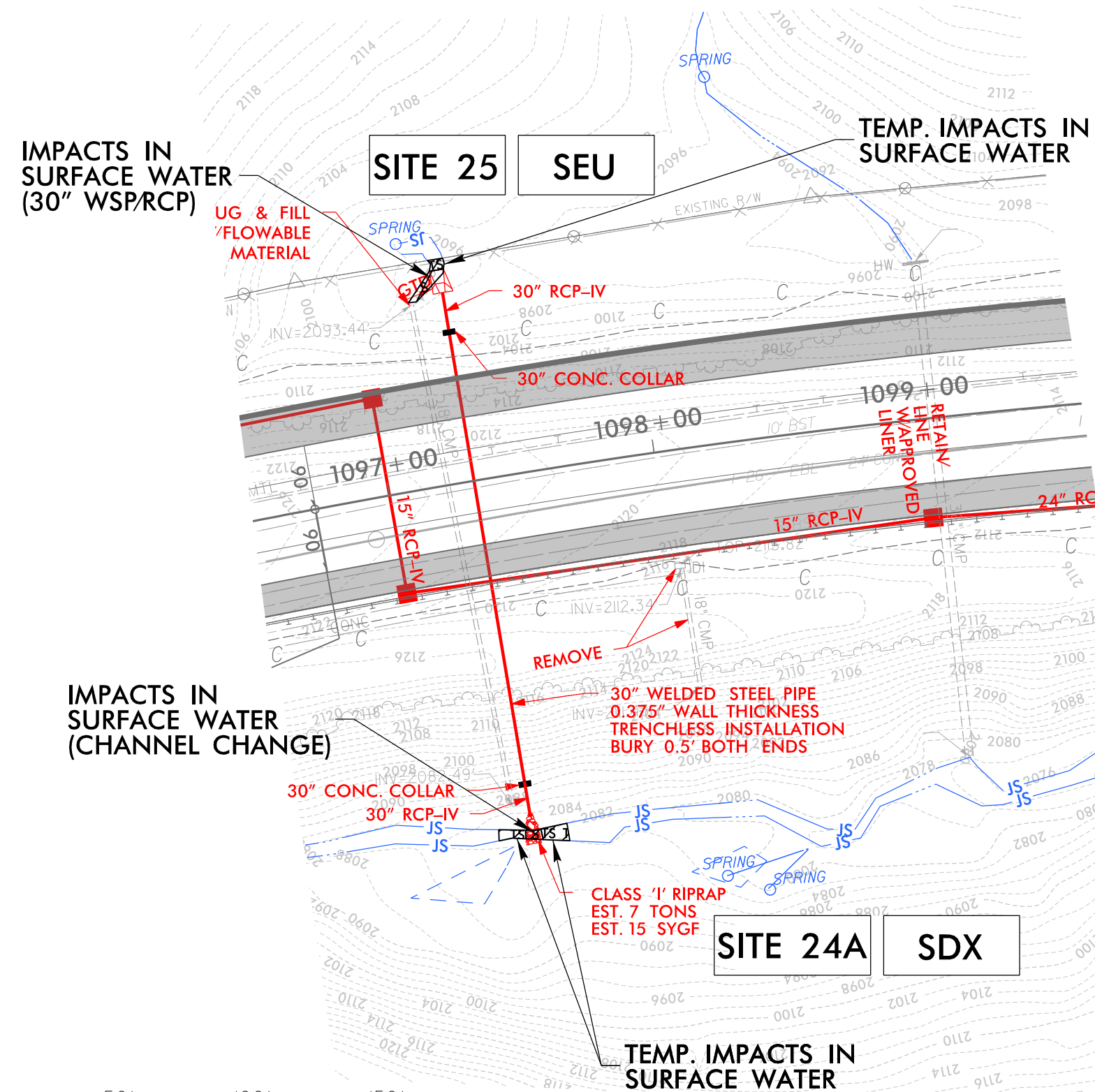
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER





PROJECT REFERENCE NO.	SHEET NO.
1-4700	24
RW SHEET NO.	1-4700B-34
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

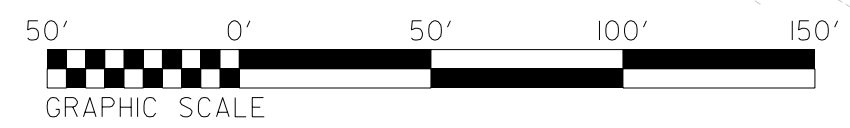


**PERMIT DRAWING  
SHEET 55 OF 97**



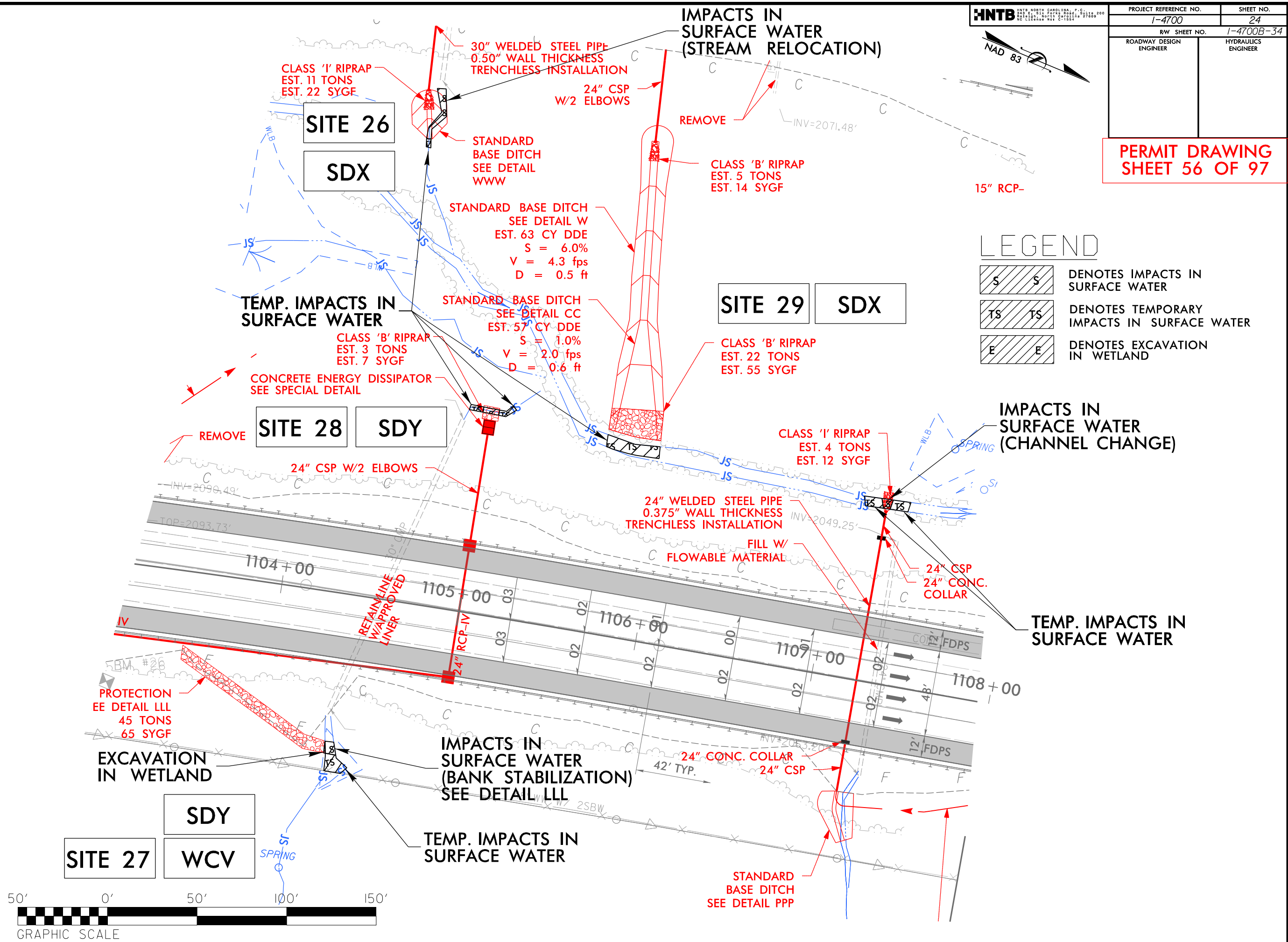
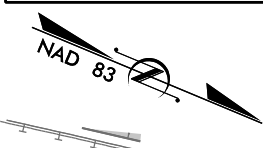
**LEGEND**

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



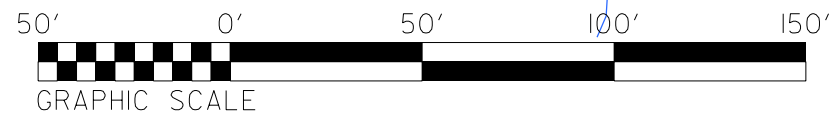
PROJECT REFERENCE NO. 1-4700	SHEET NO. 24
RW SHEET NO. 1-4700B-34	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

**PERMIT DRAWING  
SHEET 56 OF 97**



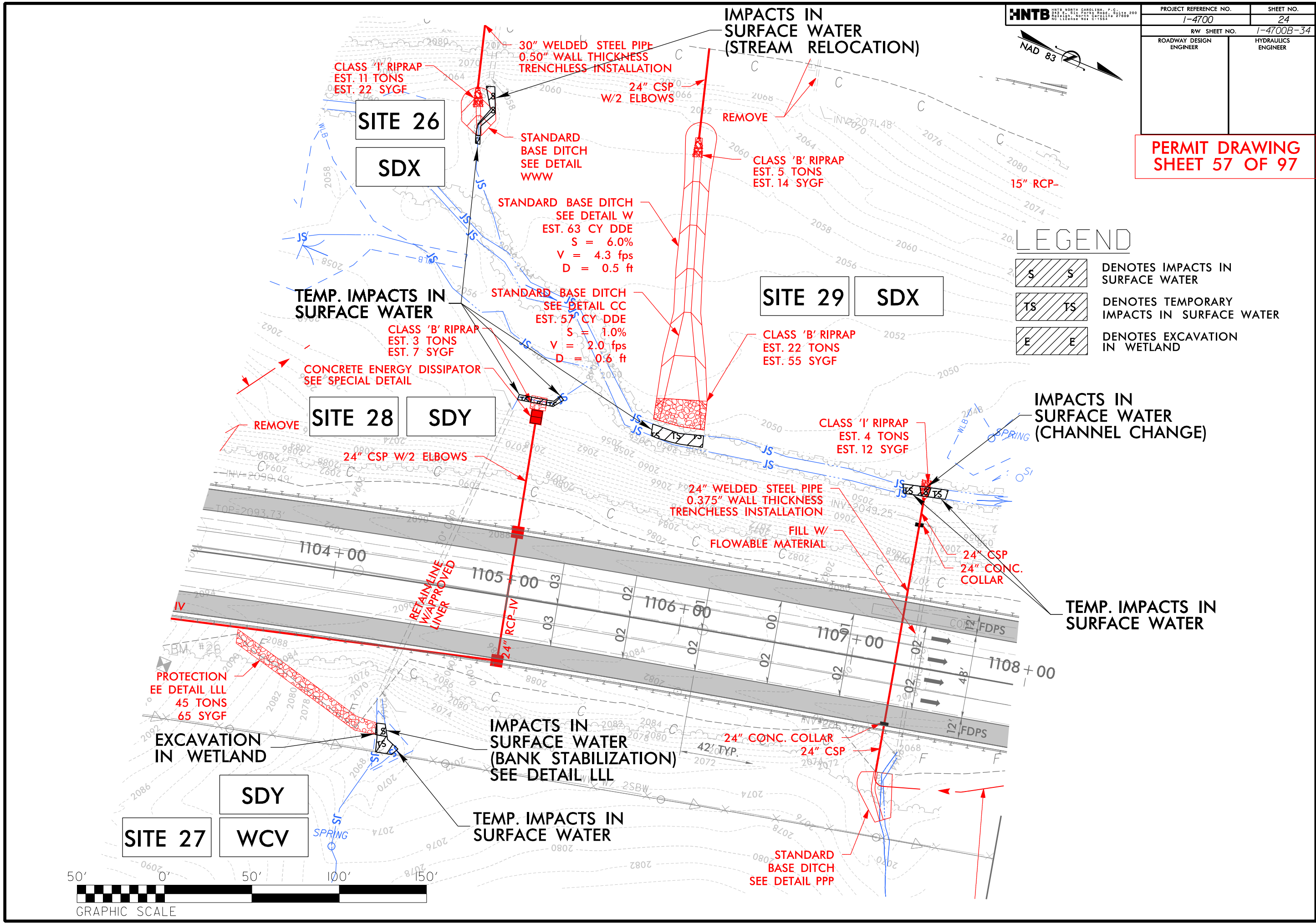
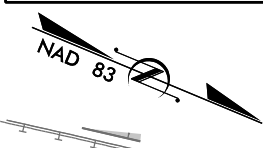
**LEGEND**

	DENOTES IMPACTS IN SURFACE WATER
	DENOTES TEMPORARY IMPACTS IN SURFACE WATER
	DENOTES EXCAVATION IN WETLAND



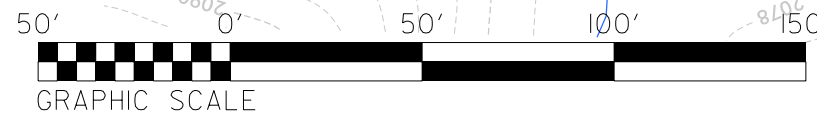
PROJECT REFERENCE NO.	SHEET NO.
1-4700	24
RW SHEET NO.	1-4700B-34
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

**PERMIT DRAWING  
SHEET 57 OF 97**



**LEGEND**

	DENOTES IMPACTS IN SURFACE WATER
	DENOTES TEMPORARY IMPACTS IN SURFACE WATER
	DENOTES EXCAVATION IN WETLAND



6/23/16

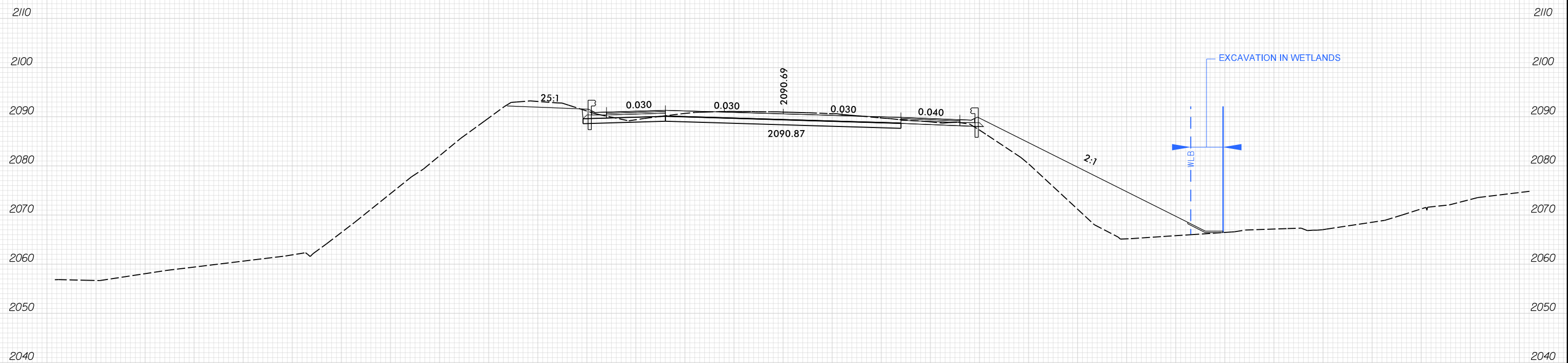
5 10

PROJ. REFERENCE NO.	SHEET NO.
I-4700	

**PERMIT DRAWING  
SHEET 58 OF 97**

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

# WETLAND CROSS SECTIONS



**SITE 27**  
-WBL- 1104 + 37.00

**SCALE**  
1"=20' HORIZONTAL  
1"=20' VERTICAL

BUNCOMBE & HENDERSON COUNTY  
PROJECT: I-4700  
I-26  
FROM 0.3 MI EAST OF NC 280 (AIRPORT RD.)  
TO 0.5 MI EAST OF NC 191 (BREVARD RD.)

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

11/14/2008  
I-4700B-HYD-PRM-XPL.dgn  
PWT/B

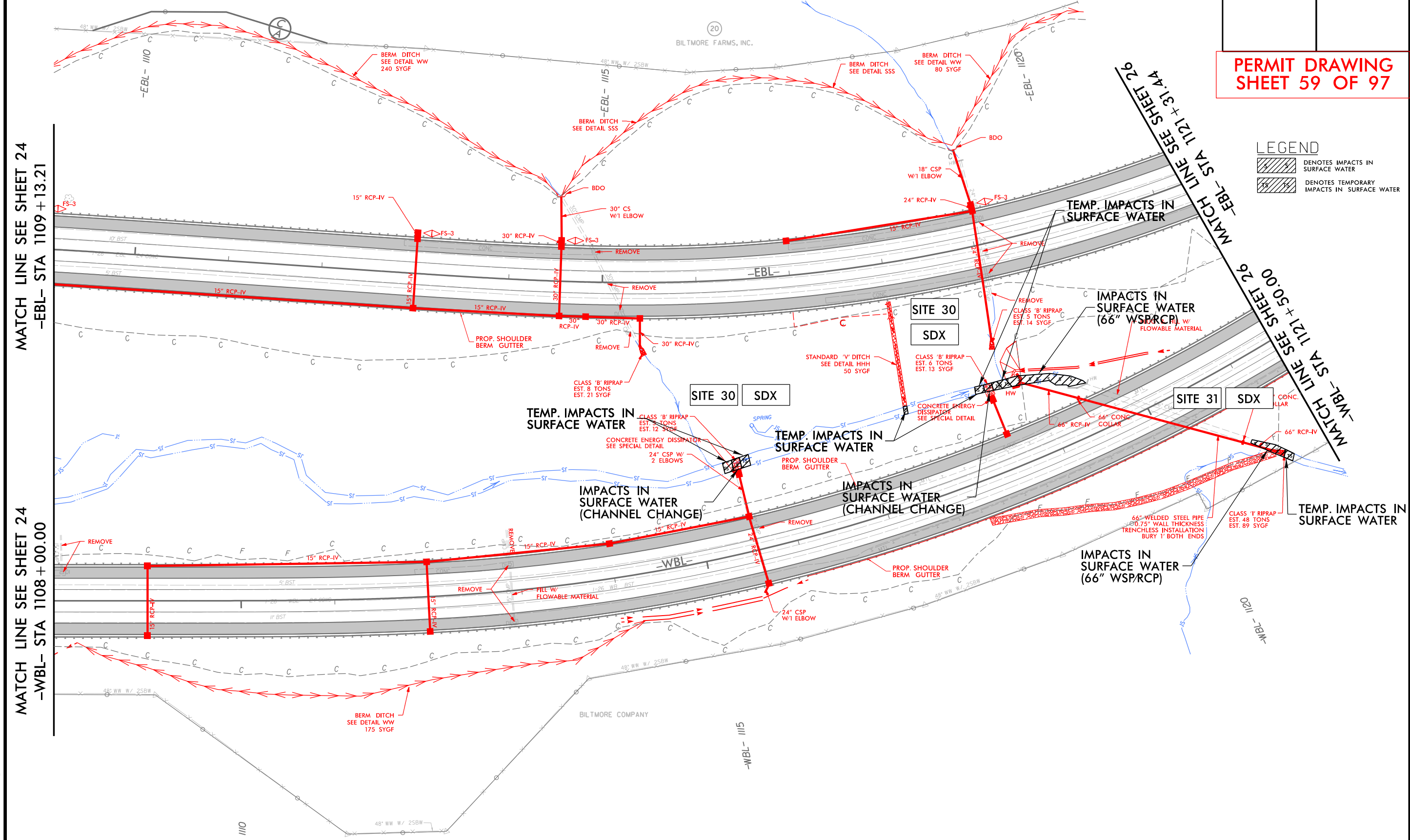
7/19/2017

HNTB HNTB NORTH CAROLINA, P.C.  
300 N. 25th Street, Suite 200  
Raleigh, North Carolina 27609  
NC License No. C-1355

PROJECT REFERENCE NO. 1-4700	SHEET NO. 25
RW SHEET NO. 1-4700B-35	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

**PERMIT DRAWING  
SHEET 59 OF 97**

# WETLAND & STREAM IMPACTS



**LEGEND**

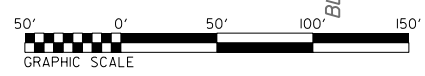
	DENOTES IMPACTS IN SURFACE WATER
	DENOTES TEMPORARY IMPACTS IN SURFACE WATER

MATCH LINE SEE SHEET 24  
-EBL- STA 1109 + 13.21

MATCH LINE SEE SHEET 24  
-WBL- STA 1108 + 00.00

MATCH LINE SEE SHEET 26  
-EBL- STA 1121 + 31.44

MATCH LINE SEE SHEET 26  
-WBL- STA 1121 + 50.00



FOR -WBL- & -EBL- PROFILES, SEE SHEETS 53 & 54  
 FOR RETAINING WALL -RW14-, SEE SHEETS W-15  
 FOR RETAINING WALL -RW15-, SEE SHEETS W-16

11/14/2018 11:47:08 AM HYD\_PRM\_PSH\_25.dgn

7/19/2017

PROJECT REFERENCE NO.	SHEET NO.
1-4700	25
RW SHEET NO.	1-4700B-35
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



# WETLAND & STREAM IMPACTS

**PERMIT DRAWING  
SHEET 60 OF 97**

**LEGEND**

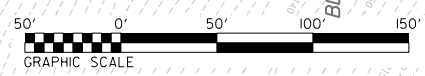
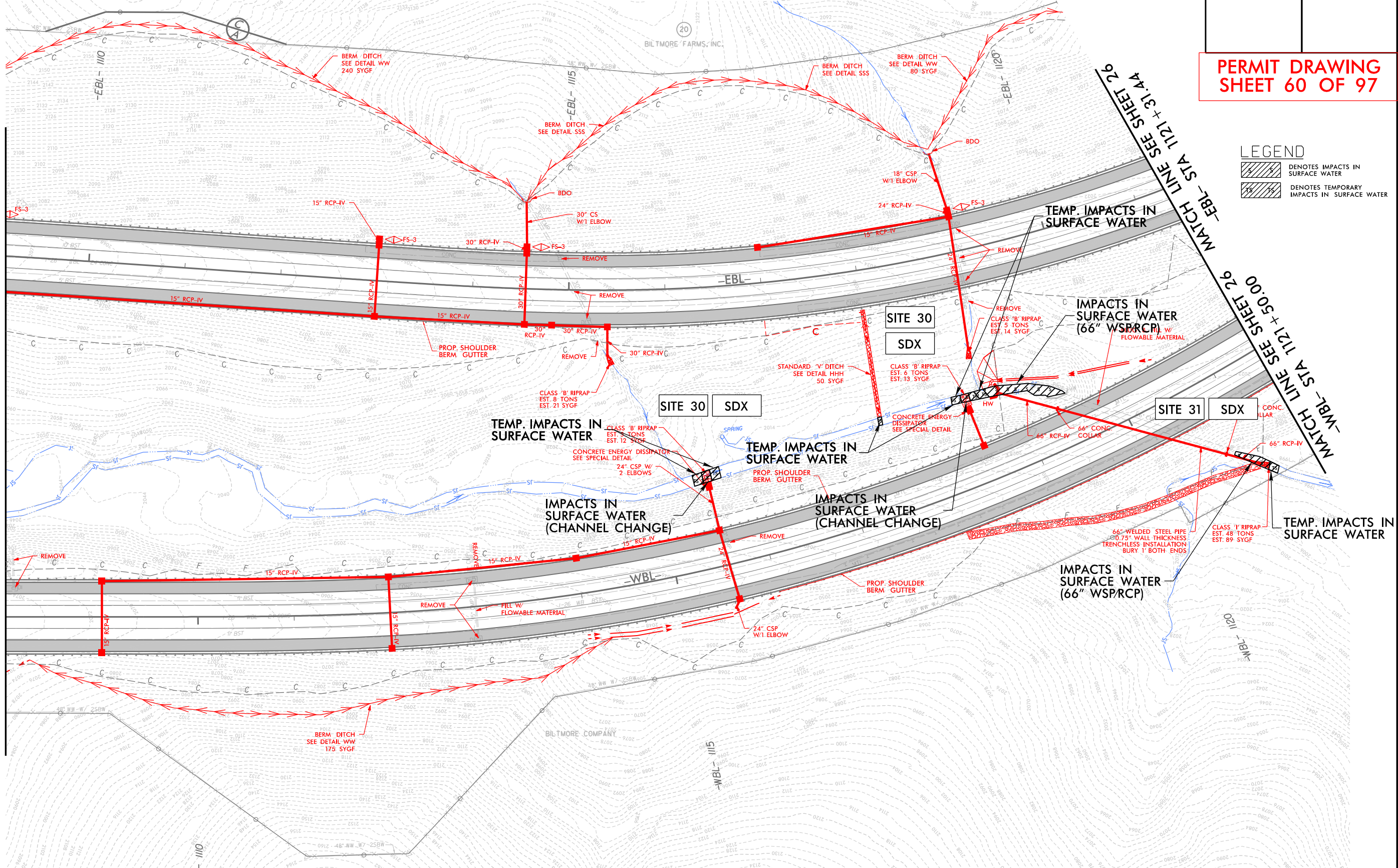
	DENOTES IMPACTS IN SURFACE WATER
	DENOTES TEMPORARY IMPACTS IN SURFACE WATER

MATCH LINE SEE SHEET 24  
-EBL- STA 1109 + 13.21

MATCH LINE SEE SHEET 24  
-WBL- STA 1108 + 00.00

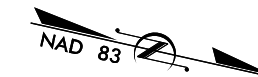
MATCH LINE SEE SHEET 26  
-EBL- STA 1121 + 31.44

MATCH LINE SEE SHEET 26  
-WBL- STA 1121 + 50.00



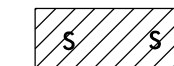
FOR -WBL- & -EBL- PROFILES, SEE SHEETS 53 & 54  
 FOR RETAINING WALL -RW14-, SEE SHEETS W-15  
 FOR RETAINING WALL -RW15-, SEE SHEETS W-16

11/14/2018 11:47:08 AM HYD\_PRM\_PSH\_25.dgn

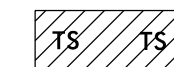


**PERMIT DRAWING  
SHEET 61 OF 97**

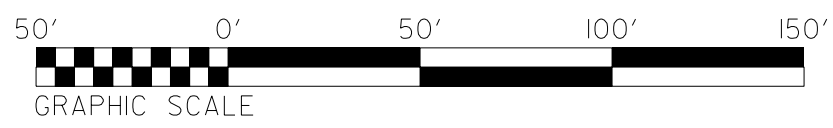
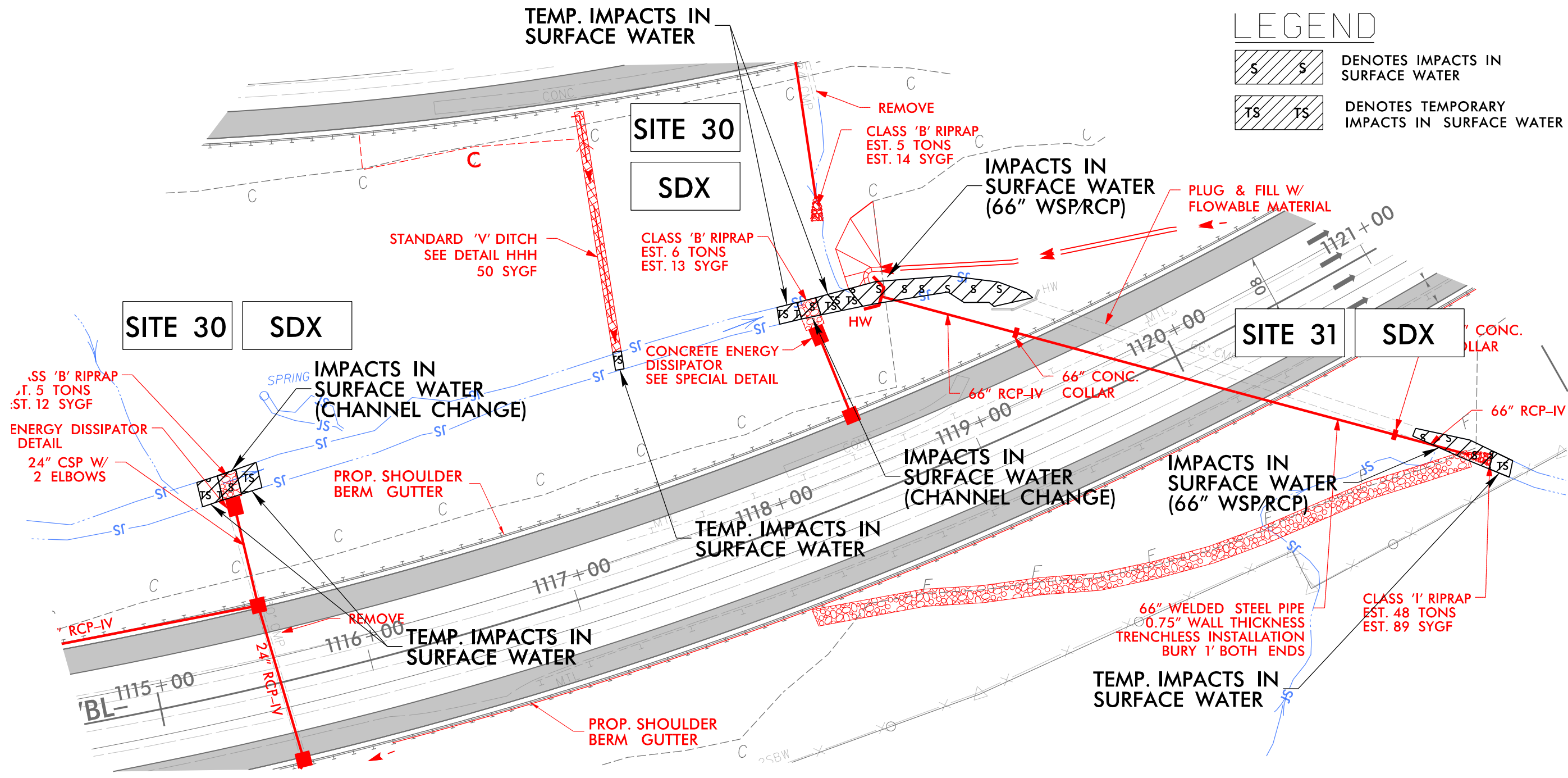
**LEGEND**

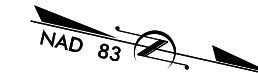


DENOTES IMPACTS IN SURFACE WATER



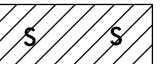

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

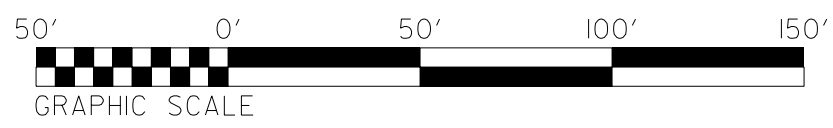
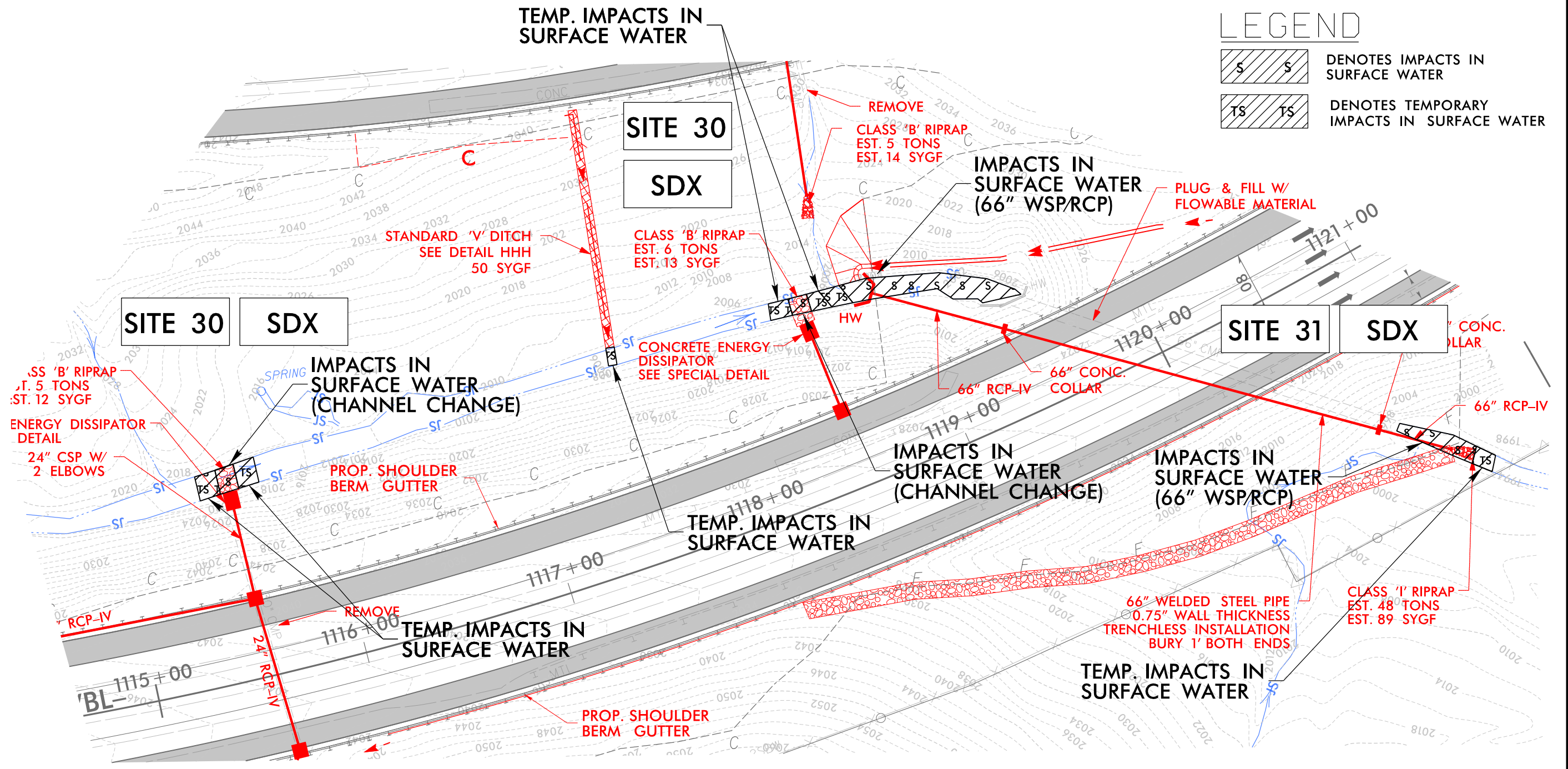




**PERMIT DRAWING  
SHEET 62 OF 97**

**LEGEND**

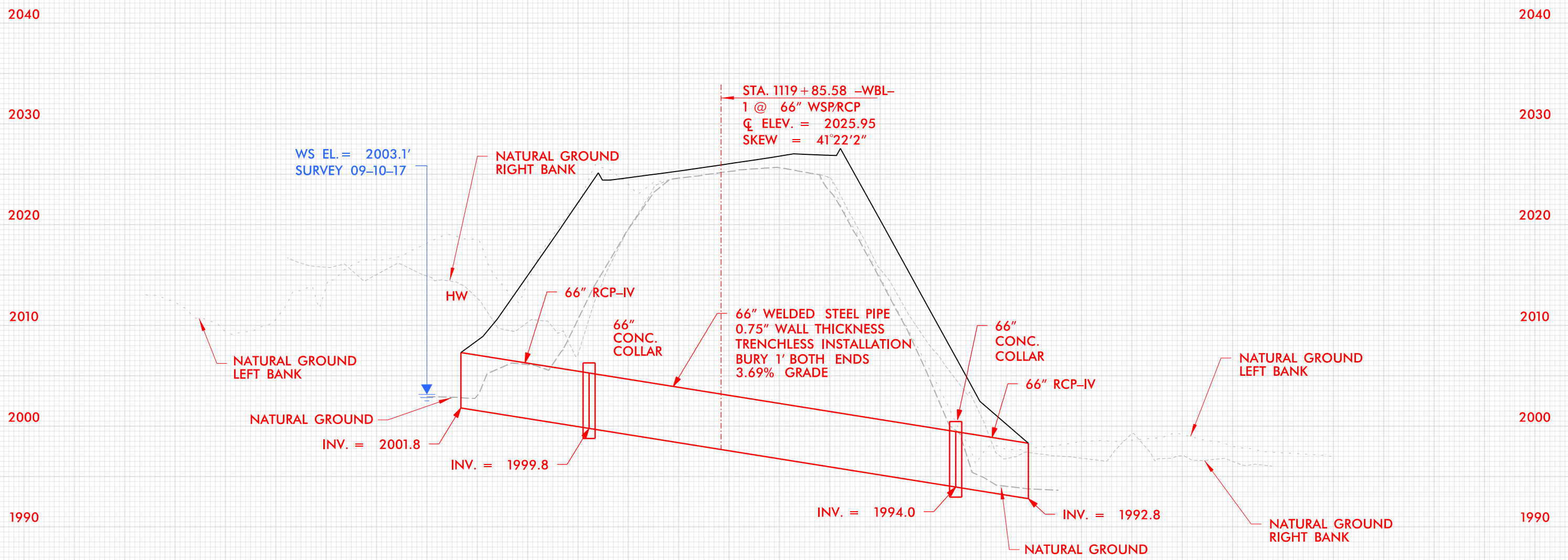
-  DENOTES IMPACTS IN SURFACE WATER
-  DENOTES TEMPORARY IMPACTS IN SURFACE WATER



6/23/16

**PERMIT DRAWING  
SHEET 63 OF 97**

250 200 150 100 50 0 50 100 150 200 250



WS EL. = 2003.1'  
SURVEY 09-10-17

STA. 1119 + 85.58 -WBL-  
1 @ 66" WSP/RCP  
CL ELEV. = 2025.95  
SKEW = 41°22'2"

NATURAL GROUND  
RIGHT BANK

NATURAL GROUND  
LEFT BANK

66" RCP-IV

66" CONC.  
COLLAR

66" WELDED STEEL PIPE  
0.75" WALL THICKNESS  
TRENCHLESS INSTALLATION  
BURY 1' BOTH ENDS  
3.69% GRADE

66" CONC.  
COLLAR

66" RCP-IV

NATURAL GROUND  
LEFT BANK

NATURAL GROUND  
INV. = 2001.8

INV. = 1999.8

INV. = 1994.0

INV. = 1992.8

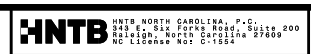
NATURAL GROUND

NATURAL GROUND  
RIGHT BANK

BUNCOMBE & HENDERSON COUNTY  
PROJECT: I-4700  
I-26  
FROM 0.3 MI EAST OF NC 280 (AIRPORT RD.)  
TO 0.5 MI EAST OF NC 191 (BREVARD RD.)

11/14/2016  
11:15:15  
I:\14700B\HYD\PRM\_PSH\_25B\_PFL.dgn

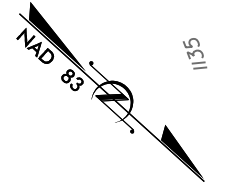
7/19/2017



PROJECT REFERENCE NO.	SHEET NO.
1-4700	26
RW SHEET NO.	1-4700B-36
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 64 OF 97

# WETLAND & STREAM IMPACTS

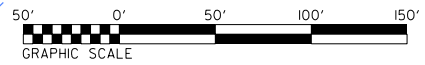
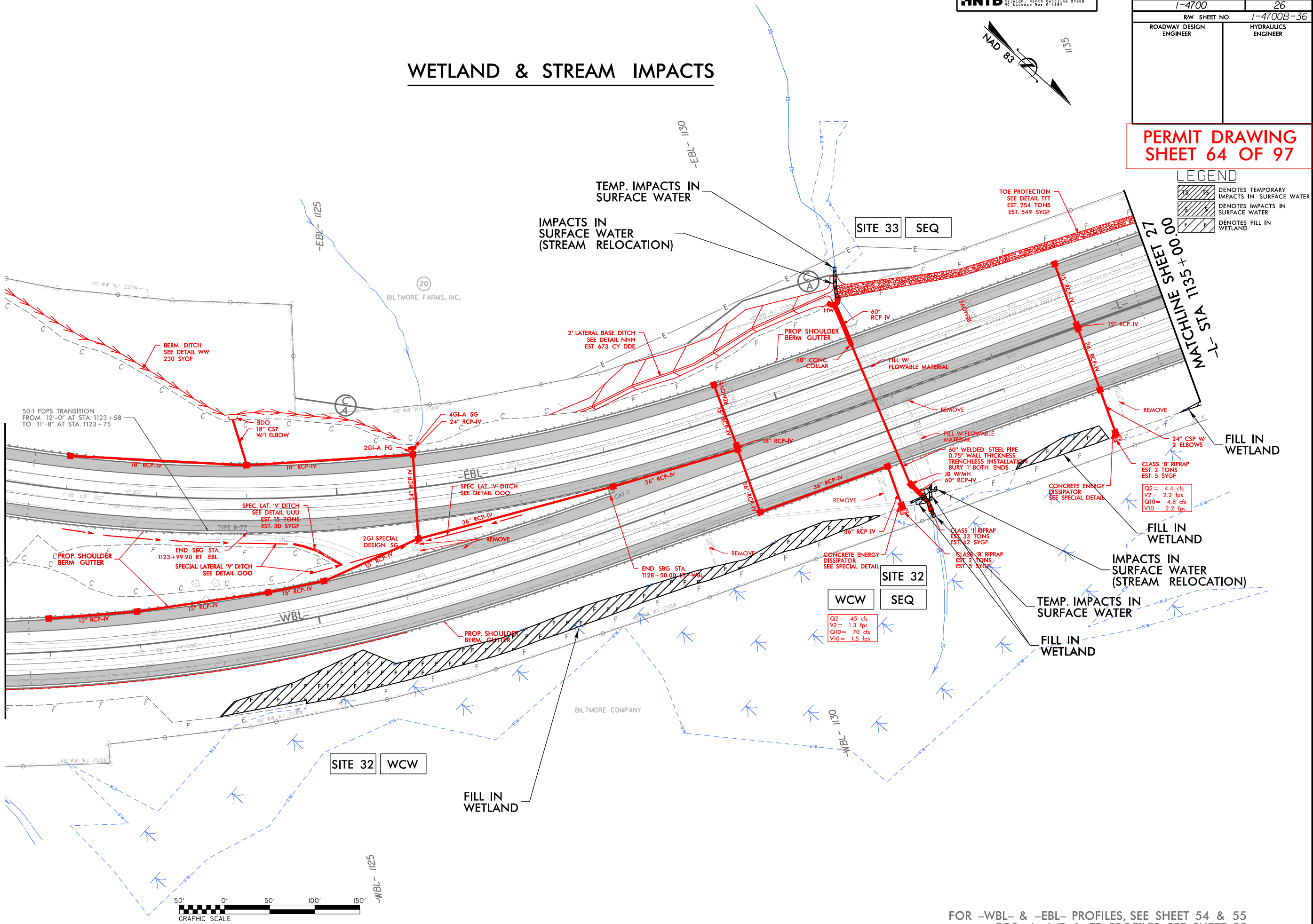


LEGEND

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

MATCHLINE SHEET 25  
-EBL- STA 1121 + 31.44

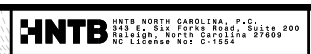
MATCHLINE SHEET 25  
-WBL- STA 1121 + 50.00



FOR -WBL- & -EBL- PROFILES, SEE SHEET 54 & 55  
FOR -L- WB & EB PROFILES, SEE SHEET 55

11/14/2018 11:47:08 AM HYD\_PRRM\_PSH\_26.dgn

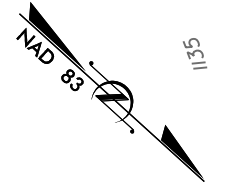
7/19/2017



PROJECT REFERENCE NO.	SHEET NO.
1-4700	26
RW SHEET NO.	1-4700B-36
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 65 OF 97

# WETLAND & STREAM IMPACTS



LEGEND

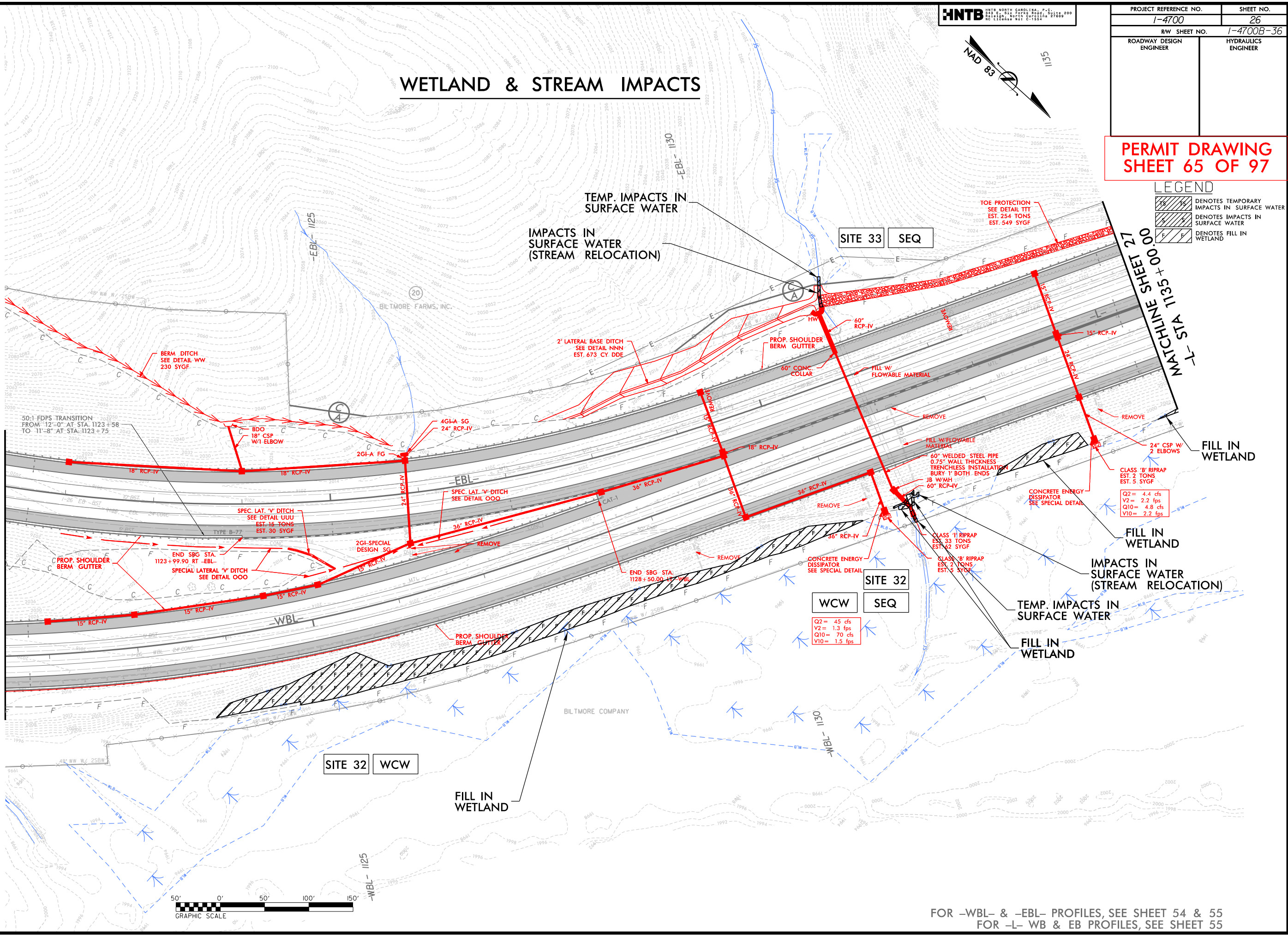
	DENOTES TEMPORARY IMPACTS IN SURFACE WATER
	DENOTES IMPACTS IN SURFACE WATER
	DENOTES FILL IN WETLAND

MATCHLINE SHEET 25  
-EBL- STA 1121 + 31.44

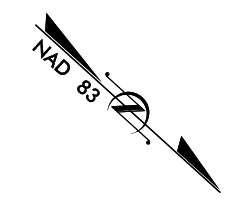
MATCHLINE SHEET 25  
-WBL- STA 1121 + 50.00

000 + 000  
MATCHLINE SHEET 27  
-L- STA 1131 + 31.11

11/14/2018 11:47:08B\_HYD\_PRR\_PSH\_26.dgn




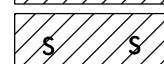
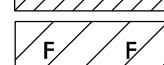
FOR -WBL- & -EBL- PROFILES, SEE SHEET 54 & 55  
FOR -L- WB & EB PROFILES, SEE SHEET 55

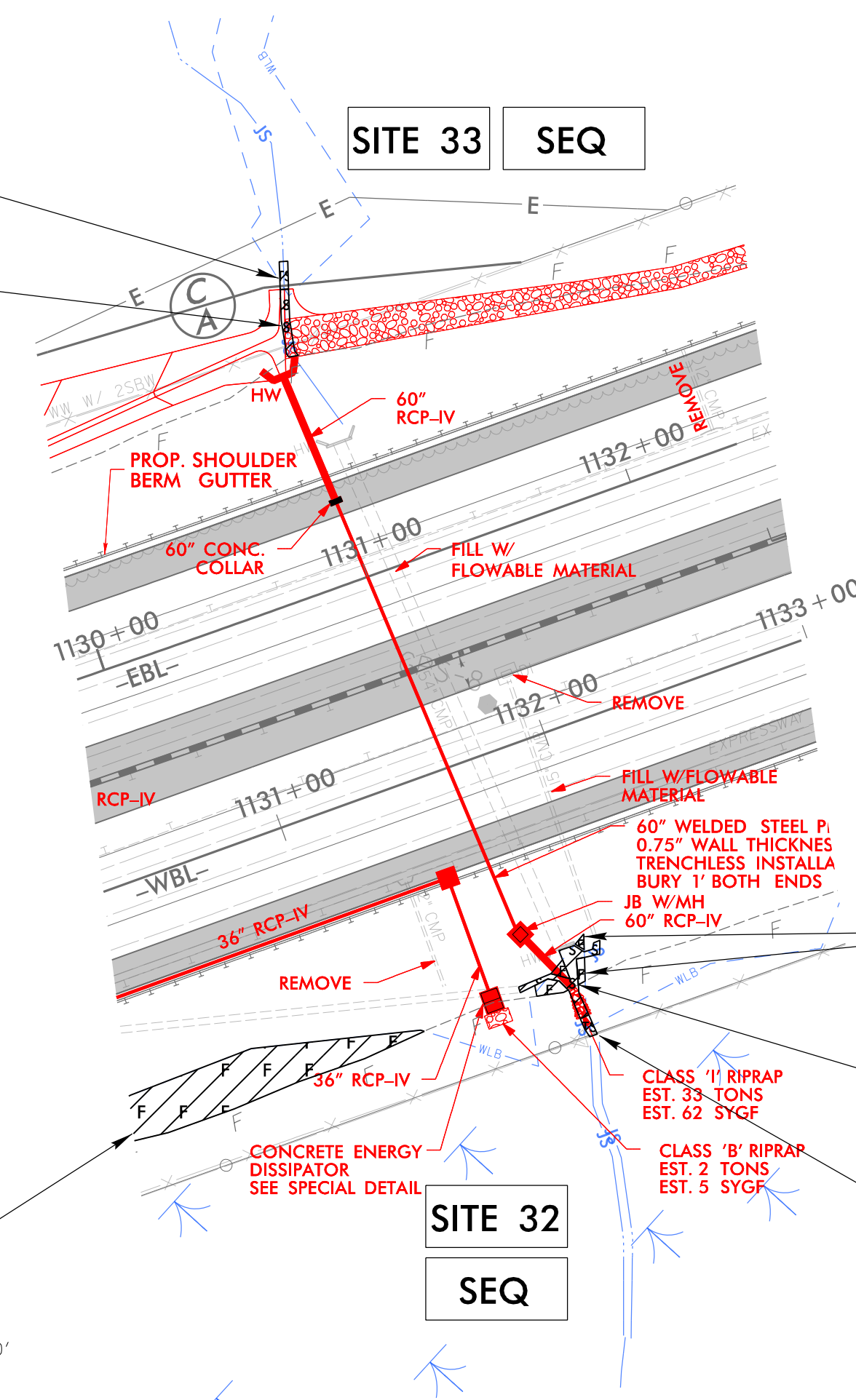


**SITE 33** **SEQ**

TEMP. IMPACTS IN SURFACE WATER  
 IMPACTS IN SURFACE WATER (STREAM RELOCATION)

**LEGEND**

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

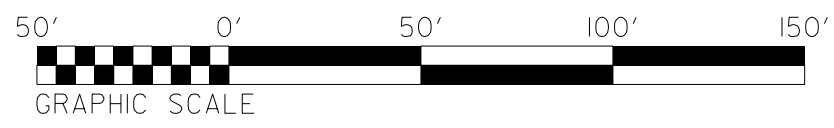


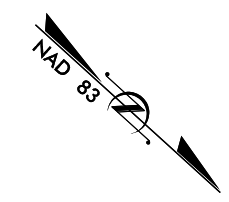
**SITE 32** **SEQ**

FILL IN WETLAND

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

FILL IN WETLAND



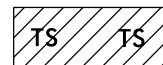
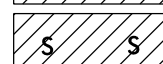
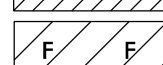


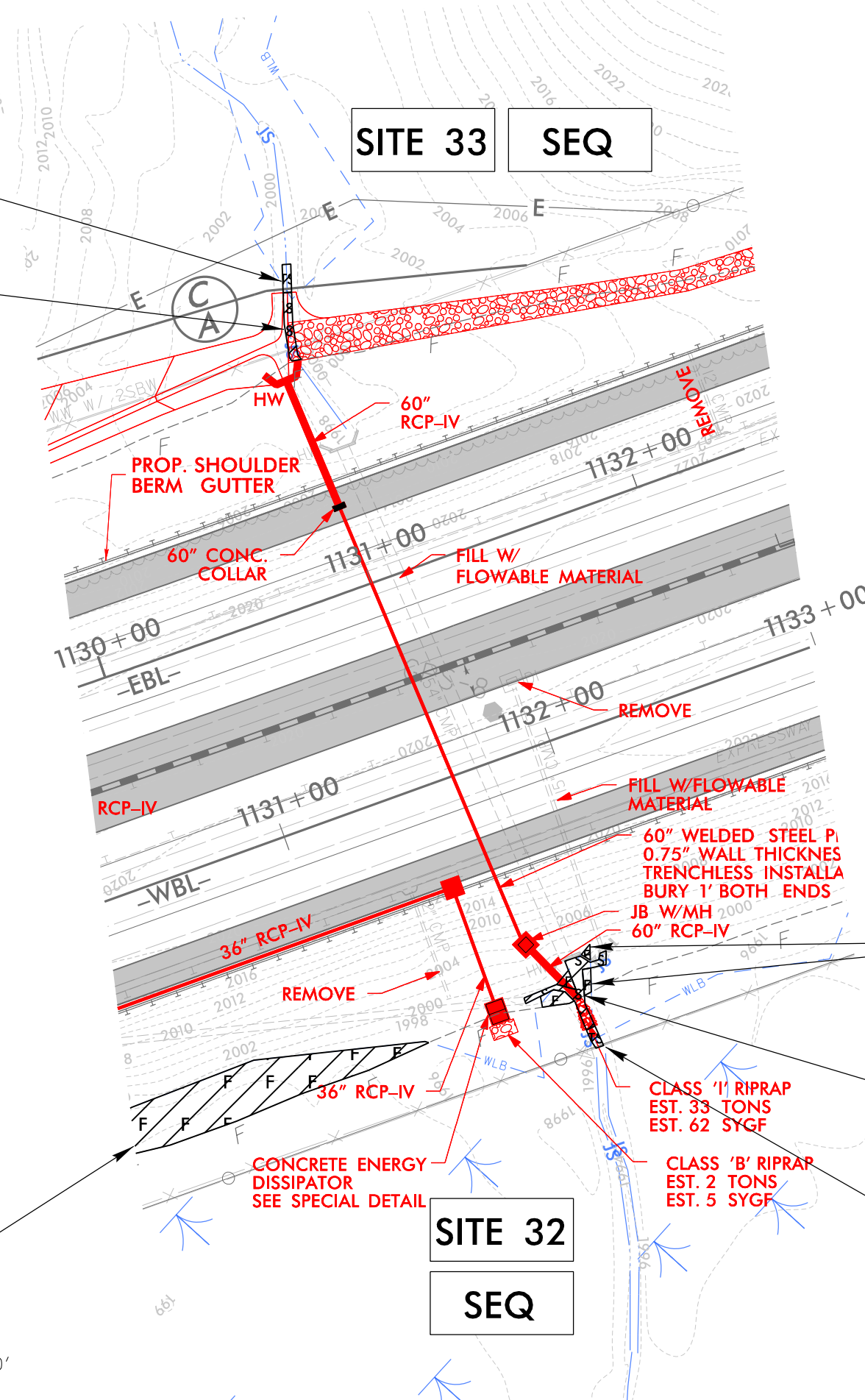
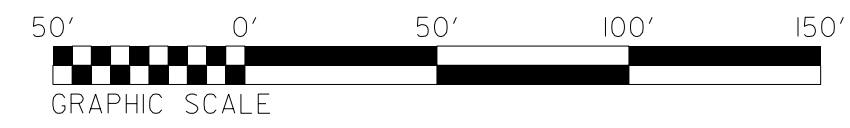
**SITE 33** **SEQ**

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

**LEGEND**

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



**SITE 32**  
**SEQ**

FILL IN WETLAND

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

FILL IN WETLAND

6/23/16

5 10

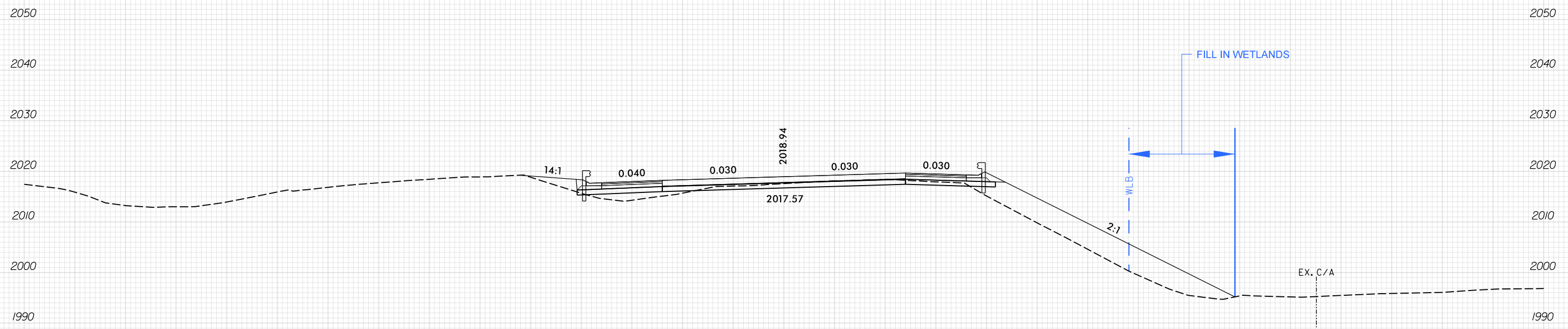
PROJ. REFERENCE NO.  
I-4700

SHEET NO.

**PERMIT DRAWING  
SHEET 68 OF 97**

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

# WETLAND CROSS SECTIONS



**SITE 32**  
-WBL- 1128 + 00.00

**SCALE**  
1"=20' HORIZONTAL  
1"=20' VERTICAL

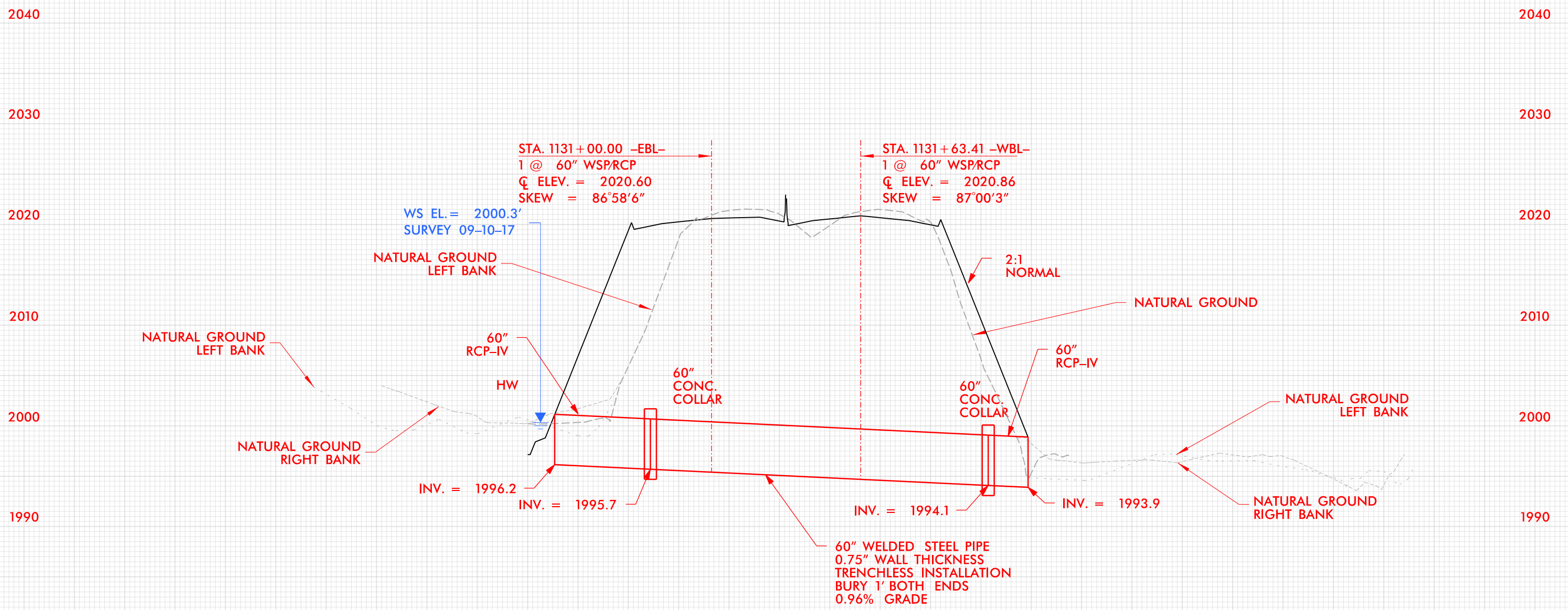
BUNCOMBE & HENDERSON COUNTY  
PROJECT: I-4700  
I-26  
FROM 0.3 MI EAST OF NC 280 (AIRPORT RD.)  
TO 0.5 MI EAST OF NC 191 (BREVARD RD.)

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

11/14/2008  
I-4700B-HYD-PRM\_XPL.dgn  
PWTB

6/23/16

250 200 150 100 50 0 50 100 150 200 250



# PROFILE

BUNCOMBE & HENDERSON COUNTY  
 PROJECT: I-4700  
 I-26  
 FROM 0.3 MI EAST OF NC 280 (AIRPORT RD.)  
 TO 0.5 MI EAST OF NC 191 (BREVARD RD.)

11/14/2016 11:47:00 AM I:\4700B-HYD-PRM\_PSH\_26\_PFL.dgn

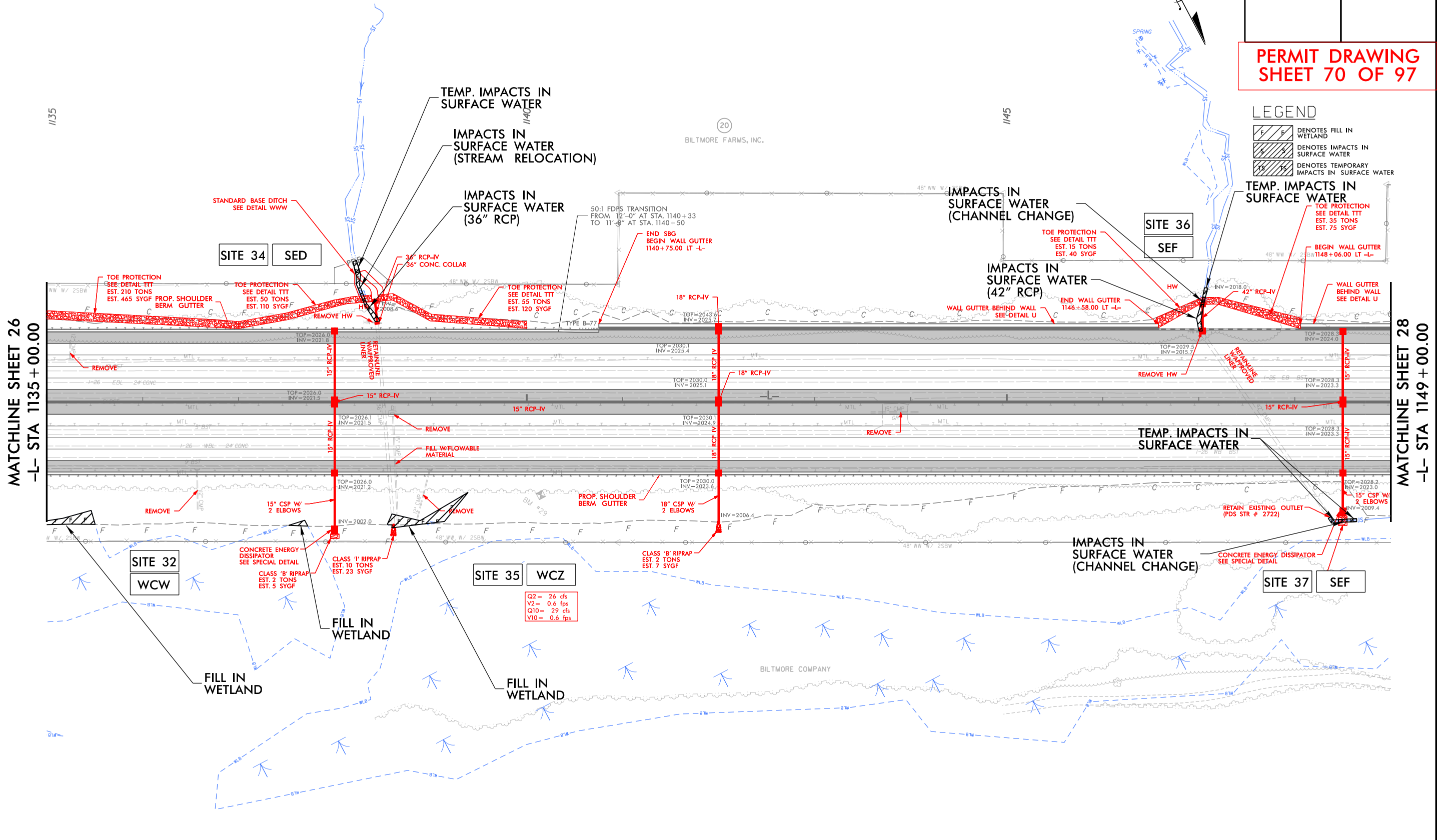
7/19/2017



PROJECT REFERENCE NO. 1-4700	SHEET NO. 27
RW SHEET NO. 1-4700B-37	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING  
SHEET 70 OF 97

# WETLAND & STREAM IMPACTS

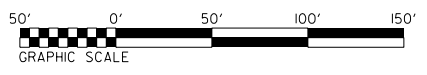


LEGEND

[Hatched Pattern]	DENOTES FILL IN WETLAND
[Hatched Pattern]	DENOTES IMPACTS IN SURFACE WATER
[Hatched Pattern]	DENOTES TEMPORARY IMPACTS IN SURFACE WATER

MATCHLINE SHEET 26  
-L- STA 1135 + 00.00

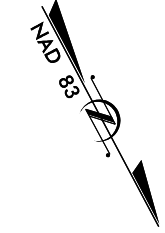
MATCHLINE SHEET 28  
-L- STA 1149 + 00.00



FOR -L- EB & -L- WB PROFILES, SEE SHEETS 55 & 56  
 FOR RETAINING WALL -RW16-, SEE SHEETS W-17  
 FOR RETAINING WALL -RW17-, SEE SHEETS W-18

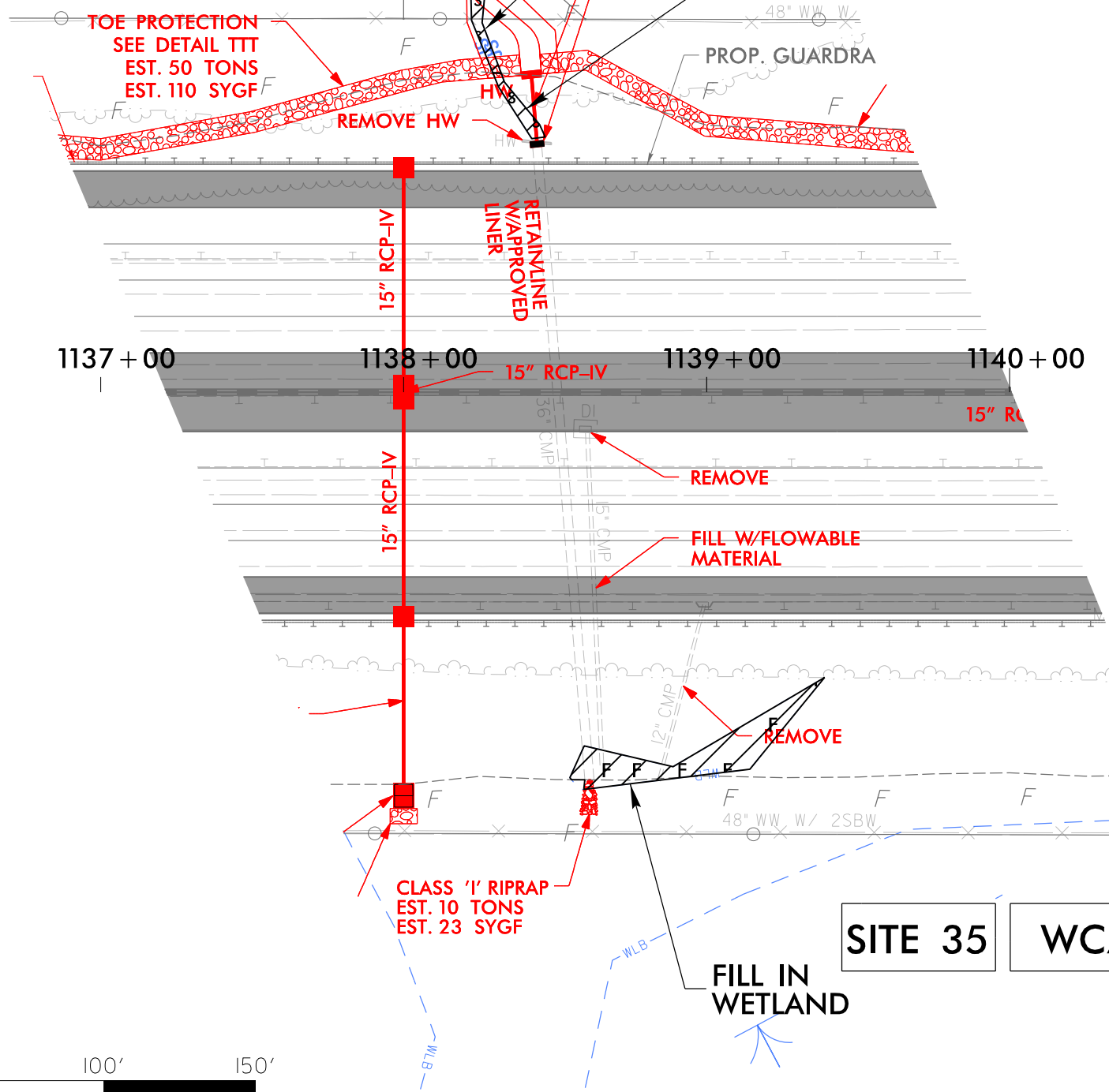
11/14/2018  
11/14/2018\_HYD\_PRM\_PSH\_27.dgn  
HNTB








TEMP. IMPACTS IN SURFACE WATER  
 IMPACTS IN SURFACE WATER (STREAM RELOCATION)  
 IMPACTS IN SURFACE WATER (36" RCP)

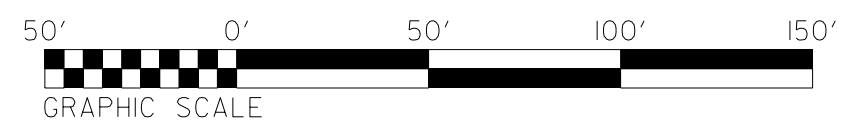
**SITE 34** **SED**



**LEGEND**

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

**SITE 35** **WCZ**

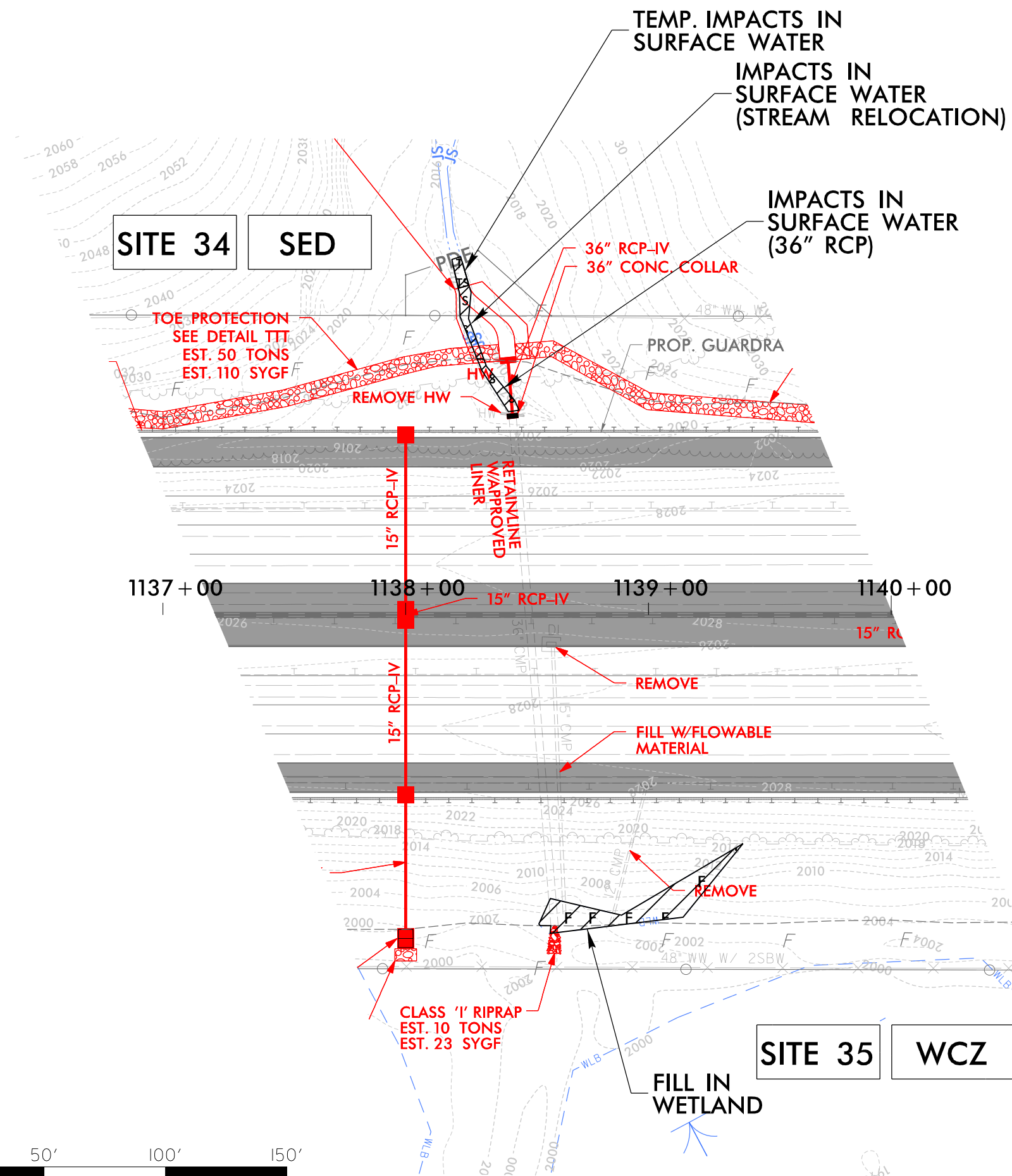
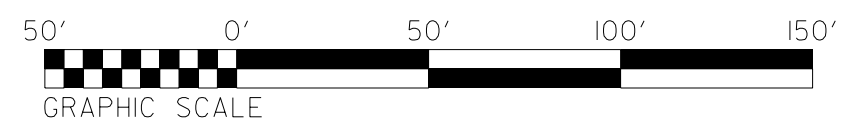


PROJECT REFERENCE NO. 1-4700	SHEET NO. 27
RW SHEET NO. 1-4700B-37	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

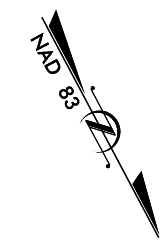
**PERMIT DRAWING  
SHEET 73 OF 97**

**LEGEND**

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



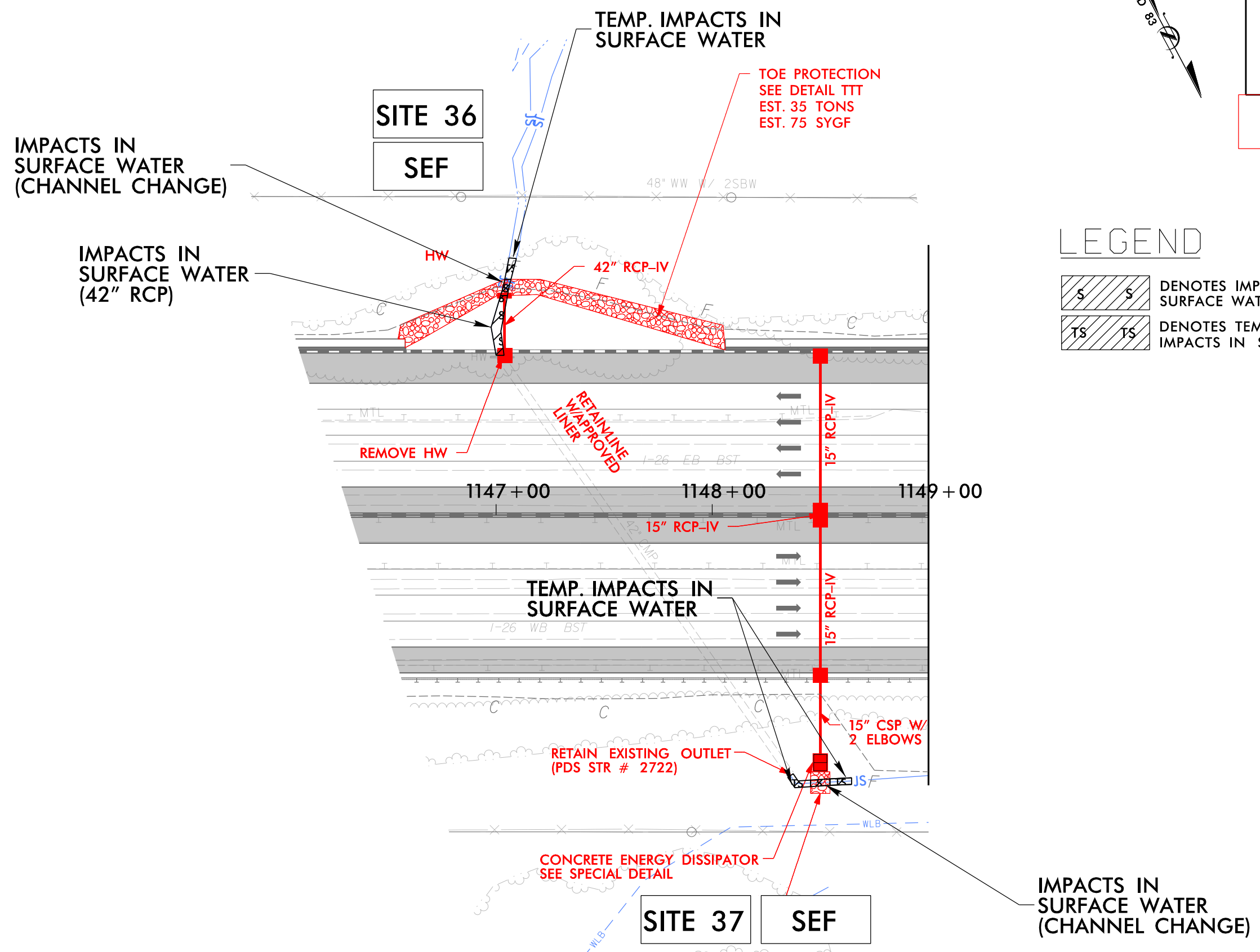
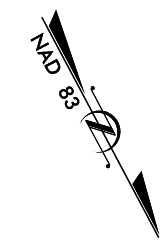
TEMP. IMPACTS IN SURFACE WATER  
 IMPACTS IN SURFACE WATER (STREAM RELOCATION)  
 IMPACTS IN SURFACE WATER (36" RCP)





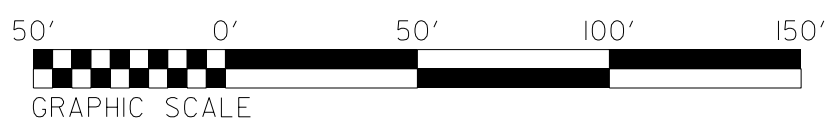
PROJECT REFERENCE NO. 1-4700	SHEET NO. 27
RW SHEET NO. 1-4700B-37	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

**PERMIT DRAWING  
SHEET 75 OF 97**



**LEGEND**

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





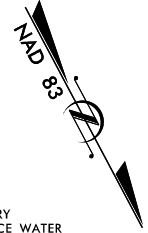
7/19/2017

PERMIT DRAWING SHEET 77 OF 97

# WETLAND & STREAM IMPACTS

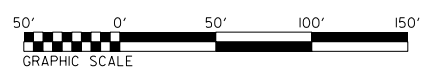
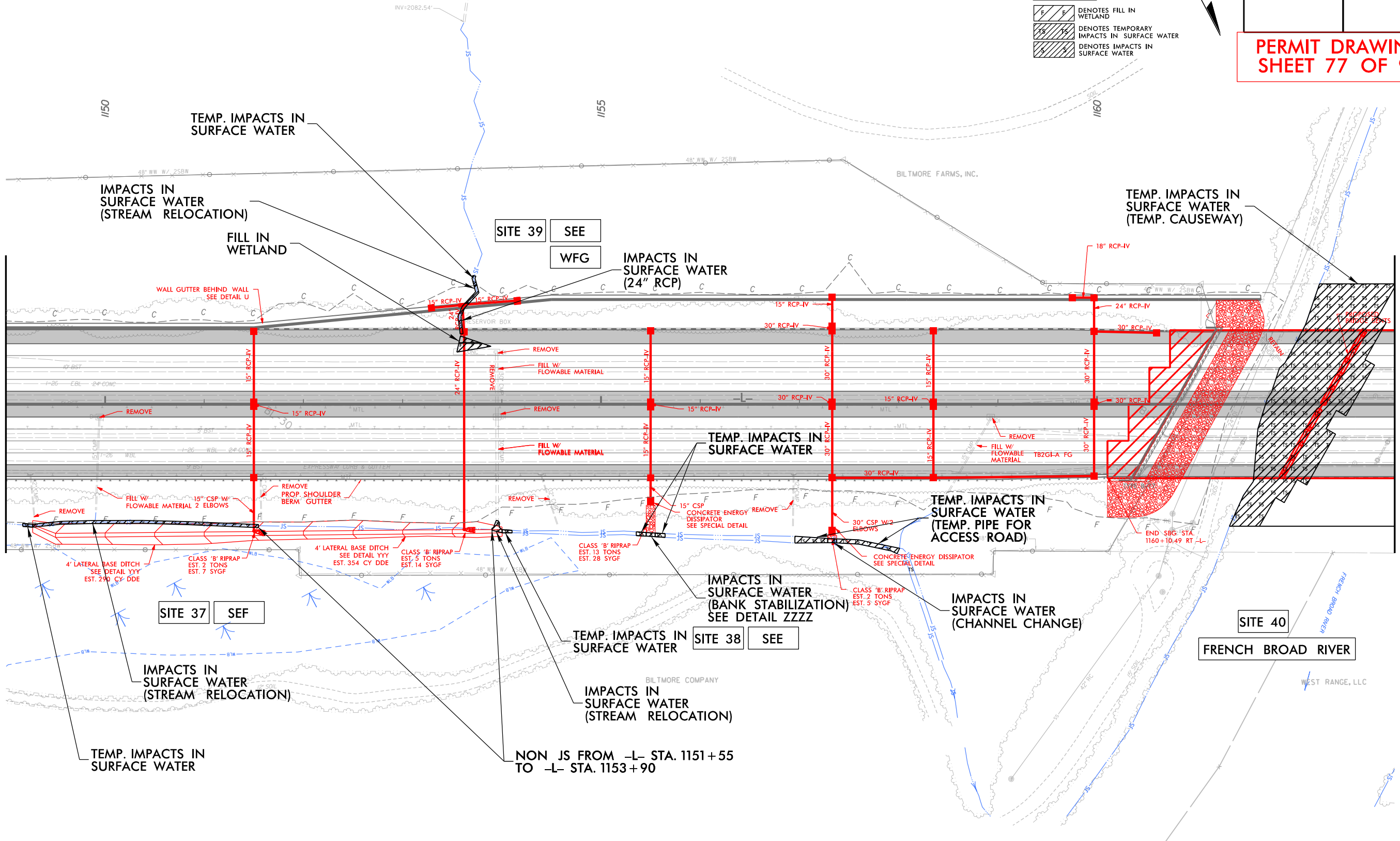
**LEGEND**

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



MATCHLINE SHEET 27  
-L- STA 1149 + 00.00

MATCHLINE SHEET 29  
-L- STA 1163 + 00.00



FOR -L- EB & -L- WB PROFILES, SEE SHEETS 56 & 57  
FOR RETAINING WALL -RW17-, SEE SHEETS W-18

11/14/2018 11:47:08 AM HYD\_PRM\_PSH\_28.dgn

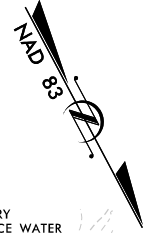
7/19/2017

PERMIT DRAWING SHEET 78 OF 97

# WETLAND & STREAM IMPACTS

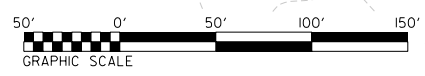
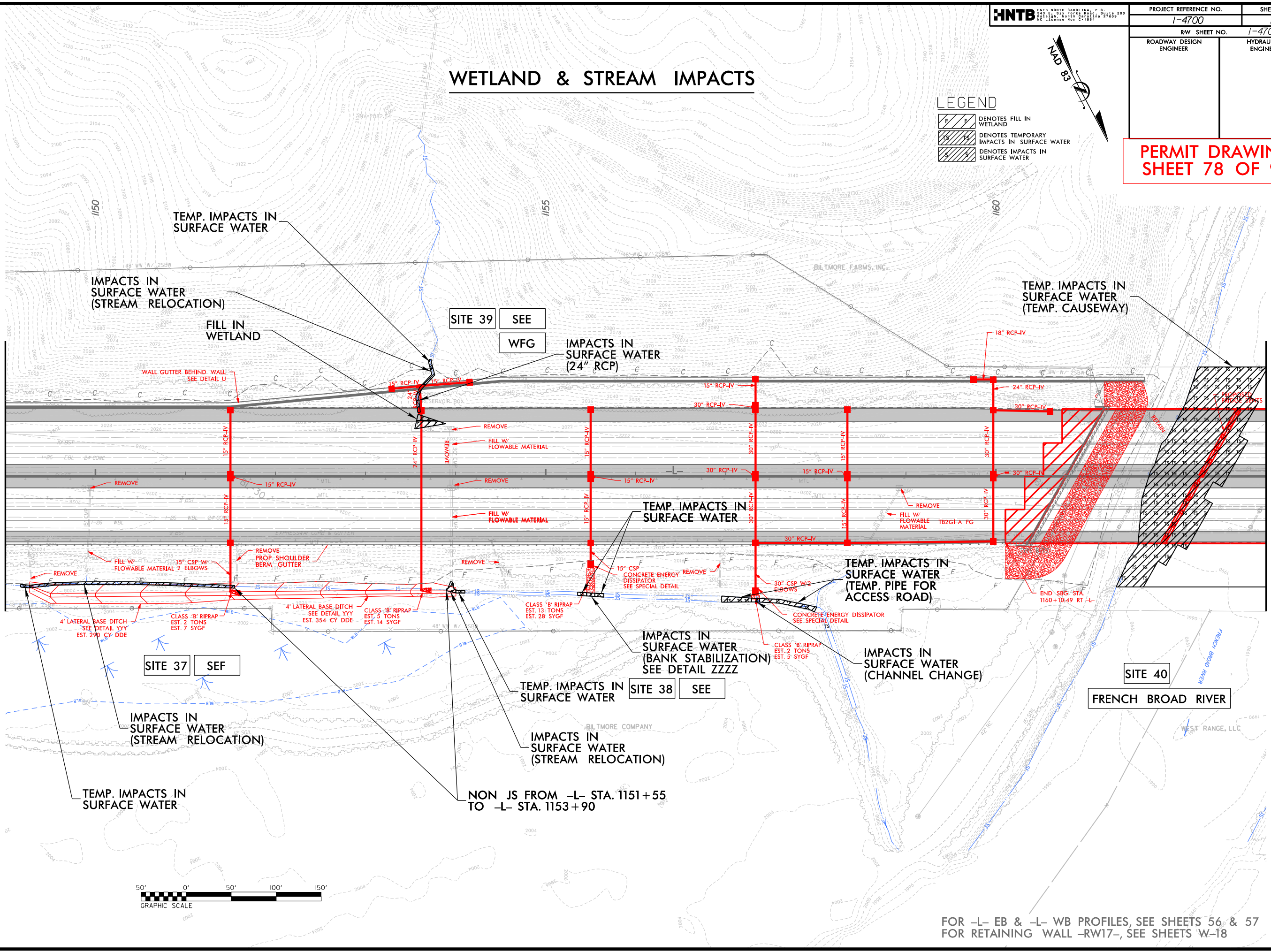
**LEGEND**

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



MATCHLINE SHEET 27  
-L- STA 1149 + 00.00

MATCHLINE SHEET 29  
-L- STA 1163 + 00.00



FOR -L- EB & -L- WB PROFILES, SEE SHEETS 56 & 57  
FOR RETAINING WALL -RW17-, SEE SHEETS W-18

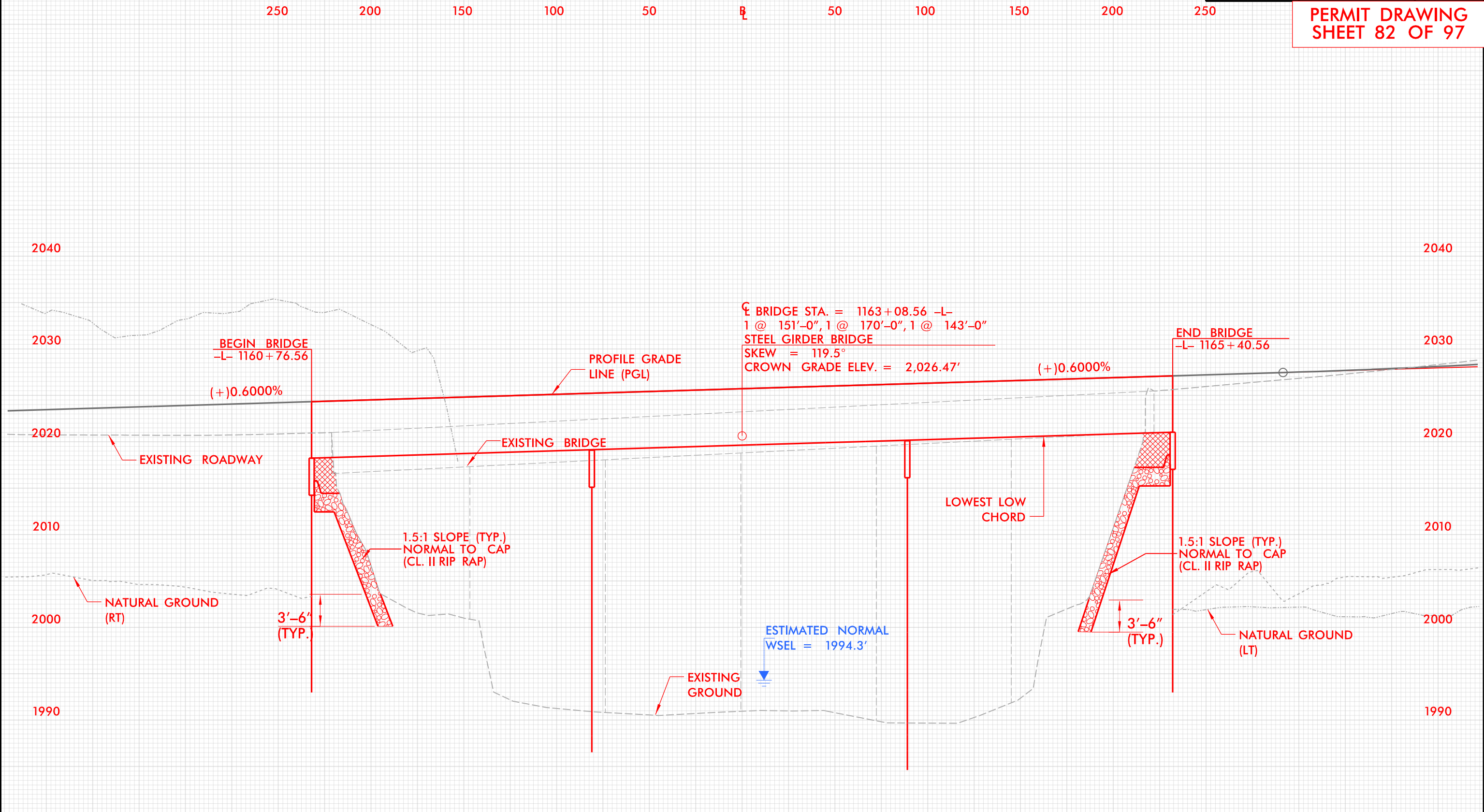
11/14/2018  
11/14/2018  
HYD\_PRM\_PSH\_28.dgn







6/23/16



**PROFILE**

BUNCOMBE & HENDERSON COUNTY  
PROJECT: I-4700  
I-26  
FROM 0.3 MI EAST OF NC 280 (AIRPORT RD.)  
TO 0.5 MI EAST OF NC 191 (BREVARD RD.)

11/14/2016  
11:47:00 AM  
HYD\_PRM\_PSH\_29A\_BPFL.dgn  
HNTB

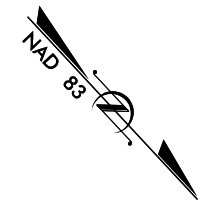
7/19/2017

HNTB  
HNTB NORTH CAROLINA, P.C.  
300 S. 10TH STREET, SUITE 200  
Raleigh, NC 27601  
Tel: 919.487.1100 Fax: 919.487.1101

PROJECT REFERENCE NO. 1-4700	SHEET NO. 30
RW SHEET NO. 1-4700B-40	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

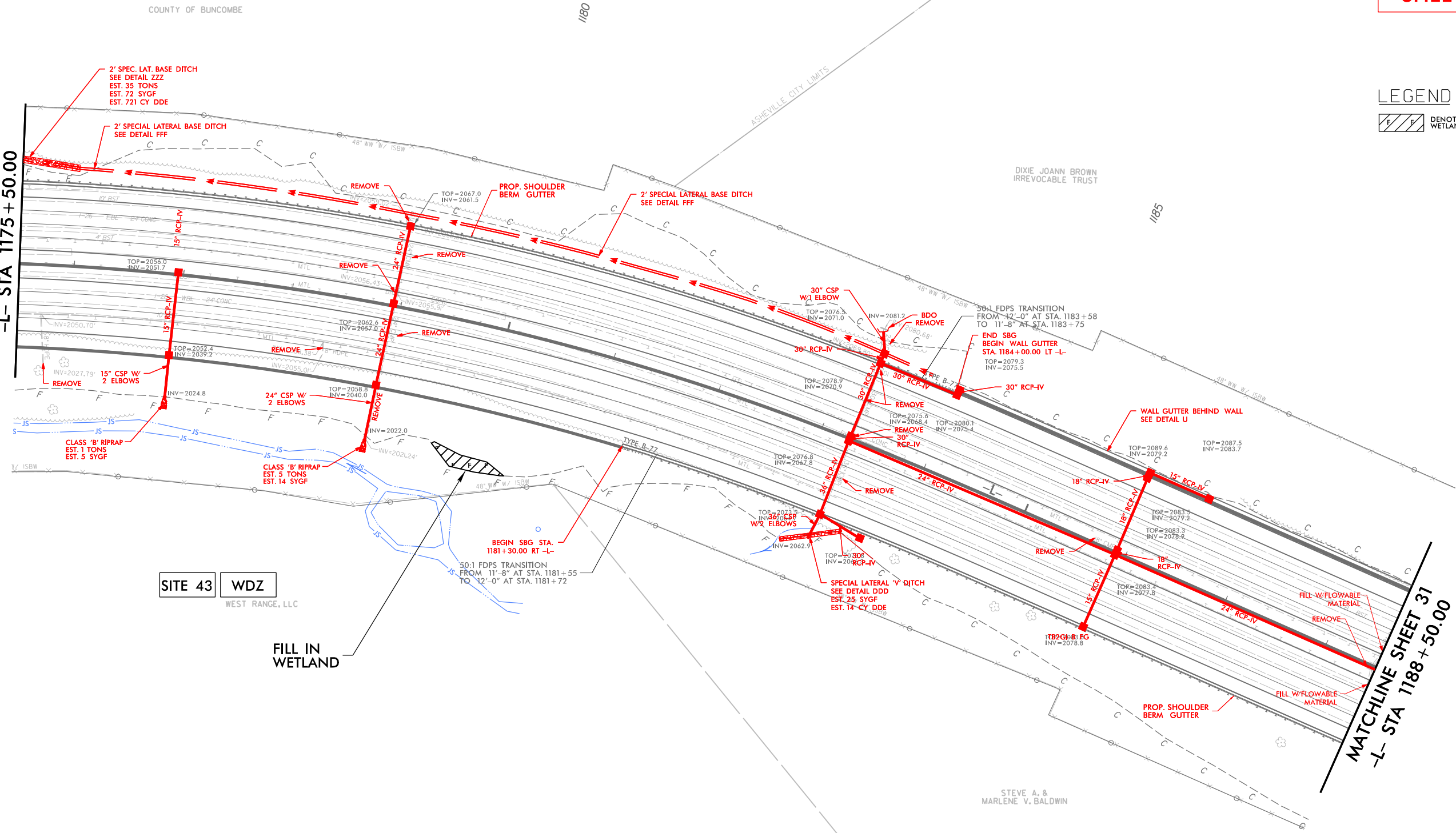
**PERMIT DRAWING  
SHEET 83 OF 97**

# WETLAND & STREAM IMPACTS



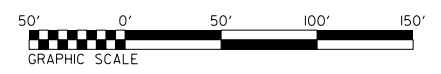
MATCHLINE SHEET 29  
-L- STA 1175 + 50.00

MATCHLINE SHEET 31  
-L- STA 1188 + 50.00



**LEGEND**

DENOTES FILL IN WETLAND



FOR -L- EB & -L- WB PROFILES, SEE SHEETS 58 & 59  
 FOR RETAINING WALL -RW20-, SEE SHEETS W-21  
 FOR RETAINING WALL -RW21-, SEE SHEETS W-22

11/14/2018 11:47:08 AM HYD\_PRM\_PSH\_30.dgn

COUNTY OF BUNCOMBE

1180

ASHEVILLE CITY LIMITS

DIXIE JOANN BROWN  
IRREVOCABLE TRUST

1185

SITE 43 WDW  
WEST RANGE, LLC

FILL IN WETLAND

STEVE A. &  
MARLENE V. BALDWIN

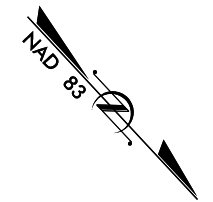
7/19/2017



PROJECT REFERENCE NO.	SHEET NO.
1-4700	30
RW SHEET NO.	1-4700B-40
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 84 OF 97

# WETLAND & STREAM IMPACTS

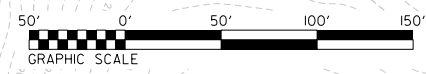
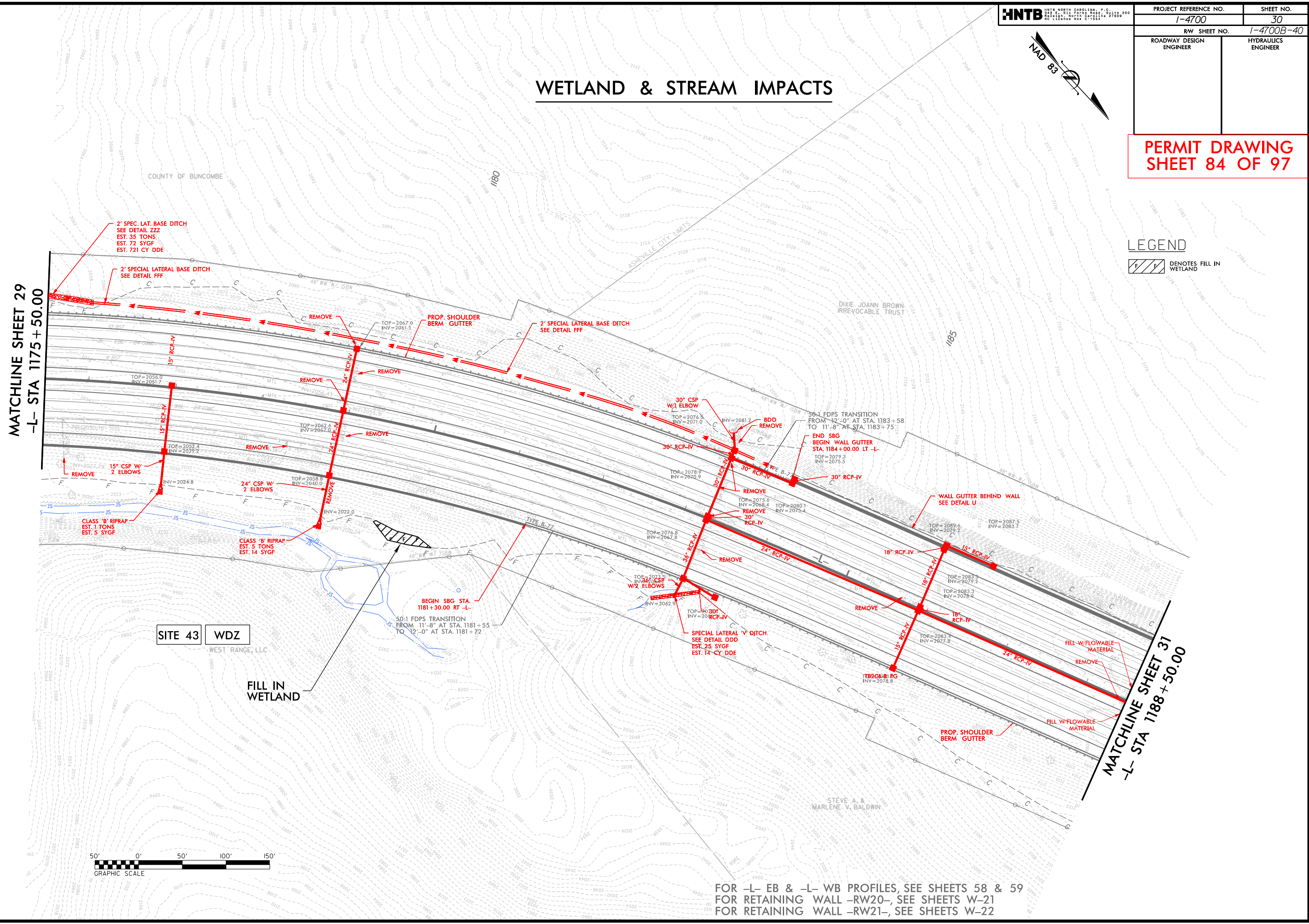


LEGEND

DENOTES FILL IN WETLAND

MATCHLINE SHEET 29  
-L- STA 1175 + 50.00

MATCHLINE SHEET 31  
-L- STA 1188 + 50.00



FOR -L- EB & -L- WB PROFILES, SEE SHEETS 58 & 59  
 FOR RETAINING WALL -RW21-, SEE SHEETS W-21  
 FOR RETAINING WALL -RW22-, SEE SHEETS W-22

11/14/2018  
11/14/2018\_HYD\_PRR\_PSH\_30.dgn  
HNTB

6/23/16

5 10  
100 110

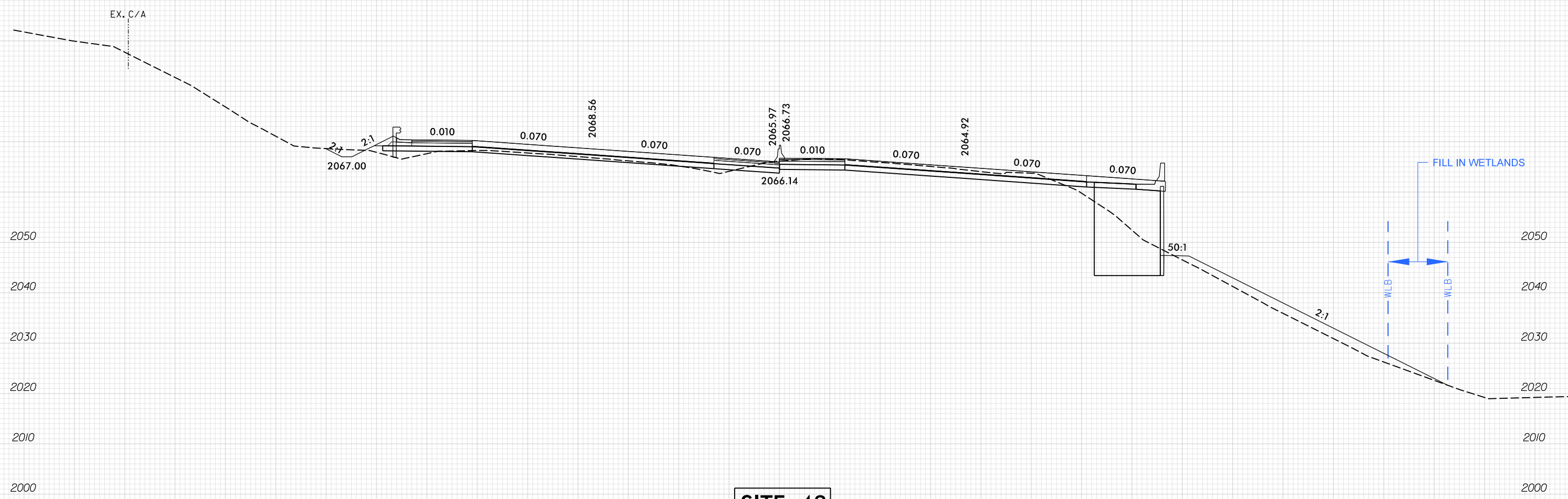
PROJ. REFERENCE NO.  
I-4700

SHEET NO.

**PERMIT DRAWING  
SHEET 85 OF 97**

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

# WETLAND CROSS SECTIONS



**SITE 43**  
-L3- 1180 + 00.00

**SCALE**  
1"=20' HORIZONTAL  
1"=20' VERTICAL

BUNCOMBE & HENDERSON COUNTY  
PROJECT: I-4700  
I-26  
FROM 0.3 MI EAST OF NC 280 (AIRPORT RD.)  
TO 0.5 MI EAST OF NC 191 (BREVARD RD.)

11/14/2008  
I-4700B-HYD-PRM-XPL.dgn  
PNTB

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

7/19/2017

HNTB HNTB NORTH CAROLINA, P.C.  
2000 W. GOLF COURSE ROAD, SUITE 200  
RANDOLPH COUNTY, NORTH CAROLINA 27859  
REG. LICENSE NO. C-1555

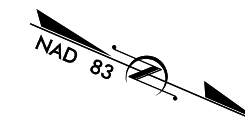
PROJECT REFERENCE NO. SHEET NO.

1-4700 31

RW SHEET NO. 1-4700B-41

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER



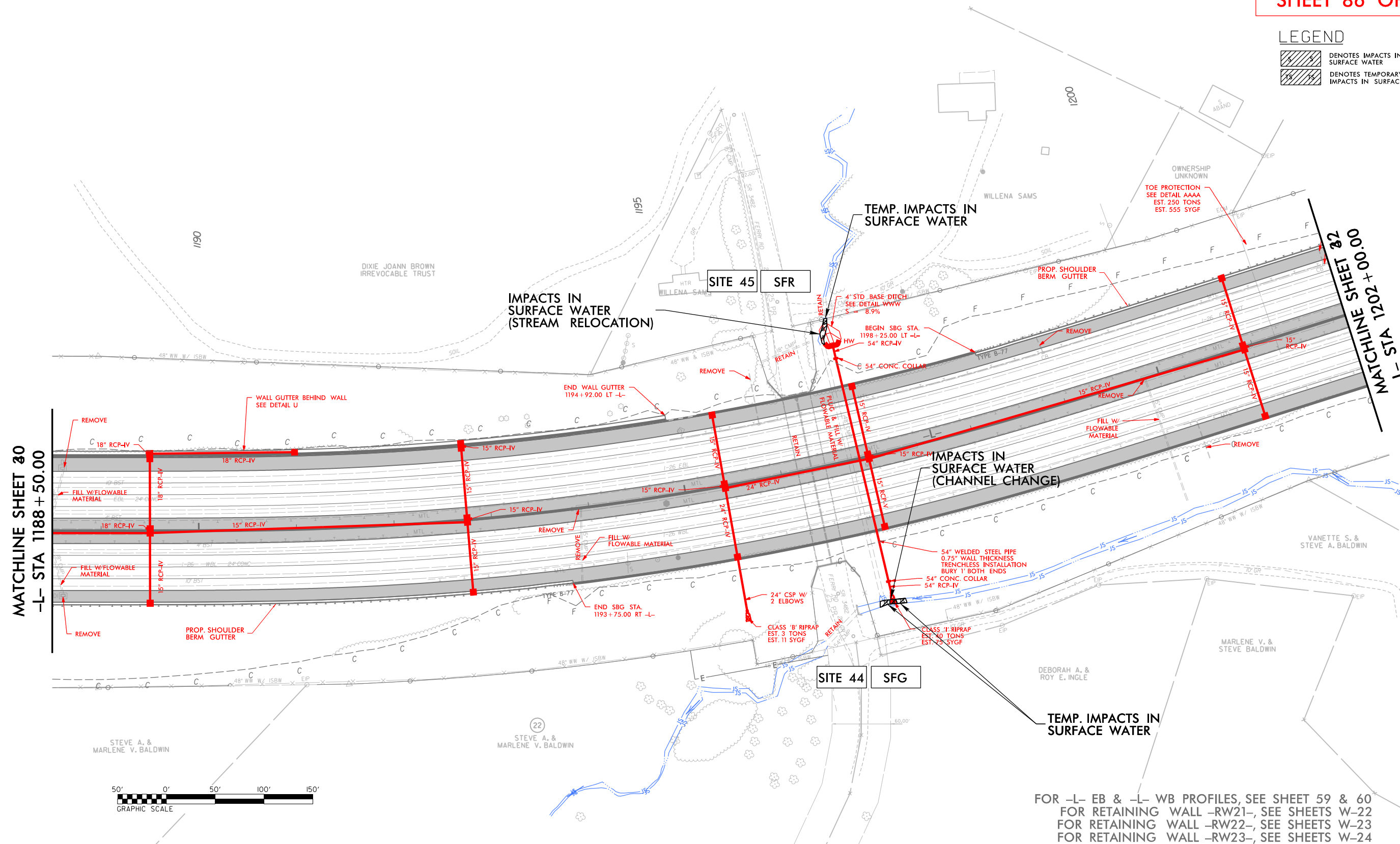
JAMES R. SCHRADER

# WETLAND & STREAM IMPACTS

**PERMIT DRAWING  
SHEET 86 OF 97**

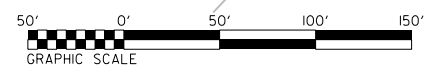
## LEGEND

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



MATCHLINE SHEET 30  
-L- STA 1188+50.00

MATCHLINE SHEET 32  
+L- STA 1202+00.00

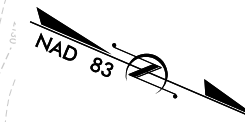


FOR -L- EB & -L- WB PROFILES, SEE SHEET 59 & 60  
 FOR RETAINING WALL -RW21-, SEE SHEETS W-22  
 FOR RETAINING WALL -RW22-, SEE SHEETS W-23  
 FOR RETAINING WALL -RW23-, SEE SHEETS W-24

11/14/2018 11:47:08 AM HYD\_PRM\_PSH\_31.dgn

7/19/2017

PROJECT REFERENCE NO. 1-4700	SHEET NO. 31
RW SHEET NO. 1-4700B-41	ROADWAY DESIGN ENGINEER
	HYDRAULICS ENGINEER



# WETLAND & STREAM IMPACTS

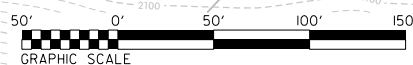
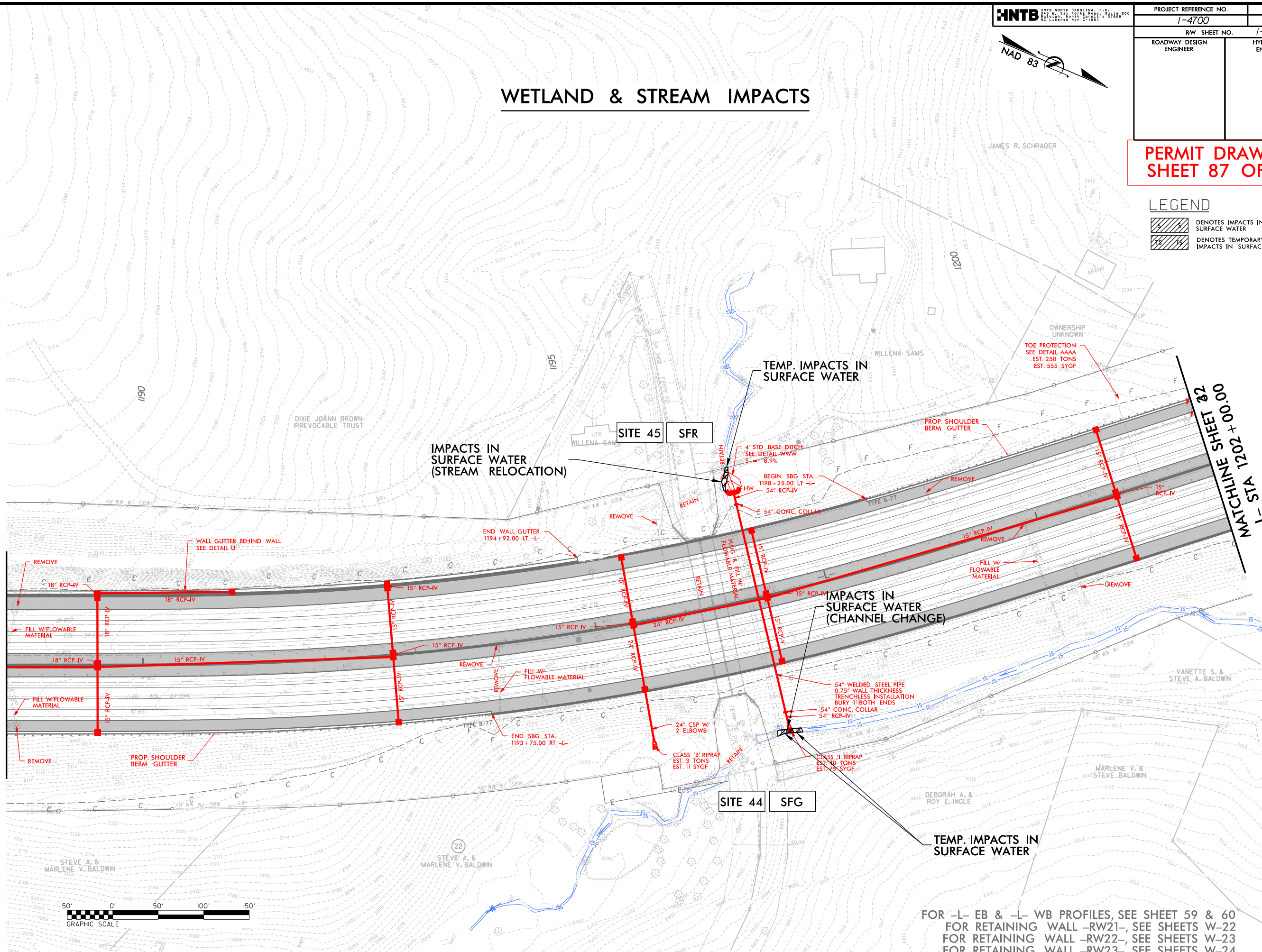
**PERMIT DRAWING  
SHEET 87 OF 97**

## LEGEND

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

**MATCHLINE SHEET 30  
-L- STA 1188 + 50.00**

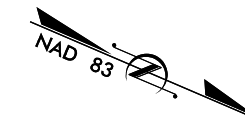
**MATCHLINE SHEET 32  
+00.00 TO STA 1202 + 00.00 -L-**



FOR -L- EB & -L- WB PROFILES, SEE SHEET 59 & 60  
 FOR RETAINING WALL -RW21-, SEE SHEETS W-22  
 FOR RETAINING WALL -RW22-, SEE SHEETS W-23  
 FOR RETAINING WALL -RW23-, SEE SHEETS W-24

11/14/2018  
1-4700B-HYD\_PRRM\_PSH\_31.dgn  
HNTB

PROJECT REFERENCE NO. 1-4700	SHEET NO. 31
RW SHEET NO. 1-4700B-41	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



**PERMIT DRAWING  
SHEET 88 OF 97**

**IMPACTS IN  
SURFACE WATER  
(STREAM  
RELOCATION)**

**TEMP. IMPACTS IN  
SURFACE WATER**

**LEGEND**



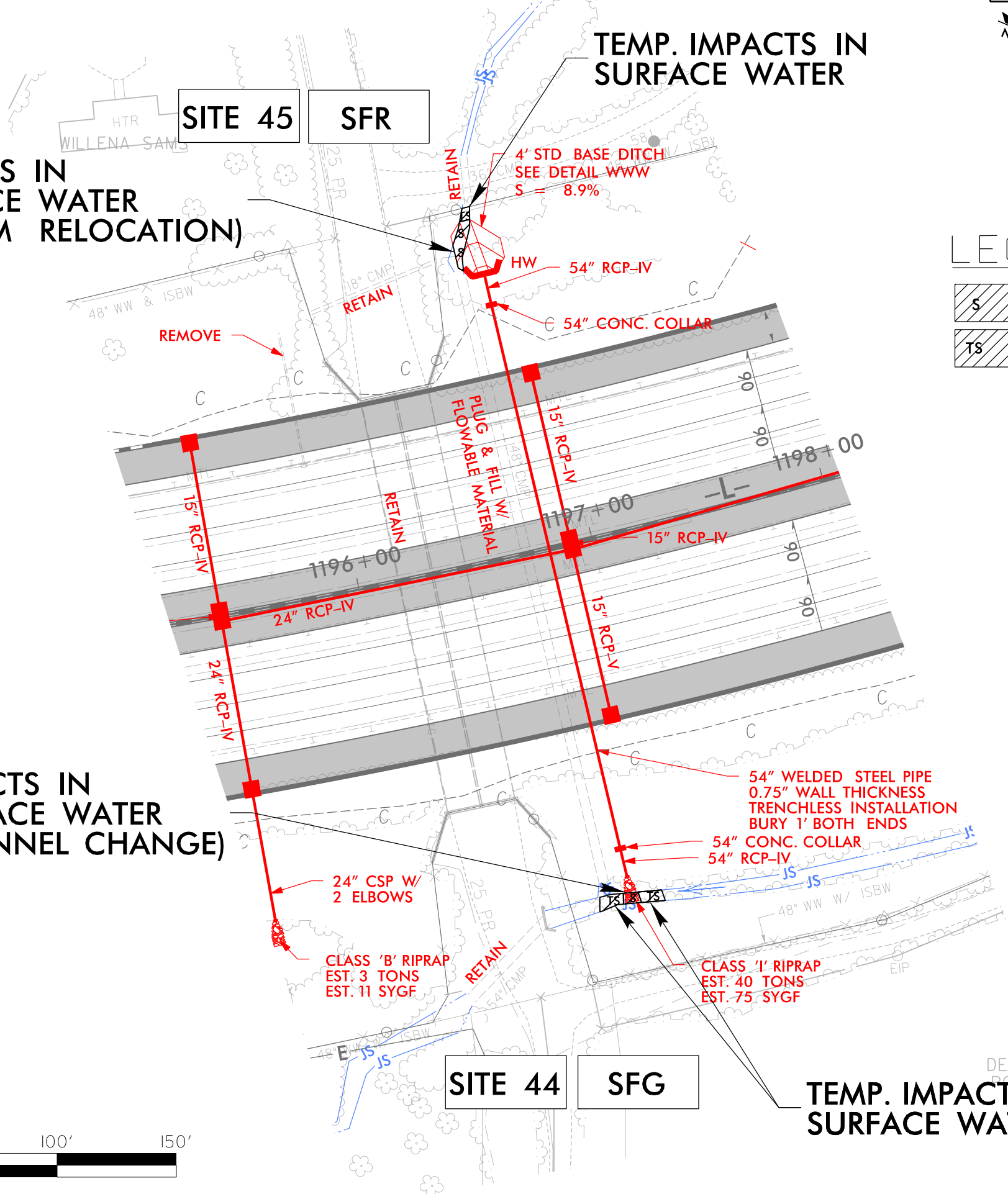
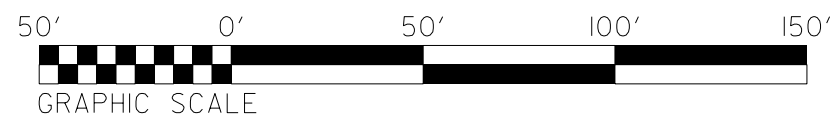
DENOTES IMPACTS IN  
SURFACE WATER



DENOTES TEMPORARY  
IMPACTS IN SURFACE WATER

**IMPACTS IN  
SURFACE WATER  
(CHANNEL CHANGE)**

**TEMP. IMPACTS IN  
SURFACE WATER**



**SITE 45**

**SFR**

**SITE 44**

**SFG**

DEBORAH



7/19/2017

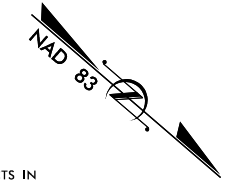
PROJECT REFERENCE NO.	SHEET NO.
1-4700	32
RW SHEET NO.	1-4700B-42
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 90 OF 97

# WETLAND & STREAM IMPACTS

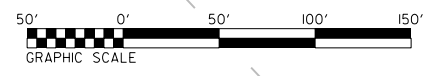
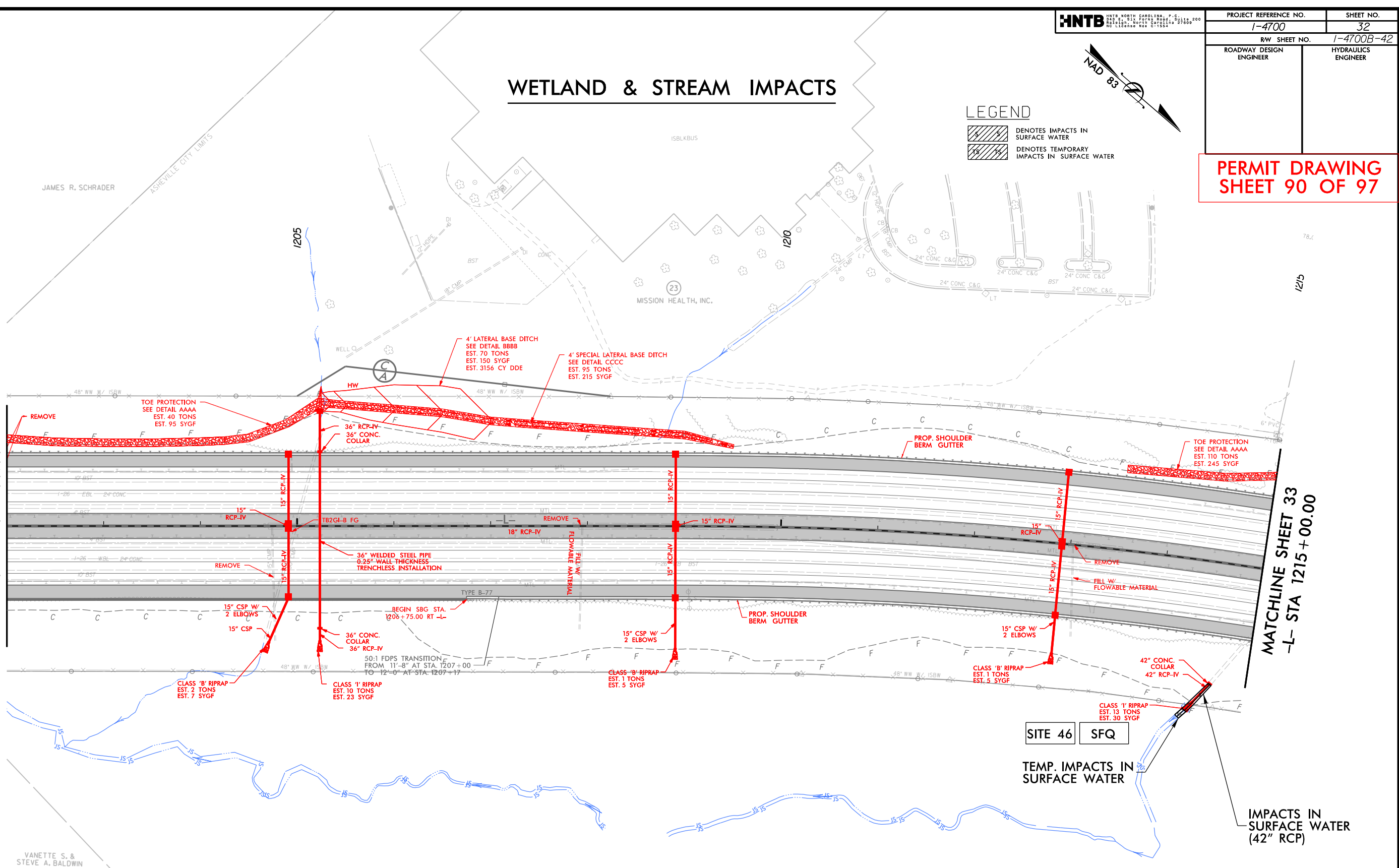
## LEGEND

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



MATCHLINE SHEET 31  
-L- STA 1202 + 00.00

MATCHLINE SHEET 33  
-L- STA 1215 + 00.00



FOR -L- EB & -L- WB PROFILES, SEE SHEET 60 & 61  
FOR RETAINING WALL -RW22-, SEE SHEETS W-23

11/14/2018 11:47:08 AM HYD\_PRM\_PSH\_32.dgn

7/19/2017

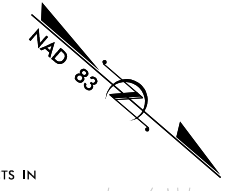


PROJECT REFERENCE NO.	SHEET NO.
1-4700	32
RW SHEET NO.	1-4700B-42
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

# WETLAND & STREAM IMPACTS

## LEGEND

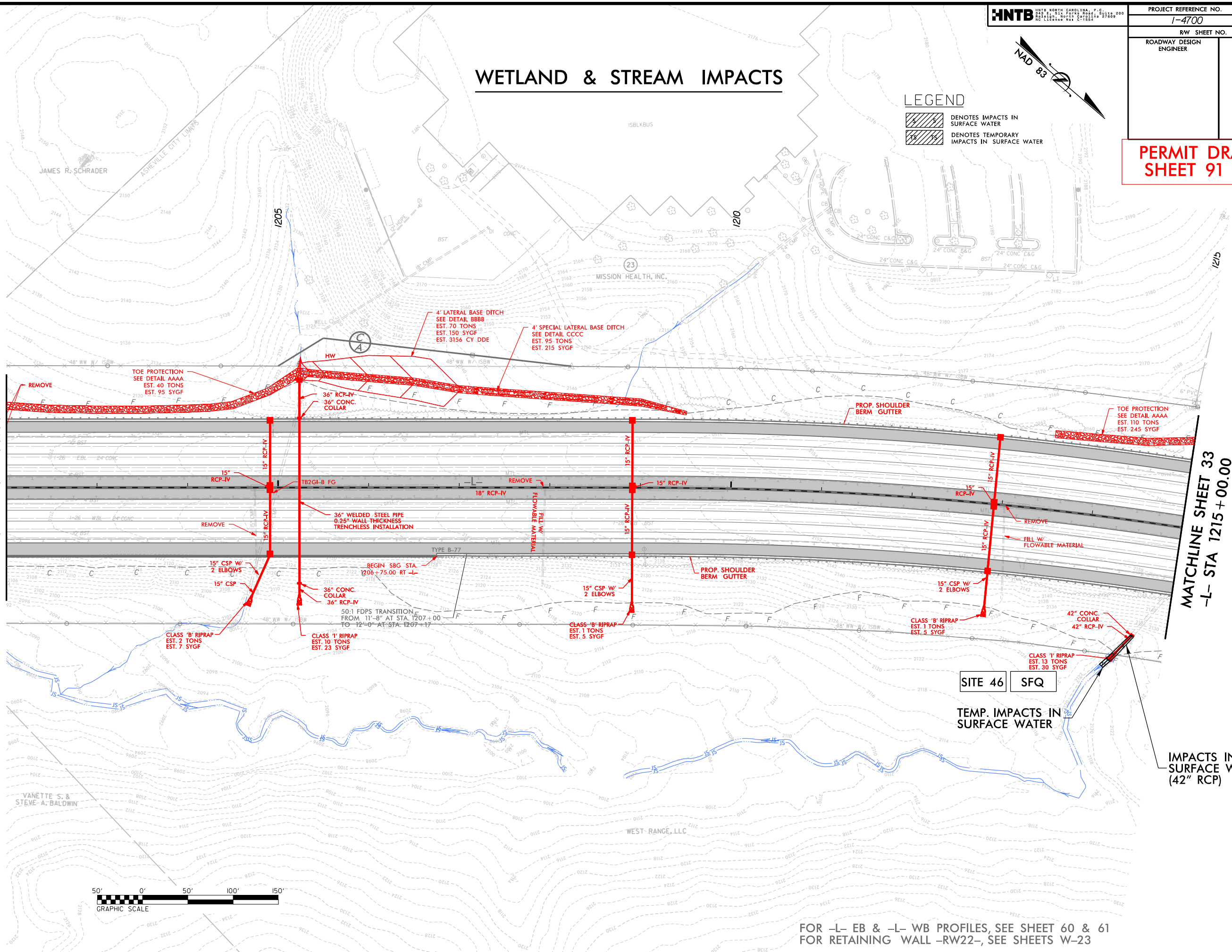
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER



**PERMIT DRAWING SHEET 91 OF 97**

MATCHLINE SHEET 31  
-L- STA 1202 + 00.00

MATCHLINE SHEET 33  
-L- STA 1215 + 00.00



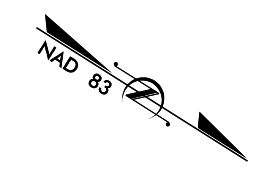
FOR -L- EB & -L- WB PROFILES, SEE SHEET 60 & 61  
FOR RETAINING WALL -RW22-, SEE SHEETS W-23

11/14/2018  
1-4700B-HYD\_PSH\_32.dgn  
HNTB

7/19/2017



PROJECT REFERENCE NO.	SHEET NO.
1-4700	33
RW SHEET NO.	1-4700B-43
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER



**PERMIT DRAWING  
SHEET 92 OF 97**

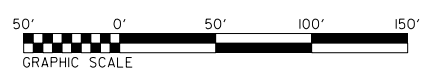
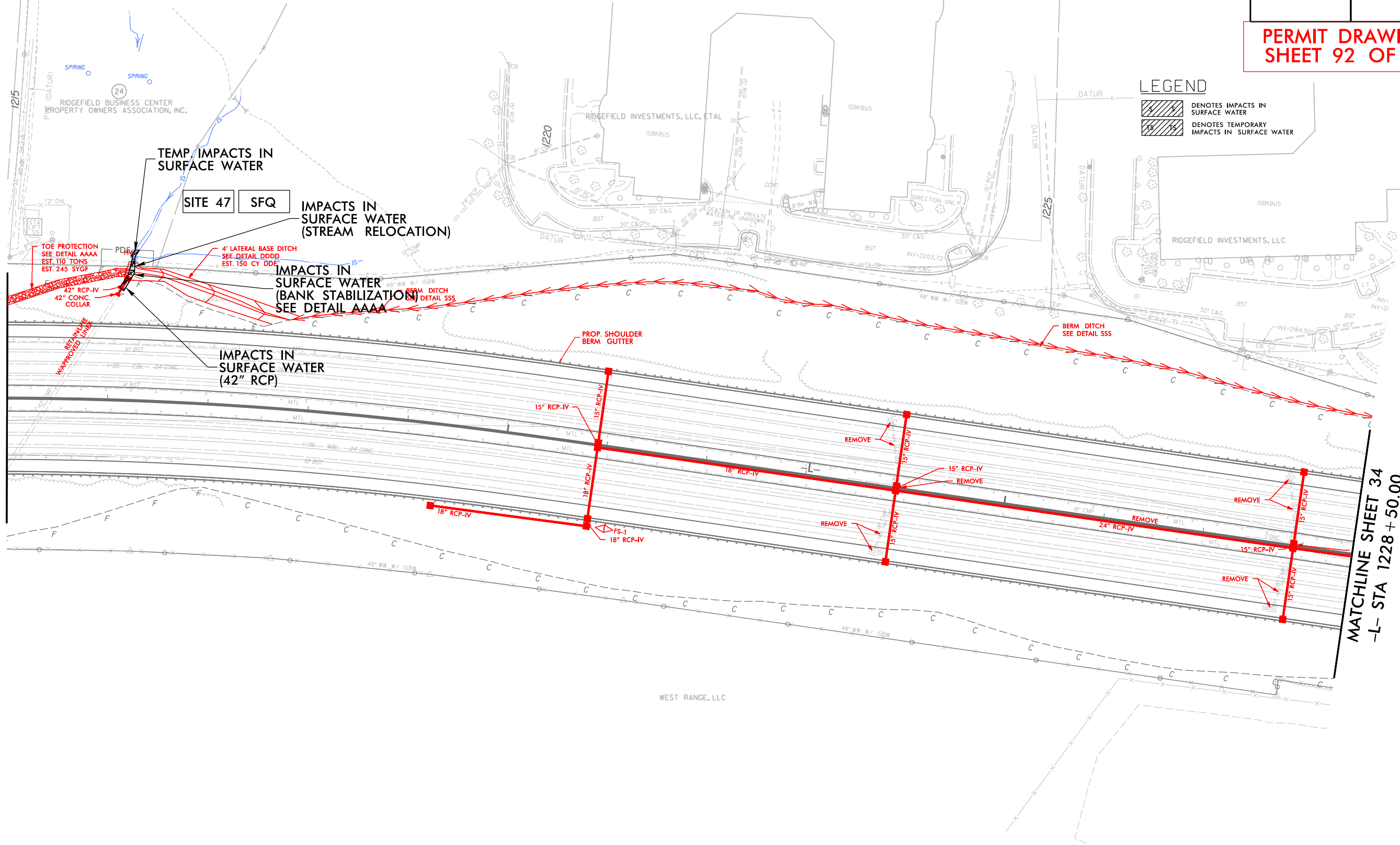
# WETLAND & STREAM IMPACTS

## LEGEND

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

MATCHLINE SHEET 32  
-L- STA 1215 + 00.00

MATCHLINE SHEET 34  
-L- STA 1228 + 50.00



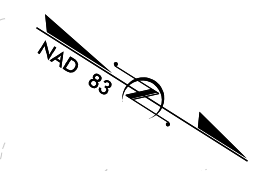
FOR -L- EB & -L- WB PROFILES, SEE SHEETS 61 & 62

11/14/2018  
11/14/2018\_HYD\_PRM\_PSH\_33.dgn  
HNTB

7/19/2017



PROJECT REFERENCE NO. 1-4700		SHEET NO. 33	
RW SHEET NO. 1-4700B-43		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	



# WETLAND & STREAM IMPACTS

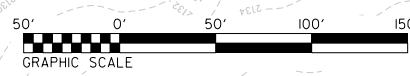
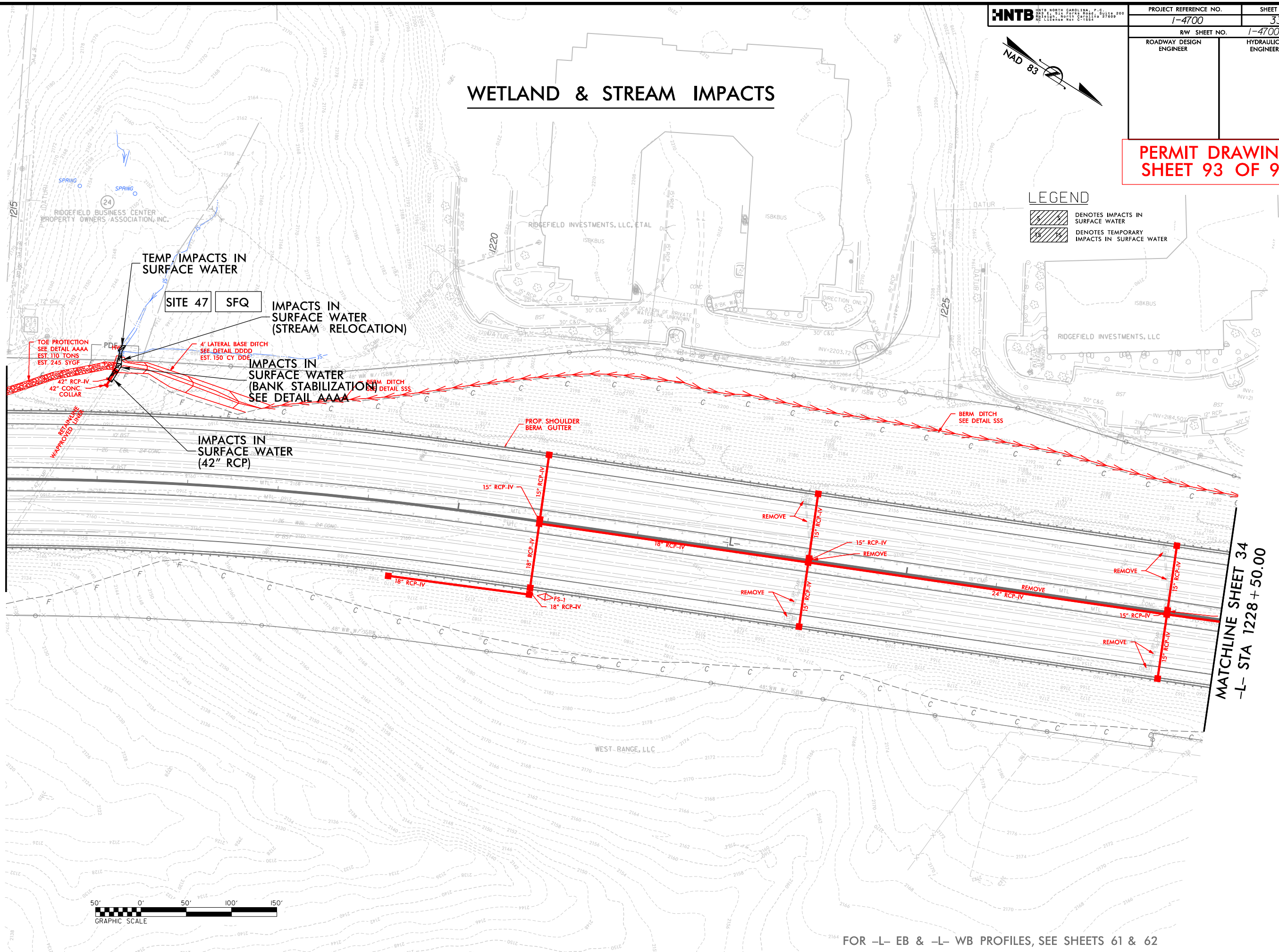
**PERMIT DRAWING  
SHEET 93 OF 97**

## LEGEND

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

MATCHLINE SHEET 32  
-L- STA 1215 + 00.00

MATCHLINE SHEET 34  
-L- STA 1228 + 50.00

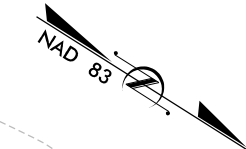


FOR -L- EB & -L- WB PROFILES, SEE SHEETS 61 & 62

11/14/2018  
14700B\_HYD\_PRM\_PSH\_33.dgn  
HNTB

PROJECT REFERENCE NO. 1-4700	SHEET NO. 33
RW SHEET NO. 1-4700B-43	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

**PERMIT DRAWING  
SHEET 94 OF 97**


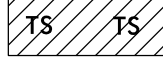


**TEMP. IMPACTS IN  
SURFACE WATER**

**SITE 47 SFQ**

**IMPACTS IN  
SURFACE WATER  
(STREAM RELOCATION)**

**LEGEND**

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

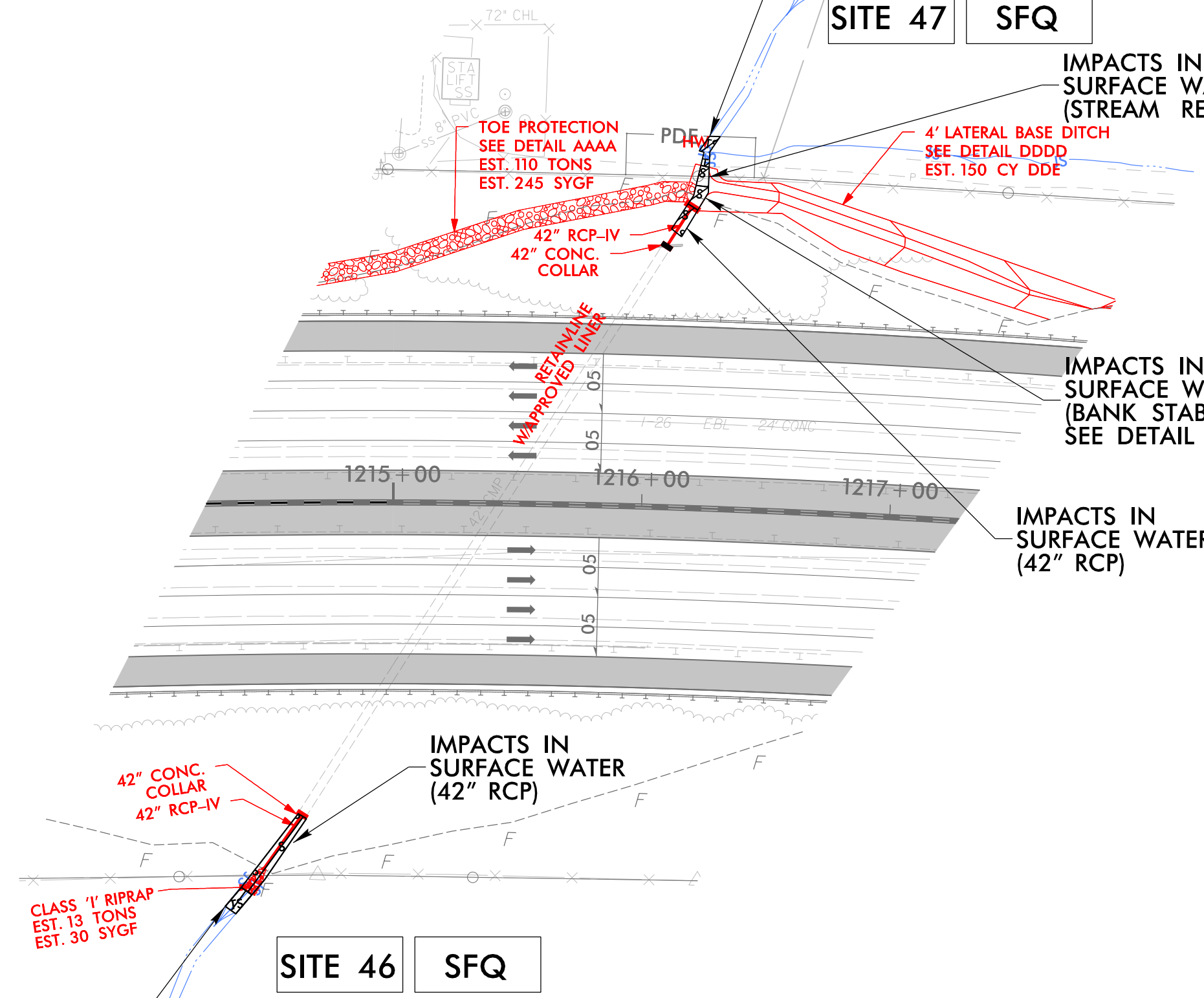
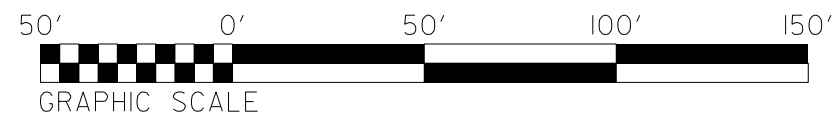
**IMPACTS IN  
SURFACE WATER  
(BANK STABILIZATION)  
SEE DETAIL AAAA**

**IMPACTS IN  
SURFACE WATER  
(42" RCP)**

**IMPACTS IN  
SURFACE WATER  
(42" RCP)**

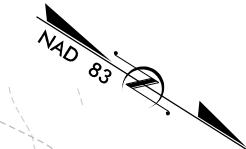
**TEMP. IMPACTS IN  
SURFACE WATER**

**SITE 46 SFQ**



PROJECT REFERENCE NO. 1-4700	SHEET NO. 33
RW SHEET NO. 1-4700B-43	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

**PERMIT DRAWING  
SHEET 95 OF 97**



**TEMP. IMPACTS IN  
SURFACE WATER**

**SITE 47 SFQ**

**IMPACTS IN  
SURFACE WATER  
(STREAM RELOCATION)**

**TOE PROTECTION  
SEE DETAIL AAAA  
EST. 110 TONS  
EST. 245 SYGF**

**4' LATERAL BASE DITCH  
SEE DETAIL DDDD  
EST. 150 CY DDE**

**42" RCP-IV  
42" CONC.  
COLLAR**

**LEGEND**



DENOTES IMPACTS IN SURFACE WATER



DENOTES TEMPORARY IMPACTS IN SURFACE WATER

**IMPACTS IN  
SURFACE WATER  
(BANK STABILIZATION)  
SEE DETAIL AAAA**

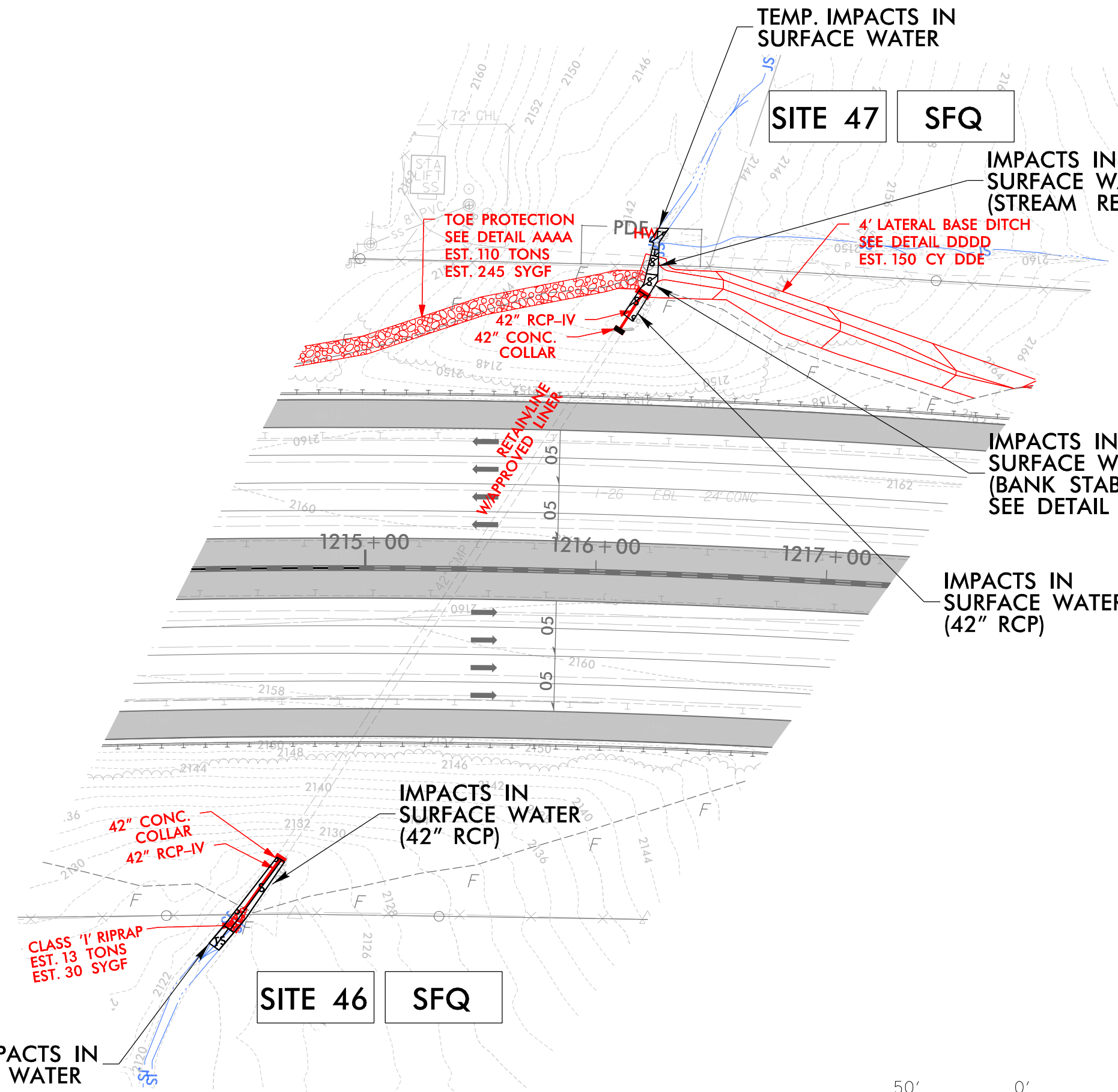
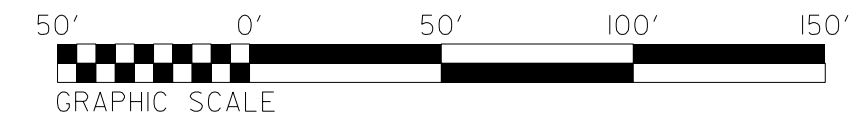
**IMPACTS IN  
SURFACE WATER  
(42" RCP)**

**IMPACTS IN  
SURFACE WATER  
(42" RCP)**

**CLASS 'I' RIPRAP  
EST. 13 TONS  
EST. 30 SYGF**

**SITE 46 SFQ**

**TEMP. IMPACTS IN  
SURFACE WATER**



**WETLAND AND SURFACE WATER IMPACTS SUMMARY**

Site No.	Stream Name Stream ID	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS					
				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	UT to French Broad River / SDI	Y13RPB 11+26 to 15+64 LT	Stream relocated to Proposed Roadside ditch Due to Roadway Widening									442		
1A	UT to French Broad River / SDD	WBL 881+50 to 886+10 RT	Stream relocated to Toe Protection due to Roadway Widening									452	10	
2	UT to French Broad River / SDC	WBL 887+41 to 887+62 RT	6' x 6' RCBC Culvert Extension Due to Roadway Widening									25		
2	UT to French Broad River / SDC	WBL 887+20 to 887+45 RT	Bank Stabilization at inlet of 6' X 6' RCBC									22	10	
3	UT to French Broad River / SDC	EBL 888+63 to 889+10 LT	Channel change at upstream and downstream of Existing Culvert									45		
3	UT to French Broad River / SDC	EBL 889+04 to 889+30 LT	Bank Stabilization at outlet of Existing Culvert									44	3	
4	UT to French Broad River / SDE	WBL 914+14 to 914+38 RT	66" RCP between Existing 66" RCP and 66" CMP in the WBL									55		
4	UT to French Broad River / SDE	WBL 913+64 to 913+93 RT	Bank Stabilization at inlet of 66" RCP									34	10	
5	UT to French Broad River / SDE	EBL 914+15 to 914+22 Median	66" RCP between Existing 66" CMP and 66" CMP in the Median									28		
6	UT to French Broad River / SDE	EBL 914+20 to 914+30 LT	Channel Change between outlet of Existing 66" CMP and proposed 66" WSP and Existing 48" CMP									29		
7	UT to French Broad River / SDF	WBL 932+16 to 932+22 RT	54" RCP Extension due to Roadway Widening									5		
8	UT to French Broad River / SDF	EBL 931+83 to 931+95 Median	54" CSP between two Existing 54" RCP in the Median									38		
9	UT to French Broad River / SDF	EBL 932+08 to 932+20 LT	54" RCP Extension Due to Roadway Widening and Conc. Energy Dissipator									30		
9	UT to French Broad River / SDF	EBL 932+14 to 932+23 LT	Channel Change at the outlet of Proposed 54" RCP Extension									9	14	
10	WBR	WBL 936+68 to 938+29 RT	Special Cut Ditches on both side of Inlet of Proposed 24" WSP and Existing 66" RCP	0.03		0.03								
11	UT to French Broad River / WBV	EBL 938+81 to 952+45 LT	RipRap Outlet Protection of Proposed 24" CSP and Existing 66" RCP	0.15		< 0.01								
12	UT to French Broad River / SFX / WBU	WBL 942+31 to 943+22 RT	30" RCP Extension Due to Roadway Widening			0.01						20	10	
13	UT to French Broad River / SDK / WBW	WBL 952+88 to 954+00 RT	66" RCP Extension Due to Roadway Widening / Fill and Excavation in wetland Due to Roadway Widening	0.07		0.02						40	10	
14	UT to French Broad River / SDK	EBL 952+66 to 952+77 LT	66" CSP Extension Due to Roadway Widening									14		
14	UT to French Broad River / SDK	EBL 952+72 to 952+80 LT	Channel Change at downstream of 66" CSP Extension									22	7	
15	Powell Creek / SDN	WBL 983+35 to 983+73 RT	Channel Change at inlet of Proposed 2@ 10' X 10' RCBC									40	10	
15	Powell Creek / SDN	WBL 983+67 to 983+80 RT	Existing 10' X10' RCBC Extension Due to Roadway Widening									12		
16	Powell Creek / SDN	EBL 984+63 to 984+90 LT	Existing 10' X10' RCBC Extension Due to Roadway Widening									16		
16	Powell Creek / SDN	EBL 984+69 to 985+01 LT	Channel Change at outlet of Proposed 2@ 10' X 10' RCBC									59	10	
17	UT to French Broad River / SDU	L 1027+43 to 1027+51 RT	Existing 48" RCP Extension Due to Roadway Widening									16		
17	UT to French Broad River / SDU	L 1027+47 to 1027+ 58 RT	Bank Stabilization									10	10	
18	UT to French Broad River / SDU	L 1026+47 to 1026+68 LT	Channel Change at outlet of Existing and Proposed 48" CMP and WSP									22	10	
18 A	French Broad River	L 1019+98 to 1020+50 LT	Channel Change at outlet of Existing 8' X 8' Conc. Box Culvert									10	10	
19	WCH	L 1031+14 to 1035+27 LT	Fill in Wetlands Due to Roadway Widening	< 0.01										
20	UT to French Broad River / SDV	L 1042+57 to 1042+72 RT	Stream relocation due to Existing 42" CMP Extension and Proposed 42" WSP									18	10	
20	UT to French Broad River / SDV	L 1042+69 to 1042+91 RT	Existing 42" CMP Extension Due to Roadway Widening and Proposed 42" WSP									33		
21	UT to French Broad River / SDW	L 1048+84 to 1049+00 RT	Existing 60" CMP Extension Due to Roadway Widening and Proposed 42" RCP									27		
21	UT to French Broad River / SDW	L 1048+93 to 1049+20 RT	Channel Change at inlet of Proposed 60" CMP Extension and Proposed 42" RCP									24	12	
22	WCH	L 1047+74 to 1047+84	Excavation in Wetland Due to Roadway Widening			< 0.01								
<b>TOTALS*:</b>				<b>0.25</b>		<b>0.07</b>						<b>1639</b>	<b>145</b>	

\*Rounded totals are sum of actual impacts

NOTES:

NC DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
11/14/2018  
Buncombe & Henderson County  
I-4700

**WETLAND AND SURFACE WATER IMPACTS SUMMARY**

Site No.	Stream Name Stream ID	Station (From/To)	Structure Size / Type	WETLAND IMPACTS					SURFACE WATER IMPACTS					
				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	UT to French Broad River / SDX	WBL 1082+23 to 1085+46 RT	Stream relocated to Proposed Lateral 'V' ditch due to Roadway Widening									312	10	
23	UT to French Broad River / SDX	WBL 1090+35 to 1090+65 RT	Channel change at the Outlet of Proposed 30" CSP and Conc. Energy Dissipator									9	20	
23	UT to French Broad River / SDX	WBL 1091+34 to 1092+04 RT	Proposed 48" WSP with 48" RCP Extension									62	10	
24	UT to French Broad River / SDX	WBL 1094+12 to 1094+42 median	Channel Change at Outlet of Proposed 48" RCP									24	10	
24A	UT to French Broad River / SDX	EBL 1097+18 to 1097+46 median	Channel Change at Outlet of Proposed 30" WSP with 30" RCP Extension									7	20	
25	UT to French Broad River / SEU	EBL 1097+19 to 1097+34 LT	Proposed 30" WSP with 30" RCP Extension									15	4	
26	UT to French Broad River / SDX	EBL 1105+42 to 1105+52 RT	Stream relocated to Proposed Standard Base Ditch									32	5	
27	UT to French Broad River / SDY / WCV	WBL 1104+37 to 1104+51 RT	Bank Stabilization at end of Toe Protection			< 0.01						7	10	
28	UT to French Broad River / SDY	WBL 1104+88 to 1105+14 LT	Channel Change at Outlet of Proposed 24" CSP and Conc. Energy Dissipator									9	18	
29	UT to French Broad River / SDX	EBL 1106+74 to 1107+07 RT	Temp. Impact for Constructing Standard Base Ditch										30	
29	UT to French Broad River / SDX	WBL 1107+12 to 1107+38 LT	Channel Change at Outlet of Proposed 24" WSP with 24" CSP Extension									7	20	
30	UT to French Broad River / SDX	WBL 1115+40 to 1115+70 LT	Channel Change at Outlet of 24" CSP and Conc. Energy Dissipator									9	20	
30	UT to French Broad River / SDX	EBL 1117+98 to 1118+02 RT	Temp. Impact for Constructing Standard 'V' Ditch										4	
30	UT to French Broad River / SDX	WBL 1118+34 to 1118+65 LT	Channel Change at Outlet of 15" CSP and Conc. Energy Dissipator									9	18	
30	UT to French Broad River / SDX	WBL 1118+62 to 1119+51 LT	Proposed 66" WSP with 66" RCP Extension									77	10	
31	UT to French Broad River / SDX	WBL 1120+78 to 1121+11 RT	Proposed 66" WSP with 66" RCP Extension									38	10	
32	WCW	WBL 1123+76 to L 1137+72 RT	Fill in Wetland Due to Roadway Widening	0.37										
32	UT to French Broad River / SEQ	WBL 1131+60 to 1131+94 RT	Stream relocated to Proposed 60" WSP with 60" RCP Extension									57	7	
33	UT to French Broad River / SEQ	EBL 1131+02 to 1131+11 LT	Stream relocated to Proposed 60" WSP with 60" RCP Extension									24	10	
34	UT to French Broad River / SED	L 1138+18 to 1138+32 LT	Stream relocated to Standard Base Ditch at the Outlet of Proposed 36" RCP									31	12	
34	UT to French Broad River / SED	L 1138+29 to 1138+47 LT	Existing 36" CMP Extension with a 36" RCP Due to Roadway Widening									25		
35	WCZ	L 1138+55 to 1139+39 RT	Fill in Wetland Due to Roadway Widening	0.02										
36	UT to French Broad River / SEF	L 1147+02 to 1147+09 LT	Channel Change at Outlet of Proposed 42" RCP									8	10	
36	UT to French Broad River / SEF	L 1146+98 to 1147+07 LT	Existing 42" CMP Extension with a 42" RCP Due to Roadway Widening									28		
37	UT to French Broad River / SEF	L 1148+35 to 1148+64 RT	Channel Change at the Outlet of Proposed 15" CSP and Conc. Energy Dissipator									9	20	
37	UT to French Broad River / SEF	L 1149+17 to 1151+55 RT	Stream relocated to Proposed 4' Lateral Base Ditch due to Roadway Widening									228	10	
38	UT to French Broad River / SEE	L 1153+90 to 1154+10 RT	Stream relocated to Proposed 4' Lateral Base Ditch due to Roadway Widening									18	10	
38	UT to French Broad River / SEE	L 1155+35 to 1155+64 RT	Bank Stabilization at outlet of Proposed 15" CSP and Conc. Energy Dissipator									9	20	
38	UT to French Broad River / SEE	L 1156+95 to 1158+01 RT	Temp. Pipe for Access Road										106	
38	UT to French Broad River / SEE	L 1157+29 to 1157+38 RT	Channel Change at Outlet of Proposed 30" CSP and Conc. Energy Dissipator									9		
39	WFG	L 1153+55 to 1153+89 LT	Fill in Wetland Due to Roadway Widening	< 0.01		< 0.01								
39	UT to French Broad River / SEE	L 1153+56 to 1153+67 LT	Proposed 24" RCP									33		
39	UT to French Broad River / SEE	L 1153+63 to 1153+77 LT	Stream relocated to Retaining Wall Gutter									22	10	
40	French Broad River	L 1161+33 to 1165+06	Bridge									245		
41	UT to French Broad River / SFG	L 1164+95 to 1171+67 RT	Temporary Pipe Due to Access Road										662	
41	UT to French Broad River / SFG	L 1172+85 to 1173+15 RT	Channel Change at Outlet of Proposed 15" CSP and Conc. Energy Dissipator									9	20	
42	UT to French Broad River / SFO	L 1169+93 to 1170+02 LT	Temporary Pipe Due to Access Road										9	
43	WDZ	L 1179+54 to 1180+29 RT	Fill in Wetland Due to Roadway Widening	0.02										
44	UT to French Broad River / SFG	L 1196+69 to 1196+95 RT	Channel Change at Outlet of Proposed 54" WSP with 54" RCP Extension									8	20	
45	UT to French Broad River / SFR	L 1196+70 to 1196+81 LT	Stream relocated to Proposed 4' Standard Base Ditch at Outlet of Proposed 54" WSP with 54" RCP Extension									21	6	
46	UT to French Broad River / SFQ	L 1214+30 to 1214+64 RT	Existing 42" CMP Extension with a 42" RCP Due to Roadway Widening									38	10	
47	UT to French Broad River / SFQ	L 1216+09 to 1216+19 LT	Existing 42" CMP Extension with a 42" RCP Due to Roadway Widening									12		
47	UT to French Broad River / SFQ	L 1216+15 to 1216+22 LT	Bank Stabilization at end of Toe Protection									9		
47	UT to French Broad River / SFQ	L 1216+18 to 1216+26 LT	Stream relocated to Proposed 4' Lateral Base Ditch due to Roadway Widening									8	13	
TOTALS*:				0.41		< 0.01						1467	1173	
TOTALS FOR I-4700:				0.66		0.07						3106	1318	

\*Rounded totals are sum of actual impacts

NOTES:

Site 40: Impacts of interior bents are 400 SF

NC DEPARTMENT OF TRANSPORTATION  
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11/14/2018  
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I-4700