STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

December 3, 2018

U. S. Army Corps of Engineers
Regulatory Field Office
151 Patton Avenue, Room 208
Asheville, NC 28805

ATTN: Ms. Loretta Beckwith
NCDOT Coordinator

Subject: **Application for an Individual Section 404, Section 10, and Section 401 Water Quality Certification** for the proposed I-26 Widening from NC 225 (US 25 Connector) in Henderson County to I-40 in Buncombe County, Federal Aid Nos. NHF-26-1(62)23 / I(MNHF-026-1(86)9, TIP Project Nos. I-4400 / I-4700; Divisions 14 / 13.
Debit $570 from WBS No. 36030.1.2

Dear Ms. Beckwith:

The North Carolina Department of Transportation (NCDOT) proposes to improve a 22.2-mile section of Interstate 26 (I-26) in Henderson and Buncombe Counties, beginning just south of Hendersonville in Henderson County, and ending just south of Asheville, in Buncombe County. The project is included in the 2016-2025 State Transportation Improvement Program (STIP) as two projects: STIP Projects I-4400 and I-4700. STIP I-4400 begins at the US 25 Connector (Exit 54) south of Henderson and extends along I-26 to NC 280 (Airport Road - Exit 40), a distance of 13.6 miles. STIP Project I-4700 extends north along I-26 from NC 280 (Airport Road - Exit 40) to the I-40 interchange, a distance of 8.6 miles. The replacement of the existing Blue Ridge Parkway bridge over I-26, will be completed in conjunction with STIP I-4700. Additionally, the rest areas along I-26, south of Fanning Bridge Road (SR 3539) overpass in Henderson County, will also be reconstructed as part of STIP I-4400. This project is also included in the French Broad River Metropolitan Planning Organization's (FBRMPO) 2040 Long Range Transportation Plan (LRTP).

Please see the enclosed ENG 4345; North Carolina Division of Mitigation Services (NCDMS) Acceptance Letter (for all funded sections – excludes I-4400A); Meeting Minutes – Concurrence Points 4B and 4C; State Stormwater Management Plan (SMP); permit drawings; and design plans for all sections of the project in Final Design stage (I-4700A and I-4700B). Additionally, preliminary mapping, that also includes preliminary impacts (slope stake +25'), are included for sections in preliminary design.

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Purpose and Need:

The purpose of the proposed project is to reduce congestion, with a goal of achieving an overall Level of Service (LOS) D in the design year (2040) and improve the pavement structure. The need of the project is to improve existing and projected roadway capacity deficiencies and improve insufficient pavement structure and deteriorating existing road surface conditions.

Summary of Jurisdictional Impacts:

The number of jurisdictional resources impacted by the project, broken down by section, is presented in Table 1.

Table 1. Summary of Water Resources Impacted per Section

Section	Design Stage	Proposed LET	Total # Wetlands Impacted	Total # Streams Impacted	Total # Ponds Impacted
I-4400A	Preliminary*	post year	13	23	1
I-4400BA	Preliminary*	10/18/2022	0	1	0
I-4400BB	Preliminary*	6/18/2019	4	20	0
I-4400C	Preliminary*	6/18/2019	6	18	0
I-4700A	Final	5/21/2019	4	8	**0**
I-4700B	Final	5/21/2019	6	15	**0**
Project Totals:			**33**	**85**	**1**

*Preliminary totals were determined by measuring 25' outside of preliminary slope stake lines.

The total and projected wetland and stream impacts, broken down by section, are presented in Table 2 and Table 3, respectively.

Table 2. Summary of Wetland Impacts per Section

Section	Design Stage	Wetland Impact area (ac)	Impacts requiring Mitigation (ac)
I-4400A	Preliminary*	0.54	N/A**
I-4400BA	Preliminary*	0	0
I-4400BB	Preliminary*	0.04	0.04
I-4400C	Preliminary*	0.77	0.77
Preliminary Design totals:		**1.35**	**1.35**
I-4700A	Final	0.74	0.74
I-4700B	Final	0.82	0.82
Final Design totals:		**1.56**	**1.56**
Project Totals:		**2.91**	**2.37**

*Preliminary Impacts were determined by measuring 25' outside of preliminary slope stake lines, and are presented as Permanent impacts requiring mitigation

**Mitigation for the non-funded (post year) section is not required at this time and will be requested when funding is secured.

Table 3. Summary of Stream Impacts per Section

Section	Design Stage	Permanent Stream Impact (lf)	Temporary Stream Impact (lf)	Impacts Requiring Mitigation (lf)
I-4400A	Preliminary*	5,068	X	N/A**
I-4400BA	Preliminary*	185	X	185
I-4400BB	Preliminary*	2,354	X	2,354
I-4400C	Preliminary*	4,268	X	4,268
Preliminary Design Totals:		**11,875**	**X**	**6,807**
I-4700A	Final	1,404	121	1,168 ***
I-4700B	Final	1,552	1,480	1,506 ***
Final Design totals:		**2,956**	**1,601**	**2,674**
Project Totals:		**14,831**	**1,601**	**9,481**

*Preliminary Impacts were determined by measuring 25' outside of preliminary slope stake lines and are presented as Permanent impacts requiring mitigation.

**Mitigation for the non-funded (post year) section is not required at this time and will be requested when funding is secured.

***Bank stabilization impacts have been deducted from the permanent stream impacts for sections in Final Design for determination of mitigation requirements.

Summary of Utility Impacts:
There will be no impacts associated with utility relocations.

Summary of Mitigation:
The project has been designed to avoid and minimize impacts to jurisdictional areas throughout the National Environmental Policy Act (NEPA) and design processes. However, project impacts will necessitate compensatory mitigation for the unavoidable impacts.

Of the 14,831 linear feet of permanent stream impacts for the entire project:

- 282 lf are for bank stabilization (on the final design sections of I-4700A & I-4700B), which does not require mitigation,
- 5,068 lf of stream impacts are associated with Section I-4400A, which is post-year, thus mitigation is not required at this time,
- Resulting in 9,481 linear feet of permanent stream impacts requiring mitigation (see Table 3) for this permit application.

Of the 2.91 acres of permanent wetland impacts for the entire project:

- 0.54 acres of permanent wetland impacts are associated with Section I-4400A, which is post-year, thus mitigation is not required at this time,
- Resulting in 2.37 acres of permanent wetland impact requiring mitigation (see Table 2).

NCDOT has acquired compensatory mitigation for these unavoidable impacts from the Division of Mitigation Services (DMS).

NEPA DOCUMENT STATUS

An Environmental Analysis (EA) was completed for STIP I-4400 (the 13.6-mile segment from US 25 Connector to NC 280) in May 2001. Following completion of the Finding of No Significant Impact (FONSI) decision document in January 2002, the project was advertised as a Design-Build project by NCDOT. A lawsuit and resulting judgment in 2003 found that NCDOT should conduct a broader analysis of the cumulative impacts and logical termini, or project limits, of the overall expansion of the I-26 corridor.

The project was subsequently placed on hold due to the financial constraints of the larger project. However, the growing need for improvements to the I-26 corridor was recognized and the project was reinitiated and included in the Draft NCDOT 2013-2023 STIP. To address the 2003 judgment, the NCDOT combined the analysis of STIP I-4400 and STIP I-4700 into one comprehensive Environmental Impact Statement (EIS).

A *Draft EIS* (DEIS) was signed on August 9, 2016. A *Reevaluation of the Draft EIS* was also prepared by the NCDOT in coordination with FHWA and signature is pending. A combined *Final EIS (FEIS) / Record of Decision (ROD)* is pending.

Copies of these documents can be found on the NCDOT Website:
https://xfer.services.ncdot.gov/pdea/PermApps/I-4400%20and%20I-4700/.

PROJECT SCHEDULE

The project will be permitted in phases due to project size, funding, and STIP schedule. Table 4 describes the proposed project sections and phasing. The impacts reported in this Individual Permit Application for I-4700A and I-4700B are based on final design. The proposed impacts for the remaining project sections are based on preliminary design slope stakes plus 25 feet for jurisdictional resources. Permit modification requests will be submitted as the final design is completed for each of the remaining sections according to the phasing dates provided in Table 4.

Table 4. Project Phasing for I-26 (I-4400 / I-4700)

Section	Approximate Section Limits	Approx. Length*	Construction Letting
I-4400A	From US 25 (Exit 54) to US 64 (Exit 49)	4.1	post year
I-4400BA	US 64 Interchange (Exit 49)	n/a	October 18, 2022
I-4400BB	From US 64 (Exit 49) to US 25 Business (Exit 44)	4.9	June 18, 2019
I-4400C	From US 25 Business (Exit 44) to NC 280 (Exit 40)	3.5	June 18, 2019
I-4700A	From NC 280 (Exit 40) to NC 146-Long Shoals Rd. (Exit 37)	3.3	May 21, 2019
I-4700B	From NC 146-Long Shoals Rd. (Exit 37) to I-40.	5.3	May 21, 2019

*based on rounding to nearest 0.1 mile. Total project length is 22.2 miles.

The project has a Let date of May 21, 2019, for Sections I-4700A & B. NCDOT will need permits by April 1, 2019, in order to start the contract for this project.

INDEPENDENT UTILITY

The subject project is in compliance with 23 CFR Part 771.111(f) which lists the Federal Highway Administration (FHWA) characteristics of independent utility of a project:

(1) The project connects logical termini and is of sufficient length to address environmental matters on a broad scope,
(2) The project is usable and a reasonable expenditure, even if no additional transportation improvements are made in the area;
(3) The project does not restrict consideration of alternatives for other reasonably foreseeable transportation improvements.

Please see the *FEIS / ROD*, Section 1.5 Project Termini (page 1-3) for additional information.

RESOURCE STATUS

Waters within the project area are located in the Broad River Basin (HUC 03050105) and the French Broad River Basin (HUC 06010105). There are no Outstanding Resource Waters (ORW), High Quality Waters (HQW), Water Supply Waters (WS-I or WS-II) waters within 1.0 mile of the project area.

A Preliminary Jurisdictional Determination (PJD) was obtained on July 22, 2014, for the entire I-4400 / I-4700 project. Lori Beckwith with the US Army Corps of Engineers (USACE) and Kevin Barnett with the NC Division of Water Resources (NCDWR) attended the field visits on May 7 & 8, 2014.

303(d) Impaired Waters:

Of the named streams and/or their tributaries located within or near this project, five are listed on the Final 2016 303(d) list: Cane Creek, Clear Creek, Devils Fork, French Broad River, and Mud Creek. However, the sections of Cane Creek, Clear Creek, and the French Broad River that are impacted by the project are not included on the List. The two streams that are impacted by the project (Mud Creek and Devils Fork) are listed for benthos and fish community; however, they are not listed for turbidity or sedimentation.

IMPACTS TO WATERS OF THE U.S.

Tables 5 and 6 summarize the impacts to jurisdictional wetlands and streams, respectively. Site numbers correspond with the permit (hydraulic) drawings included in this application and with the PJD package, dated December 2013, and with the updated PJD tables, dated June 19, 2014. NCDOT received the PJD authorization from the USACE, dated July 22, 2014.

All stream impacts for the sections in Final Design (I-4700) are within French Broad River Basin. Stream classifications and statuses are listed in Table 6. Sites 1-16 are within I-4700A, and Sites 17-47 are within I-4700B.

Table 5 – I-4700A & I-4700B Wetland Impacts* (NOTE: Sites 1-9 are stream impact sites only)

Permit Site / Wetland ID[1/]	NC WAM Classification	Wetland Size (ac)	Perm. Fill in Wetlands (ac)	Excavation (ac)	Mechanized Clearing (ac)	Impact Description
10 / WBR	Headwater Forest	0.70	0.03	0.03	0.03	Filling of a portion of wetland from widening of the road and excavation of a special cut ditch on both sides of inlet or proposed 24" WSP and existing (retained) 66" RCP.
11 / WBV	Bottomland Hardwood Forest	9.38	0.15	<0.01	0.37	Excavation of a small portion of wetland for proposed riprap pad at proposed 24" WSP outlet and existing (retained) 66" RCP outlet to dissipate flow. Filling of a portion of wetland due to road widening, and for a riprap pad at proposed 18" RCP outlet for flow dissipation.
12 / WBU	Headwater Forest	0.08	0	0.01	0.02	Excavation in wetland for special cut ditch and lateral base ditch tying in to Stream SFX, for flow into existing (retained) 30" RCP.
13 / WBW	Non-Tidal Freshwater marsh	0.09	0.07	0.02	<0.01	Filling in wetland for roadway widening. Excavation in wetland for proposed lateral "V" ditch, which ties to Stream SDK.
19 / WCH	Bottomland Hardwood Forest	8.15	<0.01	0	0.06	Filling of a small portion of wetland along toe of slope due to roadway widening.
22 / WCH	Bottomland Hardwood Forest	8.15	0	<0.01	0.01	Excavation of small portion of wetland for placement of riprap pad at outlets of existing (retained) 66" CMP and proposed 42" WSP for energy dissipation.
27 / WCV	Headwater Forest	0.01	0	<0.01	0	Excavation of wetland for tying in the end of riprap toe protection.
32 / WCW	Bottomland Hardwood Forest	4.99	0.37	0	0.30	Filling of a portion of wetland along toe of slope due to roadway widening and from proposed 60" RCP.
35 / WCZ	Headwater Forest	0.02	0.02	0	0	Filling of entire wetland along toe of slope from roadway widening and from riprap pad at existing (retained) 36" CMP for energy dissipation.
39 / WFG	Headwater Forest	<0.01	<0.01	0	0	Filling of entire small wetland on toe of slope due to roadway widening.
43 / WDZ	Bottomland Hardwood Forest	0.09	0.02	0	0.02	Filling of portion of small wetland along toe of slope due to roadway widening.
Totals by Impact Type:			**0.67**	**0.07**	**0.82**	
Total Permanent Wetland Impacts:			**1.56**			

* Wetlands impacted are riparian.

1/ Wetland IDs correspond to I-4400/4700 PJD labeling.

2/ Rounded Totals are sum of actual impacts to 1/1000th.

Table 6 – I-4700A & I-4700B Stream Impacts

Permit Site	Stream Name/ NRTR ID[1]	Stream Status[2]/ Class	Permanent Channel Impacts	Bank Stabilization	Temp. Channel Impacts	ACOE Required Mitigation[3]	DWR Required Mitigation[3]	Permanent Impacts Description
1	UT to French Broad River/SDI	I / B	342	X	X	1:1	N	Stream relocation – due to roadway widening, stream relocated to proposed roadside ditch, which will be armored with riprap.
1A	UT to French Broad River/SDD	I / B	186	X	X	1:1	N	Stream relocation - due to roadway widening, Intermittent stream relocated to toe of slope and armored with riprap before tying back into perennial reach.
		P / B	266	X	10	1:1	Y	Stream relocation - stream relocated to toe of slope and armored with riprap due to roadway widening.
2	UT to French Broad River/SDC	P / B	25	X	X	2:1	N	Culvert Extension - 6' x 6' RCBC inlet extension.
			X	22	10	N	N	Bank stabilization at RCBC inlet extension.
3	UT to French Broad River/SDC	P / B	45	X	X	2:1	N	*Channel change – riprap armoring at inlet (where lateral base ditch and proposed 15" RCP tie in) and outlet of existing (retained) culvert.
			X	44	3	N	N	Bank stabilization beyond outlet protection.
4	UT to French Broad River/SDE	P / B	55	X	X	2:1	N	Pipe Extension - Extension of existing (retained) 66" CMP with a 66" RCP that connects to the outlet of existing pipe (retained) that crosses Glenn Bridge Road.
			X	34	10	N		Bank stabilization at inlet of existing (retained) pipe crossing Glenn Bridge Rd. (adjacent to proposed 66" high-flow RCP).
5	UT to French Broad River/SDE	P / B	28	X	X	2:1	N	Pipe extension – open channel in existing median closed by 66" RCP connecting existing (retained) 66" CMP with existing (retained) 66" CMP in median.
6	UT to French Broad River/SDE	P / B	29	X	X	1:1	N	*Channel change - Stream outlet protection of existing [retained] pipe where proposed adjacent 66" high flow pipe outlet connects.
7	UT to French Broad River/SDF	P / B	X	X	27	2:1	N	Pipe Extension - extension of existing (retained) 54" RCP.

Permit Site	Stream Name/ NRTR ID[1]	Stream Status[2]/ Class	Permanent Channel Impacts	Bank Stabilization	Temp. Channel Impacts	ACOE Required Mitigation[3]	DWR Required Mitigation[3]	Permanent Impacts Description
8	UT to French Broad River/SDF	P / B	38	X	X	2:1	N	Pipe Extension – closing open stream in median by connecting two existing (retained) 54" RCPs with a proposed 54" CSP section.
9	UT to French Broad River/SDF	P / B	30	X	X	2:1	N	Pipe extension - extension of existing 54" RCP due to roadway widening, and energy dissipator pad at outlet.
			X	12	11	N	N	Bank stabilization – at outlet of proposed 54" RCP extension.
12	UT to French Broad River/SDX	P / B	20	X	10	1:1	Y	Pipe extension – extension of existing (retained) 30" RCP due to roadway widening.
13	UT to French Broad River/SDK	P / B	40	X	10	2:1	N	Pipe extension - Extension of existing 60" CMP with a 66" RCP due to roadway widening, and tie-in of a later "V" ditch.
14	UT to French Broad River/SDK	P / B	14	X	X	2:1	N	Pipe extension – Extension of existing 60" CMP with 66" CSP due to roadway widening.
			22	X	7	2:1	N	*Channel change – channel armoring at 66" CSP extension outlet.
15	Powell Creek / SDN	P / C	12	X	X	2:1	N	Pipe extension - extension of existing 10' x 10' RCBC due to roadway widening.
			X	42	10	N	N	Bank stabilization - at inlet of proposed 2 @ 10' x 10' RCBC.
16	Powell Creek / SDN	P / C	16	X	X	2:1	N	Pipe extension - extension of existing 10' x 10' RCBC due to roadway widening.
			X	82	13	N	N	Bank stabilization at outlet of proposed 2 @ 10' x 10' RCBC.
17	UT to French Broad River/SDU	P / B	16	X	X	2:1	N	Pipe extension – extension of existing 48" RCP due to road widening.
			X	10	10	N	N	Bank stabilization at inlet of 2 @ 48" RCP.
18	UT to French Broad River/SDU	P / B	22	X	10	1:1	N	*Channel change – channel armoring (filling scour hole and outlet protection) at outlet of existing (retained) 48" CMP and adjacent 48" high flow WSP.
18A	French Broad River	P / B	10	X	10	2:1	N	*Channel change – replacement of existing wing walls, channel armoring (filling scour hole and outlet protection) at outlet of existing 8' X 8' Concrete Box Culvert.

Permit Site	Stream Name/ NRTR ID[1]	Stream Status[2]/ Class	Permanent Channel Impacts	Bank Stabilization	Temp. Channel Impacts	ACOE Required Mitigation[3]	DWR Required Mitigation[3]	Permanent Impacts Description
20	UT to French Broad River/SDV	P / B	33	X	X	2:1	N	Pipe extension- extension of existing (retained) 42" CMP due to roadway widening.
			X	18	10	N	N	Bank stabilization - at outlet of proposed 42" RCP due to existing 42" CMP extension and proposed 42" WSP.
21	UT to French Broad River/SDW	P / B	27	X	X	2:1	N	Pipe extension – extension of existing (retained) 60" CMP and proposed 42" SWP due to roadway widening.
			24	X	12	2:1	N	*Channel change – realignment of stream to existing 60" CMP and proposed 42" SWP, armoring of channel at inlet to pipes and at tie-in of lateral base ditch.
23	UT to French Broad River/SDX	I / B	312	X	10	1:1	Y	Stream relocation – stream relocated to lateral "V" ditch due to roadway widening.
			9	X	20	1:1	Y	*Channel change – channel armoring at stream due to energy dissipation pad at outlet of proposed 30" stormwater CSP.
			62	X	10	1:1	Y	Pipe placement – proposed 48" WSP with 48" RCB extension to fill slope to replace existing 42" CSP that will be abandoned (plugged and filled).
24	UT to French Bro ad River/SDX	P / B	24	X	10	1:1	Y	*Channel change – channel slightly shifted to align with outlet of proposed 48" WSP with 48" RCP extension, and channel armoring for outlet protection.
24A	UT to French Bro ad River/SDX	P / B	7	X	20	1:1	Y	*Channel change – channel armoring at stream due to energy dissipation pad at outlet of proposed 30" WSP with 30" RCP extension.
25	UT to French Broad River/SEU	P / B	15	X	4	2:1	N	Pipe placement – proposed 30" WSP with 30" RCP extension.
26	UT to French Broad River/SDX	P / B	32	X	5	1:1	Y	Stream relocation – stream relocated into proposed 30" WSP (adjacent to existing 30" CSP to be abandoned) and armoring of standard base ditch at 30" WSP outlet.
27	UT to French Broad River/SDY	P / B	19	x	13	N	N	Pipe extension – existing 30" CMP with 30" RCP extension.
28	UT to French Broad River/SDY	P / B	9	X	18	2:1	N	*Channel change – channel armoring at stream due to energy dissipation pad at outlet of proposed 24" stormwater RCP.

Permit Site	Stream Name/ NRTR ID[1]	Stream Status[2]/ Class	Permanent Channel Impacts	Bank Stabilization	Temp. Channel Impacts	ACOE Required Mitigation[3]	DWR Required Mitigation[3]	Permanent Impacts Description
29	UT to French Broad River/SDX	P / B	X	X	30	N	Y	Temporary impact for construction of a standard base ditch.
			7	X	20	1:1	Y	*Channel change: at outlet of proposed 24" WSP w/ CSP extension.
30	UT to French Broad River/SDX	P / B	9	X	20	1:1	Y	*Channel change – channel armoring at stream due to energy dissipation pad at outlet of proposed 24" stormwater CSP.
			9	X	20	1:1	Y	*Channel change – channel armoring at stream due to energy dissipation pad at outlet of proposed 15" stormwater CSP.
			9	X	18	1:1	Y	*Channel change – channel armoring at stream due to energy dissipation pad at outlet of proposed 15 stormwater CSP.
			77	X	10	1:1	Y	Pipe – proposed 66" WSP w/ 66" RCP extension to replace adjacent 66" CMP that is to be abandoned (inlet end).
31	UT to French Broad River/SDX	P / B	38	X	10	1:1	Y	Pipe extension – proposed 66" WSP with 66" RCP extension (outlet end). Channel change – armoring of channel at 66" RCP outlet for energy dissipation
32	UT to French Broad River/SEQ	P / B	57	X	7	2:1	N	Pipe – extension of proposed 60" WSP that is located adjacent to existing 54" CMP (to be abandoned), with 60" RCP. Channel change – armoring of channel at 66" RCP outlet for energy dissipation.
33	UT to French Broad River/SEQ	P / B	24	X	10	2:1	N	Stream relocation – realignment of existing stream to new 60" RCP w/ 60" RCP extension, and armoring of channel at pipe inlet where toe protection ties in.
			30	X	X	2:1	N	Pipe – proposed 60" WSP w/ 60" RCP extension.
34	UT to French Broad River/SED	P / B	25	X	X	2:1	N	Pipe extension – proposed 36" RCP extension of an existing 36" CMP due to roadway widening.
			30	X	12	2:1	N	Stream relocation – relocated to standard base ditch at inlet of proposed 36" RCP extension for better alignment with RCP extension.

Permit Site	Stream Name/ NRTR ID[1]	Stream Status[2]/ Class	Permanent Channel Impacts	Bank Stabilization	Temp. Channel Impacts	ACOE Required Mitigation[3]	DWR Required Mitigation[3]	Permanent Impacts Description
36	UT to French Broad River/SEF	P / B	28	X	X	2:1	Y	Pipe extension – 42" RCP extension on existing 42" CMP due to roadway widening.
			8	X	10	2:1	Y	*Channel change – armoring channel (toe protection) at outlet of proposed 42" RCP extension for energy dissipation.
37	UT to French Broad River/SEF	P / B	9	X	20	2:1	Y	*Channel change – armoring channel at outlet of proposed 15" RCP extension for energy dissipation.
			356	X	10	2:1	Y	Stream relocation – relocated to adjacent 4' lateral base ditch due to roadway widening.
38	UT to French Broad River/SEE	P / B	18	X	10	1:1	N	Stream relocation – relocated to adjacent 4' lateral base ditch due to roadway widening.
			X	9	20	N	N	Bank stabilization – adjacent to outlet of proposed 15" CSP energy dissipator pad.
			9	X	X	1:1	N	*Channel change – channel armoring for energy dissipator.
			X	X	106	N	N	Temporary impacts from temporary access road for bridge construction. Stream to be placed in pipe to allow for access road construction.
39	UT to French Broad River/SEE	P / B	33	X	X	2:1	N	Pipe – proposed 24" RCP. Impacts from roadway fill and cut and construction of a retaining wall.
			22	X	10	2:1	N	Stream relocation – stream relocated to Retaining Wall gutter.
40	French Broad River	P / B	X	X	245	2:1	N	Temporary impacts from bridge construction causeways.
41	UT to French Broad River/SFG	P / C	X	X	662	N	N	Temporary impacts from temporary access road for bridge construction. Stream to be placed in pipe to allow for access road construction.
			9	X	20	2:1	N	*Channel change – armoring channel at outlet of proposed 15" RCP (replacing adjacent pipe) for energy dissipation.

Permit Site	Stream Name/ NRTR ID[1]	Stream Status[2]/ Class	Permanent Channel Impacts	Bank Stabilization	Temp. Channel Impacts	ACOE Required Mitigation[3]	DWR Required Mitigation[3]	Permanent Impacts Description
42	UT to French Broad River/SFO	P / B	X	X	9	N	N	Temporary impacts from temporary access road for bridge construction. Stream to be placed in pipe to allow for access road construction.
44	UT to French Broad River/SFG	P / C	8	X	20	2:1	N	*Channel change - armoring channel at outlet of proposed 54" WSP with 54" RCP extension (replacing existing 48" CMP – to be abandoned), for energy dissipation.
45	UT to French Broad River/SFR	P / C	21	X	6	2:1	N	Stream relocation – to 4' standard base ditch, to align with inlet of proposed 54" WSP with 54" RCP extension.
46	UT to French Broad River/SFQ	P / C	29	X	x	1:1	N	Pipe extension – extend existing 42" CMP with 42" RCP due to roadway widening.
47	UT to French Broad River/SFQ	P / C	12	X	X	1:1	N	Pipe extension – extend existing 42" CMP with 42" RCP due to roadway widening. Impacts due to extension of an existing 42" RCP due to roadway widening and construction of a lateral base ditch.
			8	X	13	1:1	N	Stream relocation – 4' lateral base ditch tie-in at north side of stream.
			X	9	X	N	N	Bank stabilization – at end of Toe Protection, on south side of stream.
Total Streams Impact:			**2,674**	**282**	**1,601**			
Total Permanent Impacts:			**2,956**					
Total Stream Impact Requiring Mitigation (Total Perm. Impacts – Bank Stabilization):						**2,674†**		

1/ –Stream Number corresponds to I-4400/I-4700 PJD labeling.
2/ - I = Intermittent, P = Perennial.
3/ – USACE stream mitigation is typically at a ratio of 2:1 (unless otherwise noted) and do not require mitigation for bank stabilization impacts; DWR mitigation ratio is 1:1
* riprap to be embedded.
† – Final mitigation requirement will be up to the USACE and DWR. Mitigation for 2,674 LF of permanent stream impact (at 2:1 ratio) has been reserved with DMS to compensate for impacts to sections in final design (I-4700A and I-4700B).

FRENCH BROAD RIVER BRIDGE

Due to the size, staging complexity and environmental concerns, NCDOT has prepared a report encompassing the various aspects and impacts related to the Proposed Construction and Demolition of the I-26 bridges over the French Broad River (*I-26 Bridge Over the French Broad River, Proposed Construction and Demolition*). This report is included as part of this application and can be accessed on the NCDOT permit application website: https://xfer.services.ncdot.gov/pdea/PermApps/I-4400%20and%20I-4700/.

Key portions of this report include:

General Summary	Pages S-1 to S-7
Avoidance and Minimization Measures:	Pages S-1 to S-7
Access Roads:	Page 2
Causeways:	Page 3
Hydraulics/ FEMA Compliance	Page 6
Stormwater/ Erosion Control	Page 10
River User Safety	Page 15

Overall Summary:
As part of the widening of I-26, the existing pair of 6-span, 2-lane bridges that carry I-26 over the French Broad River will be replaced with one 3-span structure that will provide a total of eight travel lanes. The new three-span structure will only have two bents in the river and they will be located at the edge of the water. The current structure includes a total of 5 bents for each bridge, including a bent row in the center of the river).

A *River Safety Plan for the Construction of the I-26 Bridge over the French Broad River* (RSP) has been developed for the project. To ensure the safe passage of river users during the construction and demolition of the I-26 bridge over the French Broad River, NCDOT has developed this RSP to be used in conjunction with the Strategic Communications Plan (SCP) for the Construction of the I-26 Bridge over the French Broad River. The RSP can be accessed at the link above.

A *Strategic Communications Plan for the Construction of the I-26 Bridge over the French Broad River* has been developed. Outlined are: the Goals of the Strategic Communications Plan, lists of the Targeted Audiences, lists of the Implementation Strategies and Tactics (and includes the link to the comprehensive project website), a discussion of the Communication Channels (informing the Public Relations Office of updates to river conditions, and a post of communications to local recipients or posts to social media, or the sending of a news release if major conditions justify such release), lists of the Required Resources, and a Timeline for Plan Implementation. The Plan can be accessed at the link above.

Additionally, a *River User Small Group Meetings* memo addressing public outreach meeting information, along with the presentation from those meetings, is an attachment to this application and can be accessed at the link above.

NCDOT is partnering with NC Emergency Management to provide enhanced flood inundation mapping on the French Broad River upstream of I-26 crossing during the construction of I-4700. The information is being added to Emergency Management's Flood Inundation Mapping and Alert Network (FIMAN) and will be maintained following the completion of the project. The inundation mapping will extend up to Long Shoals Road. An additional stream gauge is being placed at Long Shoals Road to provide better data resolution. In addition, causeway effects will be included in the inundation mapping. More information about FIMAN is located at the link on the previous page of this application. The FIMAN site for the I-4700 construction is planned to be operational by early spring 2019.

NCDOT is partnering with United States Geological Survey to monitor and study the French Broad River during construction of I-4700 and I-4400. The focus of the study will be to evaluate and monitor the geomorphological conditions and water quality of the French Broad River and better determine the discharges from urban streams draining to the French Broad in the project area. The plan is for the study to begin in March of 2019, prior to the Project Let and continue through completion. A copy of the proposal is available upon request.

MORATORIUM

This project is located in a trout watershed. However, pursuant to the October 2, 2017 memo from WRC, there are no trout moratoria for this project.

FEDERALLY PROTECTED SPECIES

Plants and animals with Federal classification of Endangered (E) or Threatened (T) are protected under provisions of Section 7 and Section 9 of the Endangered Species Act of 1973, as amended. As of June 27, 2018, the USFWS lists fifteen (15) federally protected species for Buncombe County, and as of October 17, 2018, lists twelve (12) federally protected species for Henderson County. With species overlap, there are 19 species listed between the two counties (Table 7). The Indiana bat (MYSO), although not listed for either county, has been included in the Table based on the National Park Service (NPS) recording calls that they attributed to MYSO.

Formal Section 7 Consultation is in progress for this project. As such, a Biological Assessment (BA) was prepared to evaluate potential effects on federally listed species. All of the species presented in Table 7 are addressed in the BA (see Section 10.0 Determination of Effects, Table 18 in the BA, pages 126 & 127) (pages 136 & 137 of 364 in the .pdf version). NCDOT submitted the BA to the FHWA on August 16, 2018. The FHWA subsequently submitted the BA to the USFWS on August 20, 2018. It is anticipated that USFWS will issue a Biological Opinion (BO) concurring with the biological conclusions in the BA. As of the date of this permit application, NCDOT has not yet received the BO. Upon receipt, the BO will be provided to the USACE for consideration. A copy of the BA is included on the website at the link on the previous page of this application.

Table 7 – Federally protected species listed for Buncombe and Henderson Counties

Scientific Name	Common Name	Federal Status*	Biological Conclusion	County(ies)
Alasmidonta raveneliana	Appalachian elktoe	E	MA-LAA	Buncombe / Henderson
Solidago spithamaea	Blue Ridge goldenrod	T	No Effect	Buncombe
Glyptemys muhlenbergii	Bog turtle	T(S/A)	Not Required	Buncombe / Henderson
Sagittaria fasciculata	Bunched arrowhead	E	No Effect	Buncombe / Henderson
Glaucomys sabrinus coloratus	Carolina northern flying squirrel	E	No Effect	Buncombe / Henderson
Myotis grisescens	Gray bat	E	Probable / Potential	Buncombe / Henderson
Myotis sodalist [1/]	Indiana bat	E	MA-NLAA	Not listed
Sarracenia rubra ssp. *jonesii*	Mountain sweet pitcher plant	E	No Effect	Buncombe / Henderson
Myotis septentrionalis	Northern long-eared bat (NLEB)	T	MA-NLAA	Buncombe / Henderson
Gymnoderma lineare	Rock gnome lichen	E	No Effect	Buncombe
Bombus affinis	Rusty-patched bumble bee	E	Not Required	Buncombe / Henderson
Isotria medeoloides	Small whorled pogonia	T	No Effect	Henderson
Erimonax monachus	Spotfin chub (= turquoise shiner)	T	No Effect	Buncombe
Geum radiatum	Spreading avens	E	No Effect	Buncombe
Microhexura montivaga	Spruce-fir moss spider	E	No Effect	Buncombe
Helonias bullata	Swamp pink	T	No Effect	Henderson
Epioblasma florentina walkeri (=E. *walkeri)*	Tan riffleshell	E	No Effect	Buncombe
Spiraea virginiana	Virginia spiraea	T	No Effect	Buncombe
Platanthera integrilabia	White fringeless orchid	T	No Effect	Henderson
Sisyrinchium dichotomum	White irisette	E	No Effect	Henderson

* T – Threatened, E – Endangered, T(S/A) Threatened due to similarity of appearance.

[1/] MYSO does not appear on the USFWS list of protected species for Buncombe or Henderson Counties; however, NPS recorded calls they attributed to MYSO on the Blue Ridge Parkway property, so it has been included in the Table.

INDIRECT CUMULATIVE IMPACT ANALYSIS

Existing rules for the 401 Water Quality Certification Program (15A NCAC 2H .0506(b)(4) require that the DWR determine that a project "does not result in cumulative impacts, based on past or reasonably anticipated future impacts, that cause or will cause a violation of downstream water quality standards."

An Indirect Screening Report was completed for this project, dated November 2013. Copies of this report are available upon request. This report concluded the following:

Indirect and Cumulative Effects to the Human Environment

Indirect Effects

Due to the growing and planned expansion of sewer service throughout the Future Land Use Study Area (FLUSA), relatively economical housing prices, anticipated growth of local jobs in the area, and expected moderate population growth, the local market for development is relatively robust at present. Land use throughout the FLUSA is mixed, consisting of large sections of residential areas, commercial and industrial stretches, and agricultural tracts. Commercial development is largely concentrated near the I-26 interchanges with US 64, NC 280 (Airport Road), NC 146 (Long Shoals Road), and NC 191 (Brevard Road). The Buncombe and Henderson County planners expect the I-26 corridor to largely maintain its mix of residential and commercial characteristics, with the exception of changes to land uses at the projects involving Upward Road, Howard Gap Road, and the proposed Balfour Parkway. Planners anticipate the improvements to these facilities will entice more use by local travelers and therefore lead to development pressures along these existing facilities, which in turn could lead to more traffic utilizing I-26 in the project corridor. However, potential land use effects as a result of the I-4400/I-4700 project are somewhat tempered by the fact that the project is not expected to provide any new access or opportunities for traffic exposure to properties in the FLUSA and will generate marginal travel time savings.

Based on this assessment of the currently identified project alternatives, the I-4400/I-4700 project is not expected to have a notable indirect effect on land use in the FLUSA. Furthermore, any direct natural environmental impacts by the project would be addressed through Programmatic Agreements with resource agencies during the Merger and Permitting processes. Developments will also be required to follow local, state, and federal guidelines and permitting regulations. (I-4400/I-4700 Indirect and Cumulative Effects Screening Report, HNTB, 2013)

Cumulative Effects

In terms of analyzing the potential for cumulative effects, NCDOT contracted with URS Corp. to complete the Asheville Regional Cumulative Effects Study (CES) for this project and other planned projects for Asheville and the surrounding areas. The CES examined a study area larger than the FLUSA delineated for STIP I-4400/I-4700 and encompassed a number of projects beyond, but including, the scope of the I-26 widening. The CES analyzed the potential cumulative effects of projects from the cities, counties, French Broad River MPO (FBRMPO), and major projects planned by private sector businesses and institutional entities within the region to determine their potential cumulative effects. The horizon year selected for the

cumulative effects assessment is 2035, which corresponds with the fiscally-constrained Long-Range Transportation Plan prepared by the FBRMPO.

Cumulative effects are the result of when the effects of an action, such as a proposed transportation project, or a group of similar actions such as transportation improvements proposed within a regional area, are added to or interact with other actions in an established spatial and temporal boundary. The disclosure of these effects, whether beneficial or adverse, was the focus of the CES. The concept of cumulative effects assessment takes into account known actions having the potential to affect a resource over a specified timeframe. In addition, the term "effect" is primarily qualitative in nature, while "impact" is primarily quantitative in nature.

The Cumulative Effects Tool indicated that cumulative effects were rated as a medium level of concern as a result of the reasonably-foreseeable transportation projects in the region. When analyzing and evaluating the overall impacts and how those impacts contribute to cumulative effects; plans, policies, practices, and trends in the region indicate that the nature of the projects listed previously are such that growth and development and their associated impacts on the four major resource categories in the region are likely to continue independent of the projects. There are, however, a number of external influences and recommendations that have the potential to influence both trends in the area and the results of this study.

Some amount of cumulative impacts can be expected for notable cultural, community, water quality, and natural habitat features. This is due to features having minimal incorporation in local planning protections and/or policies. It appears that notable cultural features are prevalent in planning regulations, whereas water quality and natural habitat features are unique resources that are both under-protected and under-recognized. For community, water quality, and natural habitat features, present and future policies do indicate shifts in including these attributes, but they have historically not been prioritized for protection.

Community Resources

The original construction of both I-26 and I-40 severed a number of communities within the greater Asheville area. Currently, some of the most economically-depressed and highest percentage minority populations live along these corridors. Relocations and other direct impacts may result in additional stress to these low income and minority communities and constitute a recurring impact. These areas are located along the corridors through Weaverville and Woodfin, near Swannanoa, within Asheville, and in Henderson County. Although individually the projects may not have notable effects on these communities, cumulatively, the projects could result in additional stress to regional low-income and minority populations.

Water Resources

The French Broad River is a major feature in the region, bisecting Buncombe County, while providing a water source for a large portion of the study area. Due to the topography of the region, most other rivers, streams, and creeks flow into the French Broad River. In addition, the Forks of Ivy watershed is located along the border of Buncombe and Madison counties. This watershed is the primary surface water source for a large portion of northern Buncombe County and southern Madison County. The Hominy Creek watershed is located in southern Asheville and contains Hominy Creek and South Hominy Creek. Hominy Creek, the French Broad River, Clear Creek, Devils Fork, Bat Fork, Ivy Creek, Mills River, Mud Creek, and Cane Creek are

listed on both the approved 2012 303(d) listed impaired waters, as well as the draft 2014 303(d) list, according to the North Carolina Division of Water Resources. Buncombe County currently does not afford streams any additional protection outside of state standards, while Henderson County requires a 30-foot riparian buffer around all perennial streams. Buncombe County is currently considering expanding its ordinances to afford these resources extra protection.

All of the projects will address increases in impervious surfaces and associated stormwater runoff in the individual project design through the use of best management practices (BMP). It is possible that these projects could have cumulative impacts when combined with the on-going urbanization and suburbanization of the region due to private development actions. The increases in impervious surfaces associated with the construction of buildings, homes, and parking areas could lead to a deterioration of water quality in the absence of BMP's.

Natural Resources

Many of the natural resources are located within areas already designated for protection such as National and State Parks, areas of steep slope, or areas designated for conservation. Through the creation of a Land Conservation Advisory Board as well as cooperation with the Southern Appalachian Highlands Conservancy Land Trust, Buncombe County is promoting the use of voluntary land conservation easements, identifying high priority focus areas, and generating financial resources to slowly increase their holdings of lands for conservation; however, the county has indicated that future additions to these holdings will be difficult due to increasing prices, loss of funding, and lack of large, contiguous parcels.

Local planners indicated that there are still active agricultural areas in close proximity to the transportation corridors. As such, Voluntary Agricultural Districts (VAD) and Enhanced Voluntary Agricultural Districts (EVAD) are included, as they demonstrate local commitment to preserving agricultural lands, while prime farmland soils and other agricultural lands are protected under the Farmland Protection Policy Act (FPPA) and impacts to these should be considered. Christmas tree and berry farming are two large agricultural industries in the western region of North Carolina.

Travel Demand

The widening along the length of I-26, when considered as individual State Transportation Improvement Program (STIP) projects, are not likely to change travel times by more than five minutes outside of peak hours; however, when viewed cumulatively, travel time savings could result along the length of the corridor. This could potentially lead to increased traffic volumes as travelers, currently traveling along parallel arterial routes, would be inclined to use the less congested interstate routes. A regional traffic model is currently being developed to help determine the relative impact that a potential project, as well as multiple projects, could have on the overall transportation network. This model is expected to be adopted by the French Broad River (FBR) Metropolitan Planning Organization (MPO) in 2015. (Asheville Regional Cumulative Effects Study, URS, 2014).

Update

In November 2017, NCDOT prepared an update to the original Indirect Screening Report (2013) for I-4400/I-4700. After completion of the 2013 Screening Report, additional populations of the federally protected Appalachian elktoe were discovered in the French Broad River. In light of this new information, the Future Land Use Study Area (FLUSA) was expanded to include parts

of the French Broad River where the mussels were found. The Indirect Screening Matrix was updated to reflect the expansion of the FLUSA and the updated information to the Notable Environmental Features section. The reports concluded the following:

The results of the 2017 Indirect Screening Report reassessment indicate that potential land use effects as a result of the I-4400/I-4700 project are still moderately low. Despite the apparently large amount of available land, local officials suggest there are a number of constraints to development in the FLUSA, notably natural environmental features and topography, as well as the sizable extent of land occupied by Biltmore Estate in the northern section of the FLUSA. Potential land use effects as a result of the I-4400/I-4700 project are generally tempered by the fact that the project is not expected to provide any new access or opportunities for traffic exposure to properties in the FLUSA and will generate marginal travel time savings.

Based on this assessment, the I-4400/I-4700 project is not expected to have a notable indirect effect on land use or development patterns in the FLUSA. In addition, because few indirect impacts are anticipated, the cumulative effect of this project when considered in the context of other past, present, and future actions, and the resulting impact on the notable human and natural features should also be minimal.

CULTURAL RESOURCES

In order to comply with Section 106 of the National Historic Preservation Act (1966, as amended), FHWA and NCDOT must evaluate the project's impact upon any extant architectural and archaeological resources and determine if additional measure will be necessary to mitigate any adverse effects of the project upon any significant properties and sites.

Archaeological Resources:

In its September 2014 memorandum, NCDOT recommended that no further archaeological work was necessary for the majority of the project study area. Impacts will remain within the disturbed I-26 right of way and will only extend outside the right of way to cut back steep slopes that are unlikely to yield significant archaeological sites. However, a reconnaissance of two known archaeological sites possibly within the project limits was determined necessary. The HPO provided their concurrence on these findings in a letter dated October 16, 2014. NCDOT's letter from October 22, 2014, details the results of the reconnaissance of two archaeological sites and recommends no additional work at either. HOP concurred with the results in a memorandum dated November 18, 2014 and concludes that no further work is needed for these sites in association with the project.

A memorandum from the National Park Service-Blue Ridge Parkway (NPS-BRP) archeologist, dated July 22, 2015, noted that the area included within the proposed Blue Ridge Parkway APE was previously disturbed during initial construction and grading of the parkway. It is the determination of the BRP archaeologist that no archaeological sites would be affected by the proposed project.

This, and further information, can be found in the DEIS, dated August 9, 2016, and in a Memorandum of Agreement, included in Appendix L of the Final EIS (pending).

Historic Architectural Resources:

As identified in the *Historic Architectural Resources Survey Report* (MdM Historical Consultants, 2014; 2016), nine resources within the APE are eligible or listed on the NRPH. These sites include: McMurray House (Windy Hill) (HN1904), Camp Orr (Camp Pinewood) (HN1905), Sholtz-Cantrell Estate (HN0059), Hyder Dairy Farm (HN1906), Mountain Sanitarium (HN1907), Rugby Grange (HN0042), Cureton House (HN1912), Blue Ridge Parkway (HC0001), and Biltmore Estates (BN0004). These resources were discussed in the DEIS for each detailed study alternative and discussed in the FEIS for the Preferred Alternative. The preferred Alternative would require right of way from some of the resources. At meetings on May 19, 2015, April 26, 2016, and July 25, 2017, representatives from the NCDOT, FHWA, and HOP reached concurrence on the effects of the proposed alternative on these resources. All of these resources, with the exception of the Blue Ridge Parkway had an Effects Finding of No Effect or No Adverse Effect [4(f) *de minimus*]. The Blue Ridge Parkway had an Effects Finding of Adverse Effect [4(f)]. The effects findings for the Preferred Alternative are listed in Table 1 of the FEIS. The Memorandum of Agreement (MOA) is included in Appendix L of the FEIS.

4(f) Resources

The Preferred Alternative results in the Section 4(f) use of Camp Orr, Hyder Dairy Farm, French Broad River Paddle Trail, Blue Ridge Parkway, Mountain-to-Sea Trail (MST), and Biltmore Estates. Through consultation with the officials with jurisdiction, it was determined that the minor use of Camp Orr, Hyder Dairy Farm, French Broad River Paddle Trail, MST, and Biltmore Estates results in *de minimis* impacts for these properties. Refer to the *Final Section 4(f) Evaluation* in Chapter 6 of the FEIS.

The Preferred Alternative also results in the Section 4(f) use of the Blue Ridge Parkway. The *Final Section 4(f) Evaluation* (refer to Chapter 6 of the FEIS) includes the determination no prudent and feasible alternatives, least overall harm analysis and measures to minimize harm to the Section 4(f) property. The NCDOT and FHWA will continue to coordinate with the NPS in the proposed use of the Blue Ridge Parkway.

FEMA COMPLIANCE

The project has been coordinated with appropriate state and local officials and the Federal Emergency Management Agency (FEMA) to assure compliance with FEMA, state, and local floodway regulations.

WILD AND SCENIC RIVER SYSTEM

The project will not impact any designated Wild and Scenic Rivers or any rivers included in the list of study rivers (Public Law 90-542, as amended).

MITIGATION OPTIONS

The NCDOT is committed to incorporating all reasonable and practicable design features to avoid and minimize jurisdictional impacts, and to provide full compensatory mitigation of all remaining, unavoidable jurisdictional impacts. Avoidance measures were taken during the planning and NEPA compliance stages, and minimization measures were incorporated as part of the project design.

Avoidance and Minimization

Section 404 of the Clean Water Act

- Reduction of slope stake limits from 4:1 (with a 40-foot buffer) to 2:1 (with a 25-foot buffer) in I-4400 resulted in a reduction of approximately 6,624 ft of stream impacts and 1.2 acres of wetland impacts.
- In I-4700 the reduction of slope stake limits from 4:1 (with a 40-foot buffer) to a variable 2:1, 1:1.5, and 1:1 (no buffer) resulted in a reduction in stream impacts of 13,998 feet, approximately 57 percent, and a reduction of 10.9 acres of wetland impacts, approximately 93 percent. Slope stakes were steepened to 1.5:1 with rock plating to avoid or reduce impacts to Wetlands WBV, WCA, WCC, WCE, WCG, and WCH.
- Impacts to the Biltmore Bog (Wetland ID WCH) have been minimized from 3.36 acres when using 4:1 slope stake limits with a buffer of 40 feet to 0.009 acres, final design slope stake limits. A reduction of 3.351 acres or approximately 99.7 percent.
- By reducing slope stake limits from 4:1 to 2:1, two ponds were completely avoided.
- Widening predominately to the inside median avoided or reduced impacts to parallel streams and wetlands.
- Retaining walls were used to avoid impacts to approximately 2,730 linear feet of Stream SFG.
- The roadway alignment was shifted away from the bifurcated section on eastbound I-26 avoiding impacts to streams and wetlands.

Replacement of the I-26 bridge over the French Broad River

- Three-span bridge design:
  - Reduces number of bents in the water.
  - Does not require a center bent.
  - Requires a smaller causeway to build.
  - Reduced time to construct.

- Causeways will be used for construction and demolition.
  - Do not require drilled piles.
  - Reduces time to build the I-26 bridge to 3 to 4 years.
  - Removes an obstacle in the air (eliminating impediment to gray bat flight).

- Causeway design and use.

- Increased amount of river free flow area at maximum causeway construction from an initial 28 percent to 51 percent in the current design.
- Minimization of causeway during each stage by adding/removing material.
- Causeway extension (Stage 4) will be sloped to allow water to flow over top; reducing overall impact to channel flow.
- For bank stability and to prevent scour, one layer of rock will be left behind until the end of construction/demolition.
- To minimize disturbance to the riverbed, all readily detectable causeway material will be removed to the extent practicable, while removing as little of the original riverbed as possible.
- NCDOT shall require the contractor to use clean stone for the construction of the causeways. This will minimize unnecessary sediment input into the river.
- All stone will be removed and disposed of off-site, or the stone can be used in areas that require permanent stone protection after project completion. NCDOT shall also require that concrete barriers (barrier rail) be placed along the downstream edge of each causeway to limit the downstream movement of causeway material during high flow events.
- Construction fabric will not be used under the causeway material, because it tends to tear into pieces and float downstream during removal.
- With the exceptions noted for the drill rig and crane, all construction equipment will be refueled outside the 100-year floodplain or at least 200 feet from all water bodies (whichever distance is greater) and be protected with secondary containment. During crucial periods of construction and demolition, when the drill rig and crane cannot be moved, the drill rig and crane can be refueled while inside the 100-year floodplain provided that spill response materials (such as spill blankets and fueling diapers) are used during the refueling. Hazardous materials, fuel, lubricating oils, or other chemicals will be stored outside the 100-year floodplain or at least 200 feet from all water bodies (whichever distance is greater) and not in a Water of the U.S. Areas used for borrow or construction by-products will not be located in wetlands or in the 100-year floodplain.
- Equipment that is placed on the causeways will be removed any time throughout a work day when the water level rises, or is expected to rise overnight, to a point where the equipment could be flooded, or during periods of inactivity (two or more consecutive days). The only exception to this measure is that the drill rig and crane may be left in place for periods of inactivity; however, it must also be removed if the water rises, or is expected to rise, to a point where the drill rig and crane could be flooded.
- NCDOT shall require the contractor to use brand new or steam cleaned equipment to access causeways that are underwater if these causeways are utilized for removal of existing bents in underwater conditions.

- Sedimentation and Erosion Control
  - Implementation of NCDOT's Best Management Practices for the Protection of Surface Waters (BMPs) will minimize impacts to water resources during the pre-construction, construction, maintenance, and repair situations.
  - Use of Design Standards in Sensitive Watersheds [15A NCAC 04B .0124 (a) – (e)]

        - From the Blue Ridge Parkway bridge to the northern terminus of the project.
        - For portions of the project within 1 mi. and draining directly to streams that are identified as NCDEQ and/or NCWRC designated trout streams.
        - For portions of the project within 1 mi. and draining directly to streams where aquatic threatened or endangered species are present.
    - Environmentally Sensitive Areas will be defined by a 50-ft. buffer zone on both sides of jurisdictional streams measured from top of streambank, in which the following shall apply:
        - The Contractor may perform clearing operations, but not grubbing operations until immediately prior to beginning grading operations.
        - Once grading operations begin, work shall progress in a continuous manner until complete.
        - Erosion control devices shall be installed immediately following the clearing operation.
        - Seeding and mulching shall be performed on the areas disturbed by construction immediately following final grade establishment.
        - Seeding and mulching shall be done in stages on cut and fill slopes that are greater than 20 feet in height measured along the slope, or greater than 2 acres in area, whichever is less.
        - All sedimentation and erosion control measures, throughout the project limits, must be cleaned out when half full of sediment, to ensure proper function of the measures.
    - NCDOT shall install a rainfall data logger at the French Broad River and other sensitive locations to continuously monitor and record rainfall events.
    - NCDOT shall commit to self-reporting SEC device failures to USFWS that result from excessive rainfall events (intensity that exceeds 25-year storm event).
    - NCDOT shall commit to channel morphology monitoring.
    - If monitoring at the French Broad River reveals excessive bank erosion, bank instability, and sedimentation associated with the bridge replacement, NCDOT will work to identify the cause and will make improvements to address the problems in a timely manner.

- Stormwater Control
    - NCDOT will prepare a stormwater management plan (SMP) that implements structural and non-structural post-construction stormwater BMPs to the maximum extent practical (MEP), which is consistent with the Department's National Pollutant Discharge Elimination System (NPDES) Post-Construction Stormwater Program.
    - NCDOT recognizes that suitable Stormwater Control measures for one species may be detrimental to another and therefore resolves to coordinate BMPs with the State Hydraulics Engineer and USFWS.

- Minimization of impacts to French Broad River users:
    - NCDOT shall develop a Communication Plan, specific to the construction and demolition of the French Broad River bridge, to inform stakeholders.

- NCDOT shall require the contractor to use a catchment system to avoid having construction/demolition debris fall on river users, equestrian and bicyclists using Old River Road, or in the water.
- NCDOT shall use a floating navigational aid to direct river users to the "safe zone" of the river, away from construction.
- NCDOT shall place steady-state, solar-powered red lights on the causeway to alert river users to its location. Generators will not be used to provide power.
- NCDOT shall place signs at river inputs upstream and downstream of the construction zone to alert river users to the I-26 bridge construction.

Compensation:

The NCDOT has avoided and minimized impacts to jurisdictional resources to the greatest extent practicable as described above. Tables 2 and 3 summarize the wetland and stream impacts for this phased project and the associated mitigation requirements. NCDOT has obtained compensatory mitigation for 2.37 acres of wetland impacts and 9,481 linear feet of stream impact from the DMS to compensate for impacts to features in sections that are in final design (I-4700A and I-4700B) and in sections that are in preliminary design (I-4400BA, I-4400BB, and I-4400C). Section I-4400A is post year, thus not requiring mitigation currently.

REGULATORY APPROVALS

Section 404 and Section 10: Application is hereby made for a USACE Individual 404 and Section 10 Permit as required for the above-described activities.

Section 401: We are hereby requesting a 401 Water Quality Certification from the N. C. Division of Water Resources. In compliance with Section 143 215.3D(e) of the NCAC, we will provide $570.00 to act as payment for processing the Section 401 permit application previously noted in this application (see Subject line).

Thank you for your assistance with this project. If you have any questions or need additional information, please contact Bill Barrett at wabarrett@ncdot.gov or (919) 707-6103. A copy of this application and distribution list will also be posted on the NCDOT website at: https://xfer.services.ncdot.gov/pdea/PermApps/.

Sincerely,

for Philip S. Harris, P.E., C.P.M.
Environmental Analysis Unit Head

cc:
NCDOT Permit Application Standard Distribution List.

U.S. ARMY CORPS OF ENGINEERS

APPLICATION FOR DEPARTMENT OF THE ARMY PERMIT

33 CFR 325. The proponent agency is CECW-CO-R.

Form Approved - OMB No. 0710-0003 Expires: 30-SEPTEMBER-2015

Public reporting for this collection of information is estimated to average 11 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of the collection of information, including suggestions for reducing this burden, to Department of Defense, Washington Headquarters, Executive Services and Communications Directorate, Information Management Division and to the Office of Management and Budget, Paperwork Reduction Project (0710-0003). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number. Please DO NOT RETURN your form to either of those addresses. Completed applications must be submitted to the District Engineer having jurisdiction over the location of the proposed activity.

PRIVACY ACT STATEMENT

Authorities: Rivers and Harbors Act, Section 10, 33 USC 403; Clean Water Act, Section 404, 33 USC 1344; Marine Protection, Research, and Sanctuaries Act, Section 103, 33 USC 1413; Regulatory Programs of the Corps of Engineers; Final Rule 33 CFR 320-332. Principal Purpose: Information provided on this form will be used in evaluating the application for a permit. Routine Uses: This information may be shared with the Department of Justice and other federal, state, and local government agencies, and the public and may be made available as part of a public notice as required by Federal law. Submission of requested information is voluntary, however, if information is not provided the permit application cannot be evaluated nor can a permit be issued. One set of original drawings or good reproducible copies which show the location and character of the proposed activity must be attached to this application (see sample drawings and/or instructions) and be submitted to the District Engineer having jurisdiction over the location of the proposed activity. An application that is not completed in full will be returned.

(ITEMS 1 THRU 4 TO BE FILLED BY THE CORPS)

1. APPLICATION NO.	2. FIELD OFFICE CODE	3. DATE RECEIVED	4. DATE APPLICATION COMPLETE

(ITEMS BELOW TO BE FILLED BY APPLICANT)

5. APPLICANT'S NAME	8. AUTHORIZED AGENT'S NAME AND TITLE (agent is not required)
First - Phil Middle - S Last - Harris	First - Middle - Last -
Company - NCDOT	Company -
E-mail Address - pharris@ncdot.gov	E-mail Address -
6. APPLICANT'S ADDRESS:	9. AGENT'S ADDRESS:
Address- 1598 Mail Service Center	Address-
City - Raleigh State - NC Zip - 27699 Country - USA	City - State - Zip - Country -
7. APPLICANT'S PHONE NOs. w/AREA CODE	10. AGENTS PHONE NOs. w/AREA CODE
a. Residence b. Business 91-707-6001 c. Fax	a. Residence b. Business c. Fax

STATEMENT OF AUTHORIZATION

11. I hereby authorize, _____ to act in my behalf as my agent in the processing of this application and to furnish, upon request, supplemental information in support of this permit application.

_____ _____

SIGNATURE OF APPLICANT DATE

NAME, LOCATION, AND DESCRIPTION OF PROJECT OR ACTIVITY

12. PROJECT NAME OR TITLE (see instructions)

I-4400 / I-4700

13. NAME OF WATERBODY, IF KNOWN (if applicable)	14. PROJECT STREET ADDRESS (if applicable)
French Broad River	Address
15. LOCATION OF PROJECT Latitude: ◦N 35.432347 Longitude: ◦W 82.530633	City - State- Zip-

16. OTHER LOCATION DESCRIPTIONS, IF KNOWN (see instructions)

State Tax Parcel ID Municipality

Section - Township - Range -

17. DIRECTIONS TO THE SITE

Please see attached Vicinity Map and Cover Letter.

18. Nature of Activity (Description of project, include all features)

The North Carolina Department of Transportation (NCDOT) proposes to improve a 22.2 mile section of Interstate 26 (I-26) in Henderson and Buncombe Counties, beginning just south of Hendersonville in Henderson County, and ending just south of Asheville, in Buncombe County. The project is included in the 2016-2025 State Transportation Improvement Program (STIP) as two projects: STIP Projects I-4400 and I-4700. STIP I-4400 begins at the US 25 Connector (Exit 54) south of Henderson, and extends along I-26 to NC 280 (Airport Road - Exit 40), a distance of 13.6 miles. STIP Project I-4700 extends north along I-26 from NC 280 (Airport Road - Exit 40) to the I-40 interchange, a distance of 8.6 miles. The replacement of the existing Blue Ridge Parkway bridge over I-26, will be completed in conjunction with STIP I-4700. Additionally, the rest areas along I-26, south of Fanning Bridge Road (SR 3539) overpass in Henderson County, will also be reconstructed as part of STIP I-4400. This project is also included in the French Broad River Metropolitan Planning Organization's (FBRMPO) 2040 Long Range Transportation Plan (LRTP).

19. Project Purpose (Describe the reason or purpose of the project, see instructions)

The purpose of the proposed project is to reduce congestion, with a goal of achieving an overall Level of Service (LOS) D in the design year (2040), and improve the pavement structure. The need of the project is to improve existing and projected roadway capacity deficiencies, and improve insufficient pavement structure and deteriorating existing road surface conditions.

USE BLOCKS 20-23 IF DREDGED AND/OR FILL MATERIAL IS TO BE DISCHARGED

20. Reason(s) for Discharge

Impacts will result from widening of I-26 roadway and shoulders, construction of a new bridge over the French Broad River, and new interchanges.

21. Type(s) of Material Being Discharged and the Amount of Each Type in Cubic Yards:

Type Amount in Cubic Yards	Type Amount in Cubic Yards	Type Amount in Cubic Yards
see attached Cover Letter.		

22. Surface Area in Acres of Wetlands or Other Waters Filled (see instructions)

Acres

or

Linear Feet see attached Cover Letter.

23. Description of Avoidance, Minimization, and Compensation (see instructions)

see attached Cover Letter.

24. Is Any Portion of the Work Already Complete? ☐ Yes ☒ No IF YES, DESCRIBE THE COMPLETED WORK

25. Addresses of Adjoining Property Owners, Lessees, Etc., Whose Property Adjoins the Waterbody (if more than can be entered here, please attach a supplemental list).

a. Address- see attached Permit Drawings.

City - State - Zip -

b. Address-

City - State - Zip -

c. Address-

City - State - Zip -

d. Address-

City - State - Zip -

e. Address-

City - State - Zip -

26. List of Other Certificates or Approvals/Denials received from other Federal, State, or Local Agencies for Work Described in This Application.

AGENCY	TYPE APPROVAL*	IDENTIFICATION NUMBER	DATE APPLIED	DATE APPROVED	DATE DENIED

* Would include but is not restricted to zoning, building, and flood plain permits

27. Application is hereby made for permit or permits to authorize the work described in this application. I certify that this information in this application is complete and accurate. I further certify that I possess the authority to undertake the work described herein or am acting as the duly authorized agent of the applicant.

Carla Brown 12/3/18

SIGNATURE OF APPLICANT DATE SIGNATURE OF AGENT DATE

for Philip S. Harris

The Application must be signed by the person who desires to undertake the proposed activity (applicant) or it may be signed by a duly authorized agent if the statement in block 11 has been filled out and signed.

18 U.S.C. Section 1001 provides that: Whoever, in any manner within the jurisdiction of any department or agency of the United States knowingly and willfully falsifies, conceals, or covers up any trick, scheme, or disguises a material fact or makes any false, fictitious or fraudulent statements or representations or makes or uses any false writing or document knowing same to contain any false, fictitious or fraudulent statements or entry, shall be fined not more than $10,000 or imprisoned not more than five years or both.

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
TIM BAUMGARTNER
Director

NORTH CAROLINA
Environmental Quality

December 03, 2018

Mr. Philip S. Harris, P.E., CPM
Environmental Analysis Unit
North Carolina Department of Transportation
1598 Mail Service Center
Raleigh, North Carolina 27699-1598

Dear Mr. Harris:

Subject: DMS Mitigation Acceptance Letter:

I-4700 A&B, I-4400BA, I-4400C, I-4400BB, I-26, Henderson County

The purpose of this letter is to notify you that the Division of Mitigation Services (DMS) will provide the stream and wetland mitigation for the subject project. Based on the information supplied by you on December 3, 2018, the impacts are located in CU 06010105 of the French Broad River basin in the Southern Mountains (SM) Eco-Region, and are as follows:

Stream and Wetland Impacts	River Basin	CU Location	Eco-Region	Stream			Wetlands		
				Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh
I-4700 A&B	French Broad	06010105	SM	3,500	0	0	2.0	0	0
I-4400BA	French Broad	06010105	SM	185	0	0	0	0	0
I-4400C	French Broad	06010105	SM	4,268	0	0	0.77	0	0
I-4400BB	French Broad	06010105	SM	2,354	0	0	0.04	0	0

*Some of the impacts may be proposed to be mitigated at a 1:1 mitigation ratio. See permit application for details.

DMS commits to implementing sufficient compensatory mitigation credits to offset the impacts associated with this project as determined by the regulatory agencies in accordance with the In-Lieu Fee Instrument dated July 28, 2010. If the above referenced impact amounts are revised, then this mitigation acceptance letter will no longer be valid and a new mitigation acceptance letter will be required from DMS

If you have any questions or need additional information, please contact Ms. Beth Harmon at 919-707-8420.

Sincerely,

James B. Stanfill
DMS Asset Management Supervisor

Cc: Ms. Carla Dagnino and Linda Fitzpatrick, NCDOT, Environmental Analysis Unit
Mr. Monte Matthews, USACE – Raleigh Regulatory Field Office
Ms. Amy Chapman, NC Division of Water Resources
File: I-4700 A&B, I-4400BA, I-4400C, I-4400BB

North Carolina Department of Environmental Quality | Division of Mitigation Services
217 W. Jones Street | 1652 Mail Service Center | Raleigh, North Carolina 27699-1652
919.707.8976

October 11, 2018

I-26 Widening

STIP Project Nos. I-4400 & I-4700

US 25 (exit 54) in Henderson County to I-40 in Buncombe County including Blue Ridge Parkway Bridge over I-26

Section 404/NEPA Merger Project Team Meeting Agreement

Concurrence Point 4B

30 Percent Hydraulic Design Review

Meeting Date: August 14, 2018

Time: 9:00 a.m. to 1:00 p.m.

Place: NCDOT Division 13 Conference Room, 55 Orange St, Asheville

Project: I-26 Widening in Henderson and Buncombe Counties, Federal Aid Project No. NHF-26-1(62)23/IMNHF-026-1(86)9, WBS No. 34232.1.1/36030.1.1, STIP Project Nos. I-4400/I-4700, NCDOT Divisions 13 and 14

Purpose: Achieve Merger Team concurrence on Concurrence Point (CP) 4B, 30 Percent Hydraulic Review, for I-4700 A and B

Meeting Attendees:

Name	Agency	Email address	Phone
Felix Davila	FHWA	felix.davila@dot.gov	919-747-7021
Loretta Beckwith	USACE	loretta.a.beckwith@usace.army.mil	828-271-7980 x4223
Marella Buncick	USFWS	marella_buncick@fws.gov	828-258-3939 x237
Lyuba Zuyeva	French Broad River MPO/Land of Sky	lyuba@landofsky.org	828-251-7454
Tristan Winkler	Land of Sky RPO	tristan@landofsky.org	828-251-6622 x138
Kevin Barnett	NCDEQ DWR	kevin.barnett@ncdenr.gov	828-296-4657
Marla Chambers	NCWRC	marla.chambers@ncwildlife.org	704-244-8907
Roger Bryan	NCDOT – Division 13	rdbryan@ncdot.gov	828-251-6171 x221
Randy McKinney	NCDOT – Division 13	rmckinney@ncdot.gov	828-298-0080
Brendan Merithew	NCDOT – Division 13	bwmerithew@ncdot.gov	828-257-6171

Name	Agency	Email address	Phone
Steve Cannon	NCDOT – Division 13	slcannon@ncdot.gov	828-251-6171
Ted Adams*	NCDOT – Division 14	tadams@ncdot.gov	828-631-1155
Wanda Austin	NCDOT – Division 14	whaustin@ncdot.gov	828-631-1148
Josh Deyton	NCDOT – Division 14	jbdeyton@ncdot.gov	828-488-0902
David McHenry*	NCDOT – Division 14	dgmchenry@ncdot.gov	828-586-4043
Mike Patton	NCDOT – Division 14		
Richard Hensley	NCDOT – L&S Region III	rhensley@ncdot.gov	828-667-9616
Bill Barrett*	NCDOT – Natural Environment Section	wabarrett@ncdot.gov	919-707-6103
Marissa Cox*	NCDOT – Natural Environment Section	mrcox@ncdot.gov	919-707-6135
Carla Dagnino*	NCDOT – Natural Environment Section	cdagnino@ncdot.gov	919-707-6110
Mark Staley*	NCDOT – Roadside Environmental	mstaley@ncdot.gov	919-707-2948
Kevin Moore*	NCDOT – Roadway Design	kmoore@ncdot.gov	919-707-6287
Kevin Fischer*	NCDOT – Structures	wkfischer@ncdot.gov	919-707-6514
Kat Bukowy	HNTB	kbukowy@hntb.com	919-424-0441
Matt Foster	HNTB	mfoster@hntb.com	919-424-0460
Aaron Castro	HNTB	acastro@hntb.com	816-527-2492
Jeff Hess	HNTB	jhess@hntb.com	704-208-5363
Joe Olson	HNTB	jsolson@hntb.com	919-424-0480

*attended by phone

Following introductions, Kat Bukowy (HNTB) stated that the purpose of the meeting was to discuss the 30 percent hydraulic plans for the I-4700 portion of the project. She noted that while the project limits are from US 25 south of Hendersonville to I-40/I-240 south of Asheville, the design limits terminate at approximately NC 191 (Brevard Road). I-4700 will tie into other projects, like I-5504, the reconstruction of the NC 191 (Brevard Road) interchange and will only include resurfacing and striping.

Marla Chambers (NCWRC) voiced her concerns regarding wildlife crossings on I-26. Kat noted the numerous culverts and bridges along the project that are likely used by animals to cross the road. In addition, this project will widen largely to the median and, as Marella Buncick (USFWS) also pointed out, the forested areas along the sides of the interstate will largely remain undisturbed. Kat stated that only 6 percent of the total crashes between July 1, 2009 and June 31, 2012 were attributable to deer. Because this project is a widening and not on new location it is not expected to have a substantial impact on wildlife travel patterns.

Marla and Marella both expressed their concerns for water quality impacts to the French Broad River as a result of increased stormwater from the additional impervious surface created by the widening. Kat and Matt Foster (HNTB) mentioned the commitments made in the Biological Assessment to use Design Standards in Sensitive Watersheds (DSSW) for any stream directly connecting to the French Broad River. These streams are also designated as Environmentally Sensitive Areas (requiring a 50-foot buffer from construction) according to NCDOT policy. In addition, NCDOT Hydraulics unit has committed to looking at innovative ways to treat post-construction stormwater discharges. It was agreed that it would be optimal for the hydraulics and stormwater plans to be coordinated from this point forward.

Aaron Castro (HNTB) then led the group through the plan sheets of the proposed hydraulic design for each jurisdictional stream and wetland. Comments on particular streams or wetlands were:

Sheet 8 (Sta. No. 889 (EB)) Stream SDC – Flows directly to the French Broad River; is approximately 4 feet from a house, needs bank stabilization; USFWS asked if there was an opportunity for stream mitigation? USACE and NCDWR indicated no, but it may be on opportunity to stabilize the bank with plantings.

Sheet 10 (Sta. No. 914 (WB)) Stream SDE – Aaron noted that this is a FEMA crossing and that during storm events water flows down Glen Bridge Road instead of through the pipe under the road. The plan is to connect all of the pipes and direct flow through the pipes and into the stream channel. Stormwater will be discharged to a headwall/wingwall.

Sheet 11 (Sta. No. 932 (WB and EB)) Stream SDF – Aaron noted that the pipe for this stream will be collared and extended. Marella asked if the stream is currently perched. Aaron noted that it is at the outlet end.

Sheet 12 (Sta. No. 938 (WB)) Stream SDG – Marella noted that something may need to be done to accommodate additional flow. Lori Beckwith (USACE) noted that this stream may have an indirect effect on wetland WBR (EB). It was also noted that scour pads may be used to redirect the flow. Concern expressed as to whether or not the scour pads would cause erosion. It was suggested that this site be looked at in the field.

Sheet 13 (Sta. No. 952 – 964) – USACE asked about major structures from CP2A meeting. HNTB will send out the summary from CP2A (attached) and will look at the perched stream in this area.

Sheet 14 (Sta. No. 973) – The pipe at this location would be 24 inches. It was suggested that it be armored for stormwater.

Sheet 15 (Sta. No. 984) – Label bank stabilization and include on the summary sheet.

Sheet 18 (Sta. No. 1027) – Stream SDU will have rip rap on banks. May need protection if there is additional flow from toe protection. The same was noted on the outlet side of the pipe. It was noted that there is scour around the pipe and it should be filled in with rip rap.

Sheet 18 – 20 (Sta. No. 1029 – 1052) – Wetland WCH (Biltmore Bog) – questions were raised as to why widening is toward the bog rather than away from it. Request to look at each location of where the impacts are and to minimize further if possible.

Sheet 20 (Sta. No. 1043) – Question asked as to where the bore pit will be located for the pipe at this location.

Sheet 23 (Sta. No. 1083) – Will need to explain that the cut slope in this area will be filled, the Intermittent portion of Stream SDX will be moved into a ditch and will then tie to the Perennial portion of the stream. HNTB will add 3 outlet protections on the bank. Look for ways to lessen the amount of flow into SDX, be as creative as possible to avoid erosion.

Sheet 24 (Sta. No. 1105) – Although there is an outfall pipe to this wetland (WCU), no impacts are shown.

Lori asked if streams piped during construction would be included on plans. Randy McKinney (NCDOT – Division 13) stated that they would be included in the contractor's plans.

Lori noted that submitting the permit application for this project between mid and late December would likely cause a delay in review due to the holidays.

Action Items:

- HNTB will provide a summary sheet of impacts

- HNTB will determine if wetland WEL will be dewatered as a result of temporarily piping stream SFO.
- Lori will forward an email she sent to Dre Major with her concerns at CP2A for HNTB to review and address.
- NCDOT Location and Surveys will revise the FS file to remove extraneous "JS" labeled streams.
- HNTB will revise the plan sheets so that only jurisdictional streams are labeled JS.

Follow up on Action Items from August 14, 2018 meeting:

- NCDOT directed HNTB not to provide a summary of impacts because the hydraulic design has not been approved.
- Wetland WEL is above stream SFO and therefore cannot be dewatered when SFO is temporarily piped.
- NCDOT Location and Surveys revised the FS file to remove the extraneous streams and HNTB has revised the plan sheets to only show jurisdictional streams with the label JS. In addition, HNTB has labeled each stream and wetland with its ID from the NRTR.
- Lori forwarded the email she sent to Dre Major with her concerns at CP2A. HNTB has reviewed the email and offers the following:

  Site 7 – This is located in I-4400A and will be addressed when that project moves forward.

  Site 12 – This is part of I-4400BB. The confluence of the two incoming streams at the upstream end of this culvert will be addressed during hydraulic design for this segment of the project.

  Site 17 – This triple cell, 7' x 7' reinforced concrete box culvert (RCBC) is part of I-4400C. The addition of sill in 1 barrel or a floodplain bench constructed in the right bank will be investigated as part of the hydraulic design of this segment.

  Site 23 – This dual-cell, 10'x10' RCBC is part of I-4700A. The addition of a sill in one barrel or a floodplain bench will be investigated to address over-widening in this culvert.

  Site 24 – This single cell, 8'x8' RCBC is part of I-4700A. However, there are no plans for any improvements to the structure or any areas upstream or downstream of the culvert. The RCBC will simply be retained.

Because the August 14th meeting did not complete the 30 percent hydraulic review for I-4700, the meeting was continued on September 19, 2018.

Meeting Date: September 19, 2018

Time: 1:00 p.m. to 5:00 p.m.

Place: NCDOT Division 13 Conference Room, 55 Orange St, Asheville

Project: I-26 Widening in Henderson and Buncombe Counties, Federal Aid Project No. NHF-26-1(62)23/IMNHF-026-1(86)9, WBS No. 34232.1.1/36030.1.1, STIP Project Nos. I-4400/I-4700, NCDOT Divisions 13 and 14

Purpose: Achieve Merger Team concurrence on Concurrence Point (CP) 4B, 30 Percent Hydraulic Review, for I-4700 A and B

Meeting Attendees:

Name	Agency	Email address	Phone
Felix Davila*	FHWA	felix.davila@dot.gov	919-747-7021
Loretta Beckwith	USACE	loretta.a.beckwith@usace.army.mil	828-271-7980 x223
Marella Buncick	USFWS	marella_buncick@fws.gov	828-258-3939 x237
Lyuba Zuyeva	French Broad River MPO/Land of Sky	lyuba@landofsky.org	828-251-7454
Kevin Barnett	NCDEQ DWR	kevin.barnett@ncdenr.gov	828-296-4657
Marla Chambers*	NCWRC	marla.chambers@ncwildlife.org	704-984-1070
Roger Bryan	NCDOT – Division 13	rdbryan@ncdot.gov	828-251-6171 x221
Randy McKinney	NCDOT – Division 13	rmckinney@ncdot.gov	828-298-0080
Ted Adams*	NCDOT – Division 14	tadams@ncdot.gov	828-631-1155
David McHenry*	NCDOT – Division 14	dgmchenry@ncdot.gov	828-586-4043
Mitchell Bishop	NCDOT – Division 14	jmbishop@ncdot.gov	828-586-2144
Richard Hensley	NCDOT – L&S Region III	rhensley@ncdot.gov	828-667-9616
Steve Gosnell	NCDOT – L&S Div 13	sgosnell@ncdot.gov	828-667-9616
Carla Dagnino*	NCDOT – Natural Environment Section	cdagnino@ncdot.gov	919-707-6110
Jennifer Martin*	NCDOT – PMU	jdmartin4@ncdot.gov	919-707-6050
Craig Lee	NCDOT – Hydraulics	cjlee@ncdot.gov	919-707-6708
Randy Henegar	TGS Engineers	rhenegar@tgsengineers.com	919-773-8887 x114
Kat Bukowy	HNTB	kbukowy@hntb.com	919-424-0441
Matt Foster	HNTB	mfoster@hntb.com	919-424-0460
Aaron Castro	HNTB	acastro@hntb.com	816-527-2492
Jeff Hess	HNTB	jhess@hntb.com	704-208-5363
Joe Olson	HNTB	jsolson@hntb.com	919-424-0480

*attended by phone

Kat Bukowy opened the meeting with introductions. Matt Foster (HNTB) began the meeting by reviewing the purpose of the meeting and the agenda. Matt noted that there are 61 proposed outfalls, but he has not tabulated the existing number.

Marella asked if stream SDX could be monitored through construction as part of the commitments to monitoring in the BA. This monitoring would be similar to the monitoring of Long Branch on the US 19 project. Her biggest concern for the project is what will change. Kat explained that NCDOT is partnering with USGS to monitor streams before, during, and after construction, in addition to the geomorphology study of the French Broad River. HNTB will ask if additional streams can also be monitored.

Lori asked about the sills and baffles previously mentioned on the major structures. These were discussed further at the end of the meeting.

Matt then led the group through the proposed hydraulic design beginning with Sheet 28.

Sheet 28 – Stream SEF turns and flows into wetland WDA prior to the beginning of SEE. Location and Surveys will fix this on the FS file. Matt Foster noted that a team had been in the field and inspected the pipe that carries stream SEE under Old River Road on Biltmore Estate and outfalls into the French Broad River. Craig Lee (NCDOT) noted that a pre- and post-construction evaluation would need to be conducted to determine if the pipe is appropriately sized. Marella noted this stream should also be monitored and proposed doing so on the edge of NCDOT right of way and then somewhere past the erosion control. Randy McKinney (NCDOT) suggested that it may be prudent to pay Biltmore Estate to replace the pipe, assuming it needs to be replaced. Kevin Barnett (NCDWR) noted that monitoring needs to be conducted both upstream and downstream before, during, and after construction and also immediately after storms to provide value.

Kevin also noted that two of the pipes on Sheet 28 appear to be directly discharging into surface waters. Randy Henegar (TGS Engineers) stated that this was to mitigate the velocity. Kevin disagreed. Craig noted that the plans show an outlet to rip rap and that existing pipes currently outfall directly to the stream and that this will be addressed at every opportunity. Kevin noted that it is standard language in the 401 permit and that the application will need to point out where the pipe outfall directly to surface waters cannot be avoided and why. Every location needs to separate out and show where water treatment is being provided.

Matt noted that energy dissipaters could be used on pipe outlets to reduce the velocity of the water. Marella noted that because all of the discharge is stormwater it needs to be a lower velocity when arriving at the stream for stability. Lori asked if the dissipaters will be in the stream. Craig stated that the dissipater would be attached to the outlet of the pipe outside the top of bank and any rip rap beyond the energy dissipater would be embedded in the stream and streambank to provide stabilization and would not restrict the flow of the stream.

Marla noted that stream SEE currently flows into a concrete box and that there is no passage potential for this stream. She asked if the stream could be reestablished by redoing the inlet to the previous channel and allowing passage. Craig noted that in the final design there would be two pipes to also pick up water from behind the retaining wall, which would prevent reestablishing the stream channel.

Sheet 29 – Kat noted where stream SFG would be temporarily piped during construction. Marella requested monitoring of this stream. Stream SFO would also be temporarily piped with a spring box. Marella requested monitoring of stream SFO and SFH during construction and when the streams are restored. Kevin stated that for compliance, stream SFO would need to be monitored before its confluence with SFH.

Matt noted that the pipe at approximately Station 1166 may “buck grade” to outfall at 2904. The pipe at 2901 with outfall to SFG would not exist and flow would instead be sent to 2903, then to 2904. This would reduce impacts to stream SFG and would provide and outlet that would allow for some level of stormwater treatment before entering the French Broad River.

Roger Bryan noted that a recent television news article had announced the sale of the property in the northwest quadrant of the I-26 bridge and French Broad River. Streams SFH and SFO and wetland WEA and WEL are located on this property.

In addition, any "retain" labels for pipes outside of the right of way will be deleted (e.g. 36" CMP for SFH-P).

Sheet 30 – No comments.

Sheet 31 – Marella requested monitoring on SFG near station 1197, as well as additional points prior to its outfall at the river. There is opportunity for treatment at the outfall of 3111. The rip rap at outfall of 60" welded steel pipe (3122) needs to be shown. Bore pits in this area will be challenging. A temporary pipe for SFG-P will likely need to be added to set bore equipment on the pipe.

Sheet 32 – Meeting proposed with Matt Lauffer, Craig, Randy H, Matt F, and Mark Staley regarding the monitoring of stream SFG, which is on Biltmore Estate property in addition to other monitoring locations.

Randy M noted his preference for using flowable fill for all pipes, rather than removing them.

There were no comments on Sheets 33 and 34.

Matt returned to Lori's request for sills and baffles. Of the five sites listed (see page 4), only two are in I-4700, Sites 23 and 24.

Site 23 is on Sheet 15, the 10x10' RCBC that carries Powell Creek (SDN) will be extended. Rip Rap can be used to restrict the low flow to one barrel and will allow a floodplain bench to be established naturally over time.

Site 24 is on Sheet 18, the 8x8' RCBC that carries Ducker Creek (SDT) may be extended to accommodate ramp widening. If so, the perch will be corrected when it is extended.

Finally, Marla noted that the structures being replaced on I-26 should be animal passage friendly. The control of access fencing at the bridge over Biltmore Farms access road should direct animals under the bridge and not across the highway.

The following are action items from the meeting:

- HNTB will work with Location and Surveys to correct the FS file.
- CP4C – Permit Drawing Review will be held October 10, 2018. This meeting was postponed.
- HNTB will insure that all cut and fill lines along with outlet protection symbols are shown on the final plans.

I-26 Widening

STIP Project Nos. I-4400/I-4700

Section 404/NEPA Merger Meeting

Concurrence Point 4C

November 20, 2018

US 25 (exit 54) in Henderson County to I-40/I-240 in Buncombe County including the Blue Ridge Parkway Bridge over I-26

DRAFT

Meeting Date: November 20, 2018
Time: 8:00 a.m. to 12:00 p.m.
Place: NCDOT Division 13, HQ Conference Room, 55 Orange St, Asheville

Meeting Attendees:

Name	Agency	Email address	Phone
Loretta Beckwith	USACE	loretta.a.beckwith@usace.army.mil	828-271-7980 x4223
Marella Buncick	USFWS	marella_buncick@fws.gov	828-258-3939 x237
Claire Ellwanger	USFWS	Claire_ellwanger@fws.gov	828-258-3939
Kevin Barnett*	NCDEQ DWR	kevin.barnett@ncdenr.gov	828-296-4657
Marla Chambers	NCWRC	marla.chambers@ncwildlife.org	704-984-1070
Lyuba Zuyeva	French Broad River MPO/Land of Sky	lyuba@landofsky.org	828-251-7454
Bill Barrett	NCDOT – EAU, ECAP	wabarrett@ncdot.gov	919-707-6103
Michael Turchy	NCDOT – EAU, ECAP	maturchy@ncdot.gov	919-707-6157
Carla Dagnino*	NCDOT – EAU, ECAP	cdagnino@ncdot.gov	919-707-6110
Matt Lauffer	NCDOT – Hydraulics	mslauffer@ncdot.gov	919-707-6703
Craig Lee*	NCDOT – Hydraulics	cjlee@ncdot.gov	919-707-6708
Jeremy Goodwin*	NCDOT – REU	jagoodwin@ncdot.gov	919-707-2942
Randy McKinney	NCDOT – Division 13	rmckinney@ncdot.gov	828-298-0080
Brendan Merithew	NCDOT – Division 13	bwmerithew@ncdot.gov	828-251-6171
Roger Bryan	NCDOT – Division 13	rdbryan@ncdot.gov	828-251-6171
Yates Allen	NCDOT – Division 13	ryallen@ncdot.gov	828-251-6171
Ted Adams	NCDOT – Division 14	tadams@ncdot.gov	828-631-1155
Wanda Austin	NCDOT – Division 14	whaustin@ncdot.gov	828-631-1148
Josh Deyton	NCDOT – Division 14	jbdeyton@ncdot.gov	828-631-1201
Mitchell Bishop	NCDOT – Division 14	jmbishop@ncdot.gov	828-631-1143
Randy Henegar	TGS Engineers	rhenegar@tgsengineers.com	919-773-8887 x114
Kat Bukowy	HNTB	kbukowy@hntb.com	919-424-0441
Matt Foster	HNTB	mfoster@hntb.com	919-424-0460
Natalie Chan	HNTB	mchan@hntb.com	919-424-0493
John Blancett*	HNTB	jblancett@hntb.com	826-527-2539

Those who participated by phone are marked with an asterisk (*).

Kat Bukowy (HNTB) began the meeting with introductions, a brief review of the project, the purpose of the meeting, and the anticipated agenda for the meeting. Matt Foster (HNTB) began with a review of the Avoidance and Minimization Measures taken to date. Lori Beckwith (USACE) asked about rip rap in shown in the streams. Matt F stated that rip rap is to be embedded in the stream. Roger Bryan (NCDOT) and Yates Allen (NCDOT – Division 13) noted that material, such as rock, sand, or core fiber could be added to allow the rip rap to silt in more quickly. Roger also noted that where there were scour holes they would be filled with rock, then fabric, and then other materials to allow them to silt in as quickly as possible.

Matt F. reviewed the different types of impacts that were noted in the plans including stream relocation, channel change, pipe, and bank stabilization. Lori noted that stream relocations are considered a full take. Channeling a stream to rip rap is different than a stream relocation.

Matt F. also noted that NCDOT will be using energy dissipaters on many of the stormwater pipes to reduce the velocity of the water before it outlets into a stream or wetland. Marla Chambers (NCWRC) asked if it would be enough to have the energy dissipaters at the ends of the pipes. Matt Lauffer (NCDOT – Hydraulics) noted that in addition to the energy dissipater there would be approximately 5 feet of rip rap at the end of the pipe to further reduce velocity between the energy dissipater and the stream.

Matt F. then began a review of the impacts to the jurisdictional waters. The following is a list of sites that were discussed in further detail.

Site 4 – Matt F. explained the current flooding problems at this location and the need for an additional 66” pipe. Marella asked if NCDOT has accounted for the dissipation considering that these pipes will be smooth steel. Later in the meeting Matt L. explained that there is very little calculable difference between the use of steel v. concrete.

Site 6 –Roger noted that the current 66” CMP would not be able to hold the new conveyance. Permanent rip rap was proposed at the outlet; however, this site flows to a 45” arched pipe under a private drive. Matt L. noted that NCDOT could not add conveyance. Matt F. noted that Glenn Bridge Road is currently overtopped diverting water down the existing road which then flows back to the same outlet location. The supplemental pipe was added to decrease the flooding along Glenn Bridge Road without adding additional drainage area to the outfall. Craig Lee (NCDOT – Hydraulics) noted that this site would need to be reevaluated. Randy Henegar (TGS Engineers) and Craig Lee noted that the overall plan sheet and the detail were inconsistent and the stream protection is shown differently, one shows it in-channel and one on the banks.

Sites 7, 8, and 9 – the supplemental pipe shown on Permit Drawing Sheet (PDS) 17 and 18 needs to be included on the detail PDS 19 and 20. Roger noted that the supplemental pipes would be 1 foot higher than the retained pipes.

Site 11 – Lori asked how wetland WBV would not be dewatered. Matt L. noted that the supplemental pipe was added for high flow events. Matt F. stated that the existing pipe to the wetland would be lined and retained and the rip rap at the outlet was added to prevent scour.

Craig asked if Division 13 was ok with the addition of the energy dissipaters and was there enough room to construct them because no additional hatching is shown and therefore the dissipaters would need to be built from the slope. Randy Henegar (TGS Engineers) noted that there should be enough room to place the energy dissipaters between the fill slope and the stream.

Site 18A – Randy McKinney (NCDOT – Division 13) requested that the largest rock size be used when protecting the wing walls.

Site 18A – Marella Buncick (USFWS) expressed concern about the conservation easement area at the inlet end of Site 18A. No impacts at this end and therefore a non-issue.

Site 19 – Marla Chambers (NCWRC) asked if the minor impacts at this site, which is at wetland WCH (also known as the Biltmore Bog), could be avoided. Minimization has occurred to the maximum extent practicable, primarily slopes have been steepened to 1.5:1 or 2:1.

Site 20 – Matt F. noted that this site is unusual because the stream will be more in line with the proposed pipe, which will be buried deeper than the existing pipe. The proposed pipe will then become the primary pipe and the existing pipe will become the supplemental pipe during high flow events. Marla asked if NCDOT would need to fill the existing to a bench. Roger stated that if NCDOT needs to fill more than proposed, it will be assessed in the field.

Site 21 and 22 – Marla asked about wildlife being able to use the road passing underneath the I-26 bridge. This road is currently a road on private property, Biltmore Farms. There is a gate/fencing put up by the landowner. NCDOT control-of-access fencing will tie into the bridge abutments.

Site 29 – NCDOT requested that coir fiber matting and wattles be used, instead of PRSM. Matt F. noted that the coir fiber matting can be used in many locations, however on steep slopes Class I or II rip rap would be used in lieu of PRSM if it meets the guidelines for shear stress.

Site 28 –This site to be revised to add a channel change in addition to temporary impacts.

Jeremy Goodwin (NCDOT – REU) asked what the temporary clearing would be. Natalie Chan (HNTB) responded that it was Method II or hand clearing. Jeremy noted that a strip of 10 feet needed to be added at the toe of slope. NCDOT agreed that 10 feet or to the right of way line would be shown for temporary impacts. Lori noted that the type of temporary impact (e.g. compaction) should be noted as well as the restoration method. Restoration would need to be monitored for 5 to 7 years. It was agreed that Sites 11, 19, 22, and 32 would be reviewed. In further discussions with NCDOT, at wetland areas a strip up to 12'wide or to the right of way line would be shown as mechanized clearing and reseeded after construction. These additional impacts will be added to the permit plans and the summary tables

PDS 63, pipe profile – Marla asked if the pipe was suitable for fish passage. Roger noted that fish were unable to pass now and would not be able to in the future. Photos of this stream were shown.

Site 34 – Needs to be reviewed. After further review, the pipe extension will be rotated to fit the existing stream and reduce the impact of stream relocation

Site 37 – Lori asked that NCDOT make sure the proposed design not dewater wetland WCZ. NCDOT noted that some check dams could be added. The FS file and the WET file need to be correlated to determine the end point of Stream SEF.

Site 39 – The inlet needs to be stubbed out into the stream. Surface drainage needs to be addressed. An inlet pipe or a berm ditch outlet will be evaluated to intercept the surface drainage.

Site 43 – Show all of wetland WDZ on the plan set.

PDS 90 – Address a non-JS pipe and lateral ditch. A junction box and outlet pipe along with a short section of ditch will be added to direct flow to a non-jurisdictional water.

Site 47 – Concern raised that the temporary impacts may dewater the wetland adjacent to SFQ.

After the sites were reviewed the group moved to address concerns over Sediment and Erosion Control not previously discussed. Roger noted that the Erosion Control Plans are incomplete. Matt L. briefly discussed the agreements with FIMAN to monitor the before/during/after of the French Broad River, as well as additional 2D modeling of the causeways, and an agreement with USGS for geomorphological monitoring.

Roger and Randy noted that the outreach to the river businesses and organizations had been successful. Roger noted that a new business was opening for the 2019 season, Beer City Tubing. Kat noted that they would be added to the Communication Plan.

Action Items

- HNTB to address comments and update the plan set and impact summary sheets.
- Marella asked for a summary of where and which streams or wetlands have energy dissipaters. Kat will provide this information.
- Label all pipes conveying jurisdictional streams as buried or not buried.
- Update ditch details to show rip rap as keyed-in and label the natural channel bed as the top of the rip rap.
- Add Detail for toe protection for Site 1
- Evaluate downstream structure at Site 6
- Replace pipe collars with junction boxes as needed, particularly where pipes can be aligned with jurisdictional stream or in areas where the type of pipe is changing.
- Verify that the 66” pipe at Site 31 is not buried due to potential head cuts on a long steep pipe.

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

(Version 2.08; Released April 2018) FOR NCDOT PROJECTS

WBS Element: 36030.1.1 **TIP No.:** I-4700 **County(ies):** Buncombe Henderson

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:	whaustin@ncdot.gov			**Email:**	jsolson@HNTB.com		
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:**	Suburan

	Proposed Project	**Existing Site**
Project Built-Upon Area (ac.)	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:

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)					

WBS Element: 36030.1.1 **TIP No.:** I-4700 **County(ies):** Buncombe Henderson

Additional Waterbody Information

Surface Water Body (2):	SDC - 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:	SDC			**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)						

Surface Water Body (3):	SDE - 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:	SDE			**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)						

Surface Water Body (4):	SDF - 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:	SDF			**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)						

Surface Water Body (5):	SDG - 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:	SDG			**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)						

WBS Element: 36030.1.1 **TIP No.:** I-4700 **County(ies):** Buncombe Henderson

Additional Waterbody Information

Surface Water Body (6):	SFX - 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:	SFX			**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)						

Surface Water Body (7):	SDK - 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:	SDK			**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)						

Surface Water Body (8):	SDP - 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:	SDP			**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)						

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

WBS Element: 36030.1.1 **TIP No.:** I-4700 **County(ies):** Buncombe Henderson

Additional Waterbody Information

Surface Water Body (10):	SDU - 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:	SDU			**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)						

Surface Water Body (11):	SDV - 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:	SDV			**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)						

Surface Water Body (12):	SDW - 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:	SDW			**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)						

Surface Water Body (13):	SDX - 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:	SDX			**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)						

WBS Element: 36030.1.1 **TIP No.:** I-4700 **County(ies):** Buncombe Henderson

Additional Waterbody Information

Surface Water Body (14):	SDY - 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:	SDY			**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)						

Surface Water Body (15):	SEQ - 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:	SEQ			**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)						

Surface Water Body (16):	SDE - 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:	SDE			**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)						

Surface Water Body (17):	SEF - 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:	SEF			**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)						

WBS Element: 36030.1.1 **TIP No.:** I-4700 **County(ies):** Buncombe Henderson

Additional Waterbody Information

Surface Water Body (18):	SEE - 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:	SEE			**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)						

Surface Water Body (19):	SFG - UT to French Broad River		**NCDWR Stream Index No.:**	6-(54.75)		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:				
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?		Comments:				
NRTR Stream ID:	SFG			**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)						

Surface Water Body (20):	SFR - UT to French Broad River		**NCDWR Stream Index No.:**	6-(54.75)		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:				
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?		Comments:				
NRTR Stream ID:	SFR			**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)						

Surface Water Body (21):	SFQ - UT to French Broad River		**NCDWR Stream Index No.:**	6-(54.75)		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:				
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?		Comments:				
NRTR Stream ID:	SFQ			**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

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Additional Waterbody Information

Surface Water Body (22):	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:	French Broad River			**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?	Yes	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	No	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

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WBS Element: 36030.1.1 **TIP No.:** I-4700 **County(ies):** Buncombe Henderson

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

Additional Comments

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

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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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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	2530-Out -EBL-1118+13 RT 35.506762,-82.571698	(13)SDX - UT to French	Energy Dissipator			Pipe	15	1.8	2.1	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

Additional Comments

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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?
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
26	2619 -L-1134+00 RT 35.509696,-82.575657	WCW	Energy Dissipator		1.4	Pipe	24	4.8	2.2	N/A
27	2702 -L-1138+00 RT 35.510192,-82.576857	WCW	Energy Dissipator		1.4	Pipe	15	4.9	2.2	N/A
27	2752 -L- 1138+61 RT 35.51024, -82.57706	WCZ	Riprap Energy Dissipator Basin	Class I	21.4	Pipe	36	29.0	2.2	No
27	2708-Out -L- 1142+00 RT 35.51064, -82.57808		Riprap Energy Dissipator Basin	Class 'B'	1.5	Pipe	18	5.0	0.6	No
27	2714 -L- 1148+50 RT 35.511400,-82.580061	(17)SEF - UT to French	Energy Dissipator		1.3	Pipe	15	4.1	2.2	N/A
28	2802-Out -L- 1151+50 RT 35.51179, -82.58095	(17)SEF - UT to French	Riprap Energy Dissipator Basin	Class 'B'	1.1	Pipe	15	5.0	1.0	No
28	2822-Out -L- 1153+62 RT 35.51204, -82.58159	(17)SEF - UT to French	Riprap Energy Dissipator Basin	Class 'B'	10.7	Pipe	24	17.0	1.6	No
28	2808 -L- 1155+50 RT 35.512192,-82.582206		Energy Dissipator		1.4	Pipe	15	6.7	2.4	N/A
28	2815 -L- 1157+33 RT 35.512503,-82.582705	(18)SEE - UT to French	Energy Dissipator		7.6	Pipe	30	22.8	3.5	N/A
29	2904-Out -L- 1166+37 LT 35.51302, -82.58577		Riprap Energy Dissipator Basin	Class 'B'	2.5	Pipe	15	11.2	1.7	No
29	2912OUT -L- 1173+00 RT 35.514413,-82.587333	(19)SFG - UT to Dellwood	Energy Dissipator		1.4	Pipe	15	6.3	2.4	N/A
30	3001-Out -L- 1176+94 RT 35.51508, -82.58828		Riprap Energy Dissipator Basin	Class 'B'	0.7	Pipe	15	2.3	1.5	No
30	3005-Out -L- 1178+90 RT 35.51549, -82.58866		Riprap Energy Dissipator Basin	Class 'B'	1.6	Pipe	24	2.5	1.3	No

Additional Comments

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

7/24/2017

TIP PROJECT: I-4700

CONTRACT:

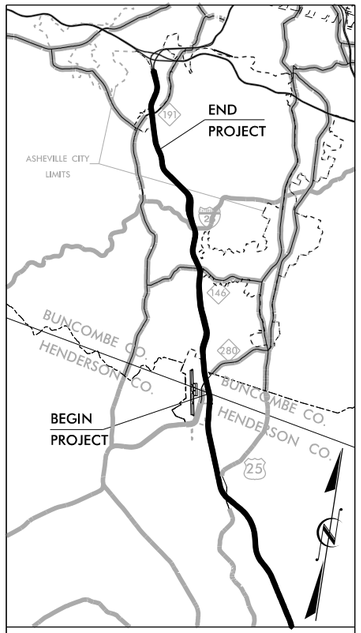
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BUNCOMBE & HENDERSON COUNTIES

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(R/W/UTIL)
TBD	TBD	I-4700B(R/W/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

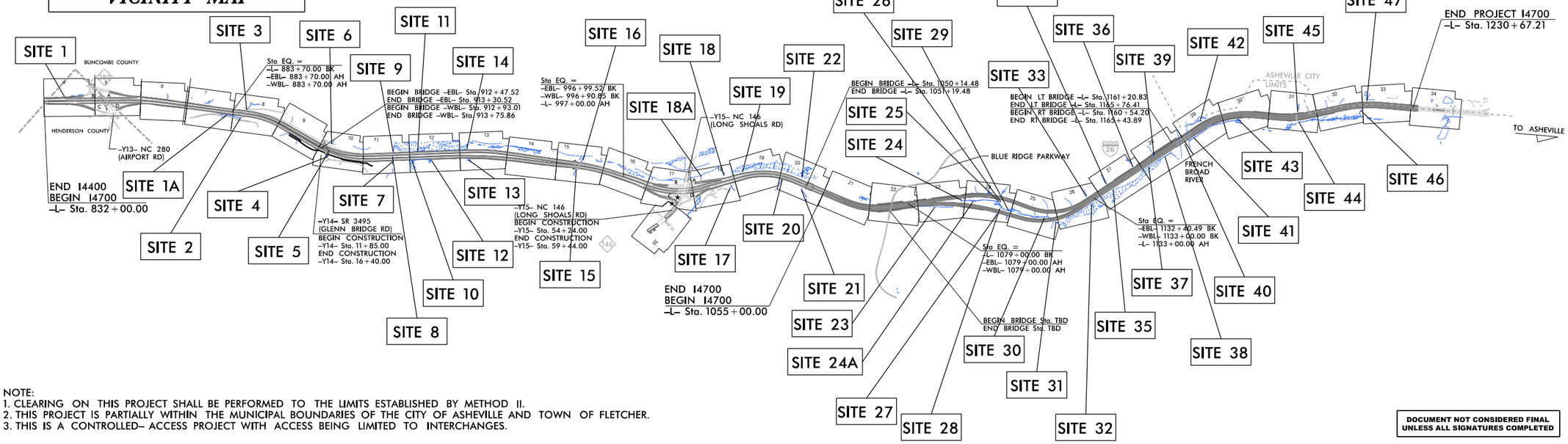


VICINITY MAP

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



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

GRAPHIC SCALES

PLANS: 50 25 0 50 100

PROFILE (HORIZONTAL): 50 25 0 50 100

PROFILE (VERTICAL): 10 5 0 10 20

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.

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

11/29/2018
...\Drawings\I4700A_HYD_PRM_TSH
HNTB

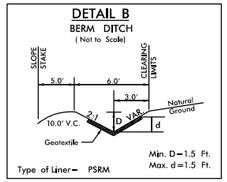
DRAINAGE DITCH DETAILS

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No. C-1554

I-4700	2D-2
R/W SHEET NO.	
	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 2 OF 97

DETAIL B
BERM DITCH
(Not to Scale)

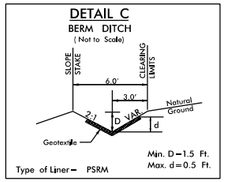


Min. D=1.5 Ft.
Max. d=1.5 Ft.

Type of Liner= PSRM

FROM –L– STA. 833+50 TO STA. 835+25 RT
FROM –L– STA. 835+75 TO STA. 837+83 RT
FROM –WBL– STA. 889+14 TO STA. 891+50 RT
FROM –WBL– STA. 896+25 TO STA. 901+50 RT.
FROM –WBL– STA. 924+50 TO STA. 931+25 RT
FROM –WBL– STA. 989+00 TO STA. 991+25 RT
FROM –WBL– STA. 994+35 TO STA. 994+95 RT
FROM –WBL– STA. 996+00 TO –Y15RPC– STA. 10+60 RT
FROM –L– STA. 997+00 TO STA. 1000+28 RT

DETAIL C
BERM DITCH
(Not to Scale)

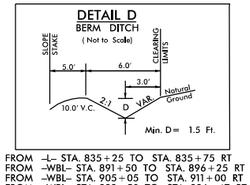


Min. D=1.5 Ft.
Max. d=0.5 Ft.

Type of Liner= PSRM

FROM –L– STA. 1063+50 TO STA. 1066+75 RT.

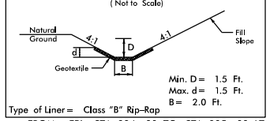
DETAIL D
BERM DITCH
(Not to Scale)



Min. D= 1.5 Ft.

FROM –L– STA. 835+25 TO STA. 835+75 RT
FROM –WBL– STA. 891+50 TO STA. 896+25 RT
FROM –WBL– STA. 905+05 TO STA. 911+00 RT
FROM –WBL– STA. 932+50 TO STA. 936+47 RT
FROM –WBL– STA. 991+25 TO STA. 994+35 RT
FROM –WBL– STA. 994+95 TO STA. 996+00 RT
FROM –L– STA. 1031+50 TO 1042+25 STA. RT
FROM –WBL– STA. 1108+25 TO STA. 1110+50 RT
FROM –EBL– STA. 1114+51 TO STA. 1119+00 LT.
FROM –L– STA. 1217+75 TO STA. 1230+57.72 LT.

DETAIL E
SPECIAL LATERAL BASE DITCH
(Not to Scale)

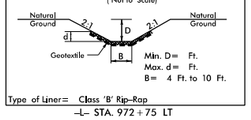


Min. D= 1.5 Ft.
Max. d= 1.5 Ft.
B= 2.0 Ft.

Type of Liner= Class "B" Rip-Rap

FROM –EBL– STA. 884+00 TO STA. 885+00 LT
FROM –WBL– STA. 902+00 TO STA. 903+25 RT

DETAIL F
STANDARD BASE DITCH
(Not to Scale)

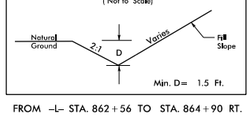


Min. D= Ft.
Max. d= Ft.
B= 4 Ft. to 10 Ft.

Type of Liner= Class 'B' Rip-Rap

–L– STA. 972+75 LT

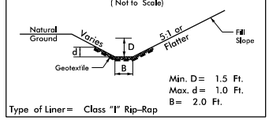
DETAIL G
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D= 1.5 Ft.

FROM –L– STA. 862+56 TO STA. 864+90 RT.

DETAIL H
SPECIAL LATERAL BASE DITCH
(Not to Scale)

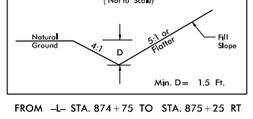


Min. D= 1.5 Ft.
Max. d= 1.0 Ft.
B= 2.0 Ft.

Type of Liner= Class "I" Rip-Rap

FROM –L– STA. 873+50 TO STA. 874+25 RT
FROM –Y15PRC– STA. 10+00 TO STA. 11+95 RT

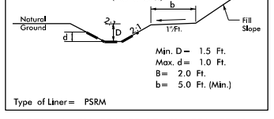
DETAIL I
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D= 1.5 Ft.

FROM –L– STA. 874+75 TO STA. 875+25 RT

DETAIL J
LATERAL BASE DITCH
(Not to Scale)

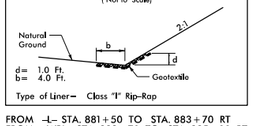


Min. D= 1.5 Ft.
Max. d= 1.0 Ft.
B= 2.0 Ft.
b= 5.0 Ft. (Min.)

Type of Liner= PSRM

FROM –L– STA. 874+75 TO STA. 876+75 LT

DETAIL K
TOE PROTECTION
(Not to Scale)

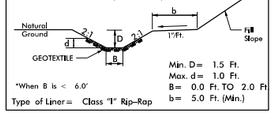


d= 1.0 Ft.
b= 4.0 Ft.

Type of Liner= Class "I" Rip-Rap

FROM –L– STA. 881+50 TO STA. 883+70 RT
FROM –WBL– STA. 883+70 TO STA. 885+00 RT
FROM –WBL– STA. 885+00 TO STA. 886+00 RT

DETAIL L
VAR. WIDTH LATERAL BASE DITCH
(Not to Scale)



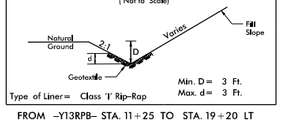
Min. D= 1.5 Ft.
Max. d= 1.0 Ft.
B= 0.0 Ft. TO 2.0 Ft.
b= 5.0 Ft. (Min.)

*When B is < 6.0'

Type of Liner= Class "I" Rip-Rap

FROM –EBL– STA. 885+00 to 888+50 LT
FROM –WBL– STA. 942+75 TO STA. 943+75 RT

DETAIL M
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

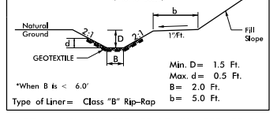


Min. D= 3 Ft.
Max. d= 3 Ft.

Type of Liner= Class 'I' Rip-Rap

FROM –Y13RPB– STA. 11+25 TO STA. 19+20 LT

DETAIL N
LATERAL BASE DITCH
(Not to Scale)



Min. D= 1.5 Ft.
Max. d= 0.5 Ft.
B= 2.0 Ft.
b= 5.0 Ft.

*When B is < 6.0'

Type of Liner= Class "B" Rip-Rap

FROM –WBL– STA. 887+50 TO STA. 889+25 RT

DETAIL P
SPECIAL LATERAL BASE DITCH
(Not to Scale)

Min. D= 1.5 Ft.
B= 2.0 Ft.

FROM –L– STA. 832+00 TO STA. 834+93 LT
FROM –WBL– STA. 902+00 TO STA. 905+25 RT

DETAIL Q
SPECIAL LATERAL BASE DITCH
(Not to Scale)

Min. D= 1.5 Ft.
Max. d= 1.0 Ft.
B= 2.0 Ft.

Type of Liner= PSRM

FROM –WBL– STA. 901+25 TO STA. 902+00 RT

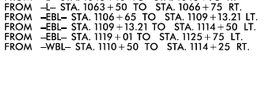
DETAIL R
LATERAL 'V' DITCH
(Not to Scale)

Min. D= 1.5 Ft.
Max. d= 1.0 Ft.
b= 5.0 Ft.

Type of Liner= Class 'B' Rip-Rap

FROM –WBL– STA. 951+50 TO STA. 953+75 RT

DETAIL S
STANDARD BASE DITCH
(Not to Scale)



Min. D= 2.0 Ft.
B= 4.0 Ft.

FROM –WBL– STA. 904+75 TO STA. 904+75 RT

DETAIL T
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

Min. D= 1.5 Ft.
Max. d= 1.0 Ft.

Type of Liner= PSRM

FROM –WBL– STA. 923+75 TO STA. 924+00 RT

DETAIL U
CONCRETE DITCH
BEHIND RETAINING WALL
(Not to Scale)

FROM –WBL– STA. 918+25 TO STA. 923+75 RT
FROM –WBL– STA. 948+75 TO STA. 951+25 RT
FROM –WBL– STA. 959+75 TO STA. 978+00 RT
FROM –L– STA. 1070+60 TO STA. 1078+00 LT.
FROM –L– STA. 1069+00 TO STA. 1079+00 RT.
FROM –EBL– STA. 1081+00 TO STA. 1084+50 LT.
FROM –EBL– STA. 1086+00 TO STA. 1093+00 LT.
FROM –WBL– STA. 1079+00 TO STA. 1081+00 RT.
FROM –WBL– STA. 1093+89 TO STA. 1100+50 RT.
FROM –L– STA. 1140+75 TO STA. 1146+58 LT.
FROM –L– STA. 1148+06 TO STA. 1161+65 LT.
FROM –L– STA. 1184+00 TO STA. 1194+92 LT.

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

Min. D= 1.5 Ft.

FROM –EBL– STA. 912+11 TO STA. 914+10 LT

DETAIL W
STANDARD BASE DITCH
(Not to Scale)

Min. D= 2.0 Ft.
B= 4.0 Ft.

FROM –EBL– STA. 1106+73 TO STA. 1106+85 RT

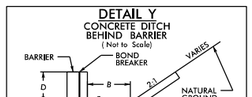
DETAIL X
SPECIAL CUT DITCH
(Not to Scale)

Min. D= 1.5 Ft.
Max. d= 1.0 Ft.

Type of Liner= PSRM

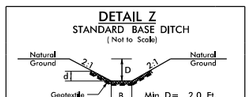
FROM –WBL– STA. 932+21 TO STA. 932+75 RT
FROM –WBL– STA. 936+25 TO STA. 937+40 RT

DETAIL Y
CONCRETE DITCH
BEHIND BARRIER
(Not to Scale)



FROM –WBL– STA. 943+75 TO STA. 948+75 RT

DETAIL Z
STANDARD BASE DITCH
(Not to Scale)



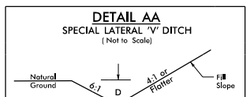
Min. D= 2.0 Ft.
Max. d= 2.0 Ft.
B= 4.0 to 6.0 Ft.

*When B is < 6.0'

Type of Liner= Class "I" Rip-Rap

FROM STA. 1094+05 TO STA. 1094+32, LT.

DETAIL AA
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D= 1.5 Ft.

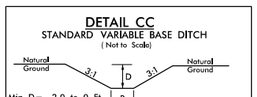
FROM –WBL– STA. 937+40 TO STA. 938+50 RT

DETAIL BB
SPECIAL CUT DITCH
(Not to Scale)

Min. D= 1.5 Ft.

FROM –Y13RPA– STA. 18+00 TO STA. 23+00 RT
FROM –WBL– STA. 937+75 TO STA. 942+75 RT

DETAIL CC
STANDARD VARIABLE BASE DITCH
(Not to Scale)



Min. D= 2.0 to 0 Ft.
B= 4.0 to 20.0 Ft.

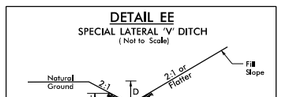
FROM –EBL– STA. 1106+85 TO STA. 1106+92 RT

DETAIL DD
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

Min. D= 1.5 Ft.

FROM –WBL– STA. 950+00 TO STA. 951+50 RT

DETAIL EE
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

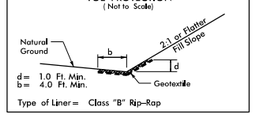


Min. D= 1.5 Ft.
Max. d= 1.0 Ft.

Type of Liner= Class 'B' Rip-Rap

FROM –WBL– STA. 1081+00 TO STA. 1081+50, RT.

DETAIL FF
TOE PROTECTION
(Not to Scale)

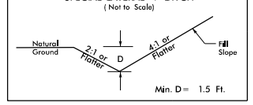


d= 1.0 Ft. Min.
b= 4.0 Ft. Min.

Type of Liner= Class "B" Rip-Rap

FROM –L– STA. 862+69 TO STA. 866+30 LT
FROM –L– STA. 866+40 TO 866+68 LT
FROM –WBL– STA. 956+00 TO STA. 959+50 RT

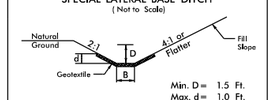
DETAIL GG
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D= 1.5 Ft.

FROM –WBL– STA. 924+25 TO STA. 924+75 RT
FROM –WBL– STA. 988+00 TO STA. 992+00 RT

DETAIL HH
SPECIAL LATERAL BASE DITCH
(Not to Scale)

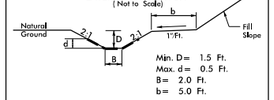


Min. D= 1.5 Ft.
Max. d= 1.0 Ft.
B= 2.0 Ft.

Type of Liner= Class "I" Rip-Rap

FROM –Y15PRC– STA. 10+00 TO STA. 11+95 RT

DETAIL JJ
LATERAL BASE DITCH
(Not to Scale)

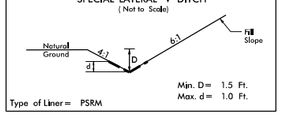


Min. D= 1.5 Ft.
Max. d= 0.5 Ft.
B= 2.0 Ft.
b= 5.0 Ft.

Type of Liner= PSRM

FROM –WBL– STA. 983+75 TO STA. 986+00 RT
FROM –L– STA. 1046+75 TO STA. 1049+00 RT
FROM –L– STA. 1060+26 TO STA. 1063+50, RT.

DETAIL KK
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

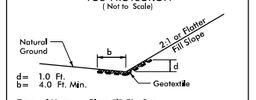


Min. D= 1.5 Ft.
Max. d= 1.0 Ft.

Type of Liner= PSRM

FROM –WBL– STA. 924+00 TO STA. 924+25 RT

DETAIL MM
TOE PROTECTION
(Not to Scale)

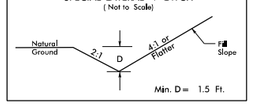


d= 1.0 Ft.
b= 4.0 Ft. Min.

Type of Liner= Class "I" Rip-Rap

FROM –Y15RPC– STA. 11+95 TO STA. 15+85 RT
FROM –L– STA. 997+00 TO 997+56 LT

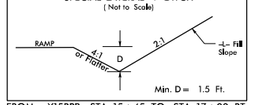
DETAIL NN
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D= 1.5 Ft.

FROM –Y15RPB– STA. 1004+22 TO STA. 1005+65 LT

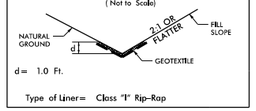
DETAIL OO
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D= 1.5 Ft.

FROM –Y15RPB– STA. 15+45 TO STA. 17+00 RT
FROM –Y15RPC– STA. 15+55 TO STA. 18+00 LT
FROM –Y15RPD– STA. 14+15 TO STA. 17+38 RT
FROM –Y15RPA– STA. 15+40 TO STA. 21+06 LT
FROM –Y15RPD– STA. 17+38 TO STA. 17+47 RT

DETAIL PP
TOE PROTECTION
(Not to Scale)

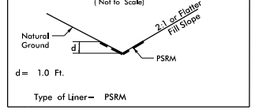


d= 1.0 Ft.

Type of Liner= Class "I" Rip-Rap

FROM –L– STA. 1027+50 TO STA. 1031+50 RT

DETAIL QQ
TOE PROTECTION
(Not to Scale)

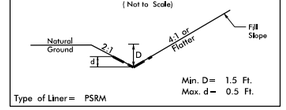


d= 1.0 Ft.

Type of Liner= PSRM

FROM –L– STA. 1026+50 TO STA. 1027+50 RT

DETAIL RR
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

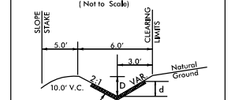


Min. D= 1.5 Ft.
Max. d= 0.5 Ft.

Type of Liner= PSRM

FROM –L– STA. 1042+25 TO STA. 1043+50 RT

DETAIL SS
BERM DITCH
(Not to Scale)

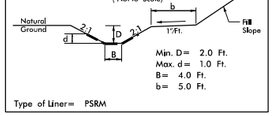


Min. D=1.5 Ft.
Max. d=0.5 Ft.

Type of Liner= PSRM

FROM –L– STA. 1043+10 TO STA. 1046+75 RT
FROM –L– STA. 1063+50 TO STA. 1066+75 RT.
FROM –EBL– STA. 1106+65 TO STA. 1109+13.21 LT.
FROM –EBL– STA. 1109+13.21 TO STA. 1114+50 LT.
FROM –EBL– STA. 1119+01 TO STA. 1125+75 LT.
FROM –WBL– STA. 1110+50 TO STA. 1114+25 RT.

DETAIL VV
LATERAL BASE DITCH
(Not to Scale)

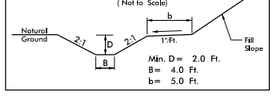


Min. D= 2.0 Ft.
Max. d= 1.0 Ft.
B= 4.0 Ft.
b= 5.0 Ft.

Type of Liner= PSRM

FROM –L– STA. 1055+50 TO STA. 1058+50 LT.

DETAIL XX
LATERAL BASE DITCH
(Not to Scale)



Min. D= 2.0 Ft.
B= 4.0 Ft.
b= 5.0 Ft.

FROM –L– STA. 1058+50 TO STA. 1061+50, LT.

8/17/99

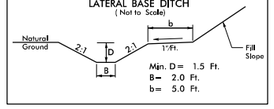
DRAINAGE DITCH DETAILS

HNTB NORTH CAROLINA, P.C.
343 Fayetteville Street, Suite 200
Raleigh, North Carolina 27601
NC License No. C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	2D-2
R/W SHEET NO.	
	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 2A OF 97

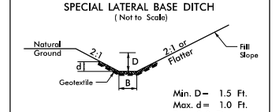
DETAIL YY
LATERAL BASE DITCH (Not to Scale)



Min. D= 1.5 Ft.
B= 2.0 Ft.
b= 5.0 Ft.

FROM –WBL– STA. 911+00 TO STA. 913+75 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.

DETAIL ZZ
SPECIAL LATERAL BASE DITCH (Not to Scale)

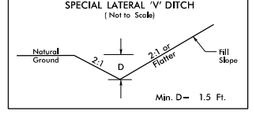


Min. D= 1.5 Ft.
Max. d= 1.0 Ft.
B= 2.0 Ft.

Type of Liner= Class 'B' Rip–Rap

FROM –L– STA. 1066+76 TO STA. 1067+75, RT.

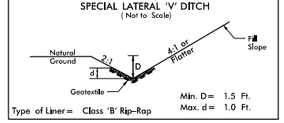
DETAIL AAA
SPECIAL LATERAL 'V' DITCH (Not to Scale)



Min. D= 1.5 Ft.

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

DETAIL BBB
SPECIAL LATERAL 'V' DITCH (Not to Scale)

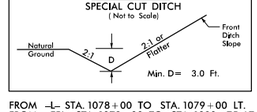


Min. D= 1.5 Ft.
Max. d= 1.0 Ft.

Type of Liner= Class 'B' Rip–Rap

FROM –L– STA. 1067+75 TO STA. 1069+00 RT.

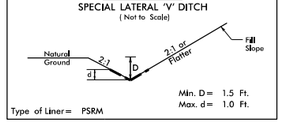
DETAIL CCC
SPECIAL CUT DITCH (Not to Scale)



Min. D= 3.0 Ft.

FROM –L– STA. 1078+00 TO STA. 1079+00 LT.
FROM –EBL– STA. 1079+00 TO STA. 1080+75 LT.

DETAIL DDD
SPECIAL LATERAL 'V' DITCH (Not to Scale)

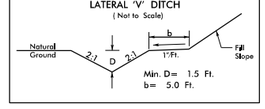


Min. D= 1.5 Ft.
Max. d= 1.0 Ft.

Type of Liner= PSRM

FROM –WBL– STA. 1118+00 TO STA. 1121+00 RT.
FROM –L– STA. 1183+00 TO STA. 1183+50 RT.

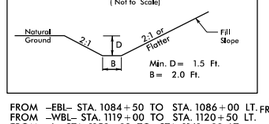
DETAIL EEE
LATERAL 'V' DITCH (Not to Scale)



Min. D= 1.5 Ft.
b= 5.0 Ft.

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

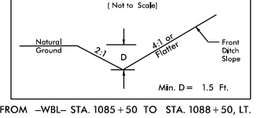
DETAIL FFF
SPECIAL LATERAL BASE DITCH (Not to Scale)



Min. D= 1.5 Ft.
B= 2.0 Ft.

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.

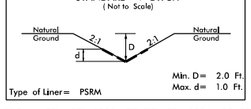
DETAIL GGG
SPECIAL CUT DITCH (Not to Scale)



Min. D= 1.5 Ft.

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

DETAIL HHH
STANDARD 'V' DITCH (Not to Scale)

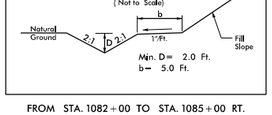


Min. D= 2.0 Ft.
Max. d= 1.0 Ft.

Type of Liner= PSRM

FROM –EBL– STA. 1093+75 TO STA. 1094+25 RT.
FROM –WBL– STA. 1102+75 TO STA. 1103+70 LT.
–EBL– STA. 1118+01 RT.

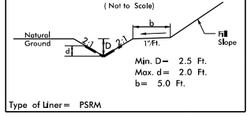
DETAIL III
LATERAL BASE DITCH (Not to Scale)



Min. D= 2.0 Ft.
b= 5.0 Ft.

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

DETAIL JJJ
LATERAL 'V' DITCH (Not to Scale)

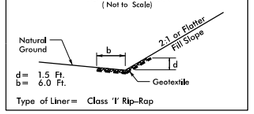


Min. D= 2.5 Ft.
Max. d= 2.0 Ft.
b= 5.0 Ft.

Type of Liner= PSRM

FROM –WBL– STA. 1082+50 TO STA. 1085+30 RT.

DETAIL LLL
TOE PROTECTION (Not to Scale)

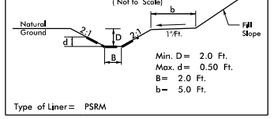


d= 1.5 Ft.
b= 6.0 Ft.

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+50 TO STA. 1104+30 RT.
FROM –WBL– STA. 1118+00 STA. TO STA. 1121+00, RT.

DETAIL MMM
LATERAL BASE DITCH (Not to Scale)

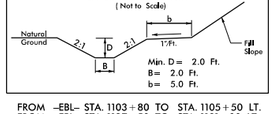


Min. D= 2.0 Ft.
Max. d= 0.50 Ft.
B= 2.0 Ft.
b= 5.0 Ft.

Type of Liner= PSRM

FROM –EBL– STA. 1105+51 TO STA. 1106+65 LT.

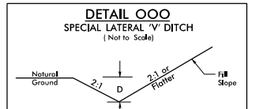
DETAIL NNN
LATERAL BASE DITCH (Not to Scale)



Min. D= 2.0 Ft.
B= 2.0 Ft.
b= 5.0 Ft.

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

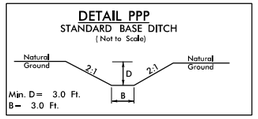
DETAIL OOO
SPECIAL LATERAL 'V' DITCH (Not to Scale)



Min. D= 1.5 Ft.

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 LT.

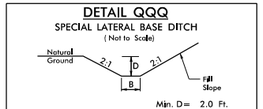
DETAIL PPP
STANDARD BASE DITCH (Not to Scale)



Min. D= 3.0 Ft.
B= 3.0 Ft.

–WBL– STA. 1107+34 RT.

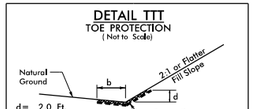
DETAIL QQQ
SPECIAL LATERAL BASE DITCH (Not to Scale)



Min. D= 2.0 Ft.
B= 4.0 Ft.

FROM –WBL– STA. 1114+00 TO STA. 1115+50 RT.

DETAIL TTT
TOE PROTECTION (Not to Scale)

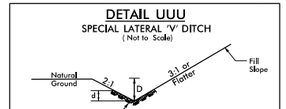


d= 2.0 Ft.
b= 4.0 Ft.

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.

DETAIL UUU
SPECIAL LATERAL 'V' DITCH (Not to Scale)

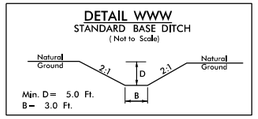


Min. D= 1.5 Ft.
Max. d= 1.0 Ft.

Type of Liner= Class 'B' Rip–Rap

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

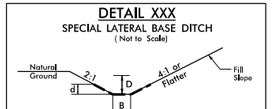
DETAIL WWW
STANDARD BASE DITCH (Not to Scale)



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

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

DETAIL XXX
SPECIAL LATERAL BASE DITCH (Not to Scale)



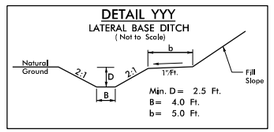
Min. D= 1.5 Ft.
Max. d= 0.5 Ft.
B= 2.0 Ft.

Type of Liner= PSRM

FROM –L– STA. 1161+00 TO STA. 1161+67 LT.

BANK STABILIZATION

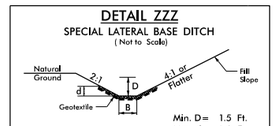
DETAIL YYY
LATERAL BASE DITCH (Not to Scale)



Min. D= 2.5 Ft.
B= 4.0 Ft.
b= 5.0 Ft.

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

DETAIL ZZZ
SPECIAL LATERAL BASE DITCH (Not to Scale)

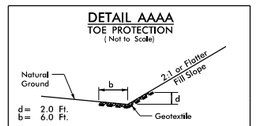


Min. D= 1.5 Ft.
Max. d= 1.0 Ft.
B= 2.0 Ft.

Type of Liner= Class 'I' Rip–Rap

FROM –L– STA. 1175+00 TO STA. 1176+00 LT.

DETAIL AAAA
TOE PROTECTION (Not to Scale)

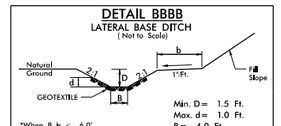


d= 2.0 Ft.
b= 6.0 Ft.

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.

DETAIL BBBB
LATERAL BASE DITCH (Not to Scale)



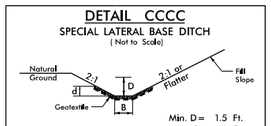
Min. D= 1.5 Ft.
Max. d= 1.0 Ft.
B= 4.0 Ft.
b= 5.0 Ft.

*When B Is < 6.0'

Type of Liner= Class "B" Rip–Rap

FROM –L– STA. 1205+30 TO STA. 1207+00 LT.

DETAIL CCCC
SPECIAL LATERAL BASE DITCH (Not to Scale)

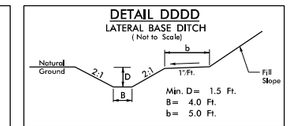


Min. D= 1.5 Ft.
Max. d= 1.0 Ft.
B= 4.0 Ft.

Type of Liner= Class "B" Rip–Rap

FROM –L– STA. 1207+00 TO STA. 1209+50 LT.

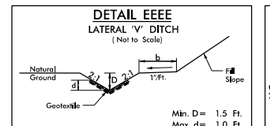
DETAIL DDDD
LATERAL BASE DITCH (Not to Scale)



Min. D= 1.5 Ft.
B= 4.0 Ft.
b= 5.0 Ft.

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

DETAIL EEEE
LATERAL 'V' DITCH (Not to Scale)

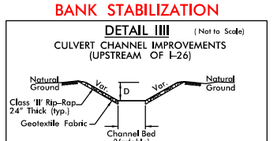


Min. D= 1.5 Ft.
Max. d= 1.0 Ft.
b= 5.0 Ft.

Type of Liner= Class 'B' Rip–Rap

FROM –WBL– STA. 1081+50 TO STA. 1082+50, RT.

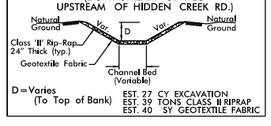
DETAIL IIII
(Not to Scale)
CULVERT CHANNEL IMPROVEMENTS (UPSTREAM OF I–26)



D=Varies (To Top of Bank)
EST. 37 CY EXCAVATION
EST. 55 TONS CLASS II RIPRAP
EST. 56 SY GEOTEXTILE FABRIC

BANK STABILIZATION

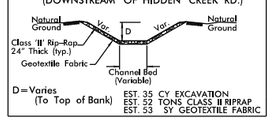
DETAIL FFFF
(Not to Scale)
CULVERT CHANNEL IMPROVEMENTS (DOWNSTREAM OF I–26/ UPSTREAM OF HIDDEN CREEK RD.)



D=Varies (To Top of Bank)
EST. 27 CY EXCAVATION
EST. 39 TONS CLASS II RIPRAP
EST. 40 SY GEOTEXTILE FABRIC

BANK STABILIZATION

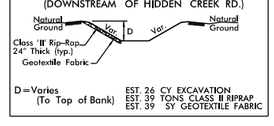
DETAIL GGGG
(Not to Scale)
CULVERT CHANNEL IMPROVEMENTS (DOWNSTREAM OF HIDDEN CREEK RD.)



D=Varies (To Top of Bank)
EST. 35 CY EXCAVATION
EST. 52 TONS CLASS II RIPRAP
EST. 53 SY GEOTEXTILE FABRIC

BANK STABILIZATION

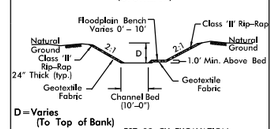
DETAIL HHHH
(Not to Scale)
BANK STABILIZATION IMPROVEMENTS (DOWNSTREAM OF HIDDEN CREEK RD.)



D=Varies (To Top of Bank)
EST. 26 CY EXCAVATION
EST. 39 TONS CLASS II RIPRAP
EST. 39 SY GEOTEXTILE FABRIC

BANK STABILIZATION

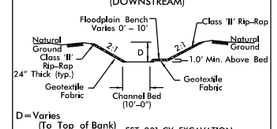
DETAIL JJJJ
(Not to Scale)
CULVERT CHANNEL IMPROVEMENTS (UPSTREAM)



D=Varies (To Top of Bank)
EST. 98 CY EXCAVATION
EST. 146 TONS CLASS II RIPRAP
EST. 147 SY GEOTEXTILE FABRIC

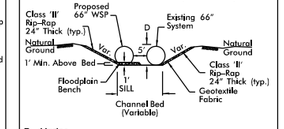
BANK STABILIZATION

DETAIL KKKK
(Not to Scale)
CULVERT CHANNEL IMPROVEMENTS (DOWNSTREAM)



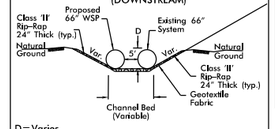
D=Varies (To Top of Bank)
EST. 201 CY EXCAVATION
EST. 299 TONS CLASS II RIPRAP
EST. 302 SY GEOTEXTILE FABRIC

DETAIL LLLL
(Not to Scale)
CULVERT CHANNEL IMPROVEMENTS WITH BENCH & SILL (UPSTREAM)



D=Varies (To Top of Bank)
EST. 68 CY EXCAVATION
EST. 100 TONS CLASS II RIPRAP
EST. 101 SY GEOTEXTILE FABRIC

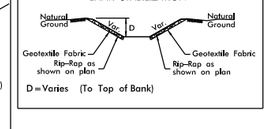
DETAIL MMMM
(Not to Scale)
CULVERT CHANNEL IMPROVEMENTS (DOWNSTREAM)



D=Varies (To Top of Bank)
EST. 55 CY EXCAVATION
EST. 82 TONS CLASS II RIPRAP
EST. 83 SY GEOTEXTILE FABRIC

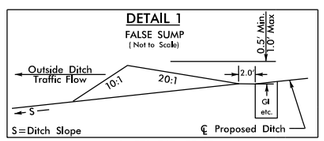
BANK STABILIZATION

DETAIL YYYY
(Not to Scale)
BANK STABILIZATION



D=Varies (To Top of Bank)

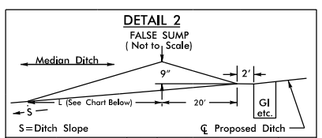
DETAIL 1
FALSE SUMP (Not to Scale)



S=Ditch Slope ℄ Proposed Ditch

–L– STA. 849+02 LT
–WBL– STA. 994+51 RT.
–WBL– STA. 996+06 RT.
–Y13RPD– STA. 18+61 LT
–Y13RPD– STA. 14+00 LT
–WBL– 1097+15 LT.

DETAIL 2
FALSE SUMP (Not to Scale)

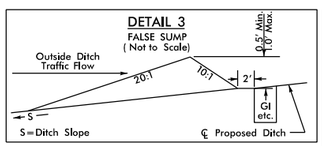


S=Ditch Slope ℄ Proposed Ditch

Ditch Grade	L	Ditch Grade	L
0.0% To 2.0%	20'	Over 4.0% To 6.0%	40'
Over 2.0% To 4.0%	30'	Over 6.0%	50'

–EBL– STA. 902+53 RT
–EBL– STA. 905+22 RT
–EBL– STA. 907+54 RT
–EBL– STA. 909+71 RT
–EBL– STA. 911+56 RT
–EBL– STA. 912+68 RT
–EBL– STA. 916+83 RT
–EBL– STA. 923+67 RT
–EBL– STA. 931+86 RT
–EBL– STA. 934+32 RT
–EBL– STA. 940+30 RT
–EBL– STA. 947+30 RT
–EBL– STA. 952+57 RT
–EBL– STA. 955+03 RT
–EBL– STA. 958+07 RT
–EBL– STA. 961+10 RT
–EBL– STA. 964+00 RT
–EBL– STA. 972+90 RT
–EBL– STA. 976+83 RT

DETAIL 3
FALSE SUMP (Not to Scale)

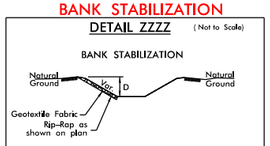


S=Ditch Slope ℄ Proposed Ditch

–Y13RPC– STA. 10+07 RT
–L– STA. 850+34 RT
–L– STA. 854+53 RT
–WBL– STA. 895+60 RT
–EBL– STA. 911+57 LT
–EBL– STA. 914+55 LT
–EBL– STA. 916+85 LT
–L– STA. 1037+28 RT
FROM STA. 1082+00 TO STA. 1085+00, RT.
–EBL– STA. 1109+15 LT.
–EBL– STA. 1113+15 LT.
–EBL– STA. 1114+70 LT.
–EBL– STA. 1119+22 LT.

BANK STABILIZATION

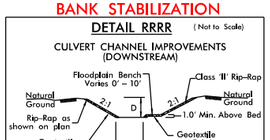
DETAIL ZZZZ
(Not to Scale)
BANK STABILIZATION



D=Varies (To Top of Bank)

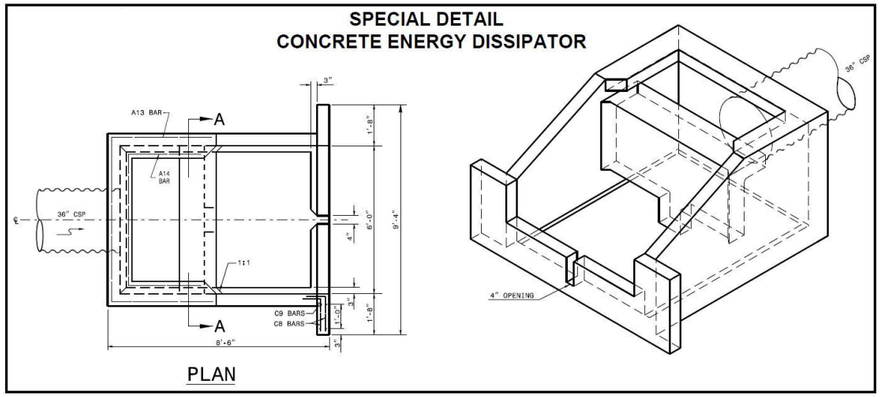
BANK STABILIZATION

DETAIL RRRR
(Not to Scale)
CULVERT CHANNEL IMPROVEMENTS (DOWNSTREAM)



D=Varies (To Top of Bank)

SPECIAL DETAIL
CONCRETE ENERGY DISSIPATOR



PLAN

12/13/2018
14700_HYD_PRM_DrainageDetails.dgn
HNTB

8/17/99

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No. C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	4
R/W SHEET NO.	I-4700A-16
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83

WETLAND & STREAM IMPACTS

*NOTE:
AIRPORT ROAD UNDER CONSTRUCTION.
VARIOUS UTILITIES WERE BEING RELOCATED AND
E OF SUE FIELD SURVEYS.

LEGEND
DENOTES IMPACTS IN SURFACE WATER

PERMIT DRAWING SHEET 3 OF 97

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

SITE 1

SDI

NON JS FROM –Y13RPB– STA. 14+63
TO –Y13RPB– 15+65

NON JS

FOR –L– PROFILE, SEE SHEETS 36 & 37
FOR –Y13RPB– PROFILE, SEE SHEET 63
FOR –Y13RPC– PROFILE, SEE SHEET 64
FOR RETAINING WALL –RW0–, SEE SHEET W-1

MATCHLINE SHEET 5
–L– STA 846+25.00

50' 0' 50' 100' 150'
GRAPHIC SCALE

11/30/2018
I-4700
I-4700_HYD_PRM_PSH_04.dgn
HNTB

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
I-4700	4
R/W SHEET NO.	I-4700A-16
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HNTB NORTH CAROLINA, P.C. 343 Fayetteville Street, Suite 200 Raleigh, North Carolina 27601 NC License No. C-1554

NAD 83

WETLAND & STREAM IMPACTS

PERMIT DRAWING SHEET 4 OF 97

NOTE:
AIRPORT ROAD UNDER CONSTRUCTION.
VARIOUS UTILITIES WERE BEING RELOCATED AND
SOME OF SUE FIELD SURVEYS.

LEGEND
DENOTES IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

SITE 1

SDI

NON JS FROM –Y13RPB– STA. 14+63
TO –Y13RPB– 15+65

NON JS

50:1 FDPS TRANSITION FROM 12'-0" AT STA. 10+83 TO 11'-6" AT STA. 11+00

FOR –L– PROFILE, SEE SHEETS 36 & 37
FOR –Y13RPB– PROFILE, SEE SHEET 63
FOR –Y13RPC– PROFILE, SEE SHEET 64
FOR RETAINING WALL –RW0–, SEE SHEET W-1

MATCHLINE SHEET 5
–L– STA 846+25.00

GRAPHIC SCALE 50' 0' 50' 100' 150'

11/30/2018
I-4700
I-4700_HYD_PRM_PSH_04.dgn
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8/17/99

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NC License No. C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	7
R/W SHEET NO.	I-4700A - 18
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

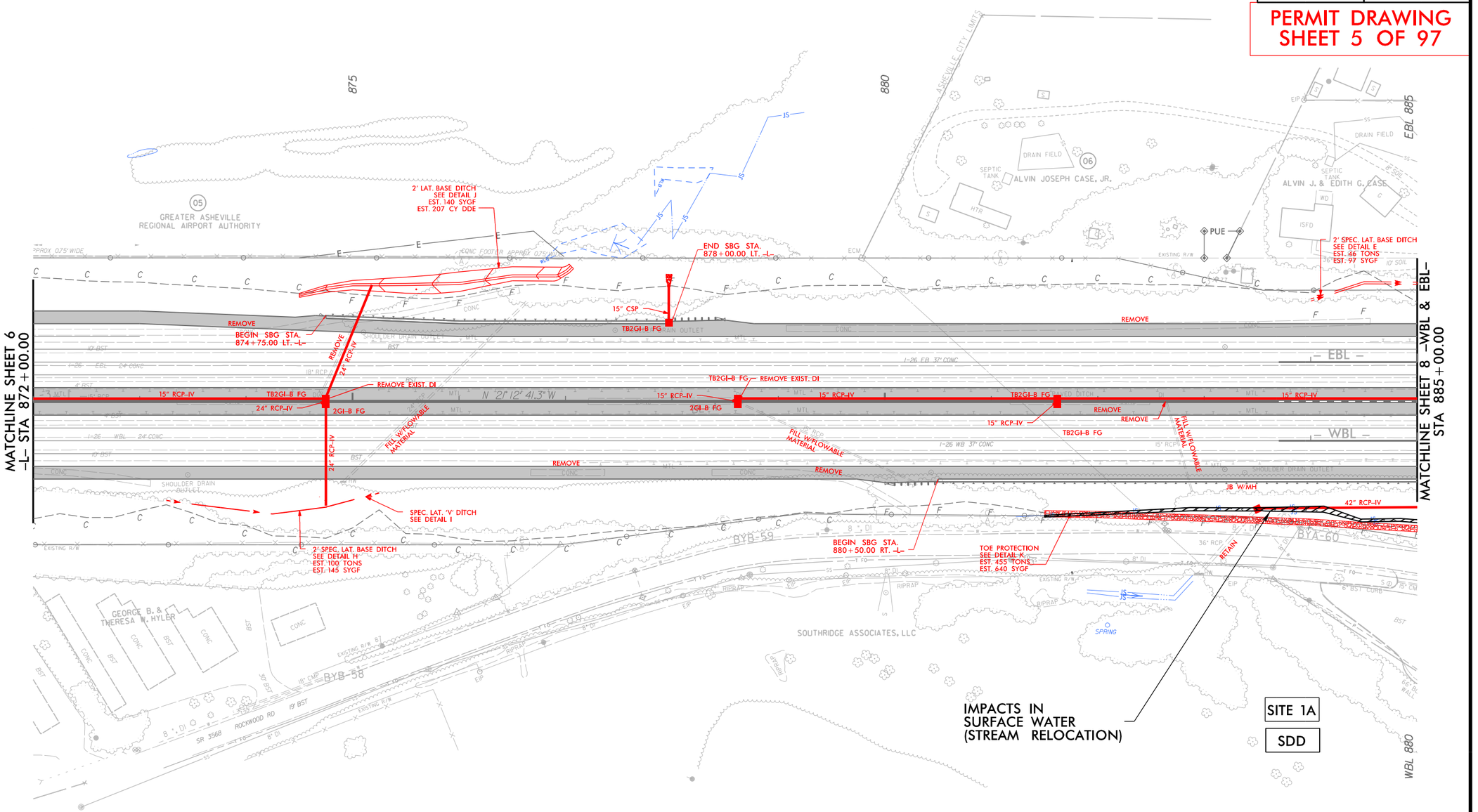
NAD 83

WETLAND & STREAM IMPACTS

LEGEND

DENOTES IMPACTS IN SURFACE WATER

PERMIT DRAWING SHEET 5 OF 97



50' 0' 50' 100' 150'
GRAPHIC SCALE

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

11/24/2008
I-4700A_HYD_PRM_PSH_07.dgn
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8/17/99

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343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No. C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	7
R/W SHEET NO.	I-4700A - 18
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83

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

2' LAT. BASE DITCH SEE DETAIL J EST. 140 SYGF EST. 207 CY DDE

END SBG STA. 878+00.00 LT. –L–

BEGIN SBG STA. 874+75.00 LT. –L–

REMOVE

15" CSP

TB2GI-B FG

REMOVE EXIST. DI

15" RCP-IV

24" RCP-IV

2GI-B FG

FILL W/FLOWABLE MATERIAL

SPEC. LAT. 'V' DITCH SEE DETAIL I

2' SPEC. LAT. BASE DITCH SEE DETAIL H EST. 100 TONS EST. 145 SYGF

2' SPEC. LAT. BASE DITCH SEE DETAIL E EST. 46 TONS EST. 97 SYGF

BEGIN SBG STA. 880+50.00 RT. –L–

TOE PROTECTION SEE DETAIL K EST. 455 TONS EST. 640 SYGF

JB W/MH

42" RCP-IV

36" RCP

RETAIN

PUE

EBL

WBL

GREATER ASHEVILLE REGIONAL AIRPORT AUTHORITY

ALVIN JOSEPH CASE, JR.

ALVIN JR. & EDITH G. CASE

GEORGE B. & THERESA W. HYLER

SOUTHRIDGE ASSOCIATES, LLC

SR 3568 ROCKWOOD RD

BYB-58

BYB-59

BYA-60

N 21°12'41.3" W

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

SITE 1A

SDD

50' 0' 50' 100' 150'
GRAPHIC SCALE

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

11/24/2008
I:\I-4700A_HYD_PRM_PSH_07.dgn
HNTB

8/17/99

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343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No. C-1554

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

NAD 83

WETLAND & STREAM IMPACTS

LEGEND
- JS JS — DENOTES IMPACTS IN SURFACE WATER
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PERMIT DRAWING SHEET 7 OF 97

MATCHLINE SHEET 7 –WBL & EBL– STA 885+00.00

MATCHLINE SHEET 9 –EBL– STA 898+29.18

MATCHLINE SHEET 9 –WBL– STA 898+00.00

EDWARD LEE WYATT

REBECCA GAIL SWEEZY

ALVIN J. & EDITH G. CASE

GREATER ASHEVILLE REGIONAL AIRPORT AUTHORITY

JERRY G. & VICKIE L. ISRAEL

JAMES E. FELDER

FIRST AID AUTO, LLC

ROCKWOOD ROAD LAND, LLC

SDC

SITE 3

SITE 2

SITE 1A

SDD

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL HHHH

IMPACTS IN SURFACE WATER (6'X6' RCBC)

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL IIII

TEMP. IMPACTS IN SURFACE WATER

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

CULVERT NOT BURIED

CULVERT CHANNEL IMPROVEMENTS (DOWNSTREAM) SEE DETAIL FFFF

BANK STABILIZATION SEE DETAIL HHHH

CULVERT CHANNEL IMPROVEMENTS (DOWNSTREAM) SEE DETAIL GGGG

2' LAT. BASE DITCH SEE DETAIL I EST. 315 TONS EST. 530 SYGF EST. 700 CY DDE

CLASS 'B' RIPRAP EST. 5 TONS EST. 16 SYGF

REMOVE 23 LF OF EX. 18" CMP

42" WELDED STEEL PIPE 0.625" WALL THICKNESS TRENCHLESS INSTALLATION

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

END SBG STA. 889+00.00 RT. –WBL–

2' LAT. BASE DITCH SEE DETAIL N EST. 50 TONS EST. 115 SYGF EST. 565 CY DDE

BERM DITCH SEE DETAIL B EST. 160 SYGF

TOE PROTECTION SEE DETAIL K EST. 40 TONS EST. 55 SYGF

REMOVE 28 LF OF EX. 18" RCP

CLASS 'B' RIPRAP EST. 5 TONS EST. 14 SYGF

BERM DITCH SEE DETAIL M

BERM DITCH SEE DETAIL B EST. 240 SYGF

GRAPHIC SCALE 50' 0' 50' 100' 150'

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

11/28/2018
I-4700A_HYD_PRM_PSH_08.dgn
HNTB

8/17/99

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No. C-1554

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

PERMIT DRAWING SHEET 8 OF 97

WETLAND & STREAM IMPACTS

NAD 83

LEGEND
- JS JS — DENOTES IMPACTS IN SURFACE WATER
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

EDWARD LEE WYATT
REBECCA GAIL SWEEZY
ALVIN J. & EDITH G. CASE
GREATER ASHEVILLE REGIONAL AIRPORT AUTHORITY
JERRY GU & VICKIE L. ISRAEL
JAMES E. FELDER
FIRST AID AUTO, LLC
ROCKWOOD ROAD LAND, LLC

EBL 885
EBL 890
EBL 895
WBL 885
WBL 890
WBL 895

SR 3525 HIDDEN CREEK RD
SR 3568 ROCKWOOD RD

SDC
SITE 3
SITE 2
SITE 1A
SDD

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)
TEMP. IMPACTS IN SURFACE WATER
IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL HHHH
IMPACTS IN SURFACE WATER (6'X6' RCBC)
IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL IIII
TEMP. IMPACTS IN SURFACE WATER
TEMP. IMPACTS IN SURFACE WATER
IMPACTS IN SURFACE WATER (STREAM RELOCATION)

CULVERT NOT BURIED

MATCHLINE SHEET 7 –WBL & EBL– STA 885+00.00
MATCHLINE SHEET 9 –EBL– STA 898+29.18
MATCHLINE SHEET 9 –WBL– STA 898+00.00

50' 0' 50' 100' 150'
GRAPHIC SCALE

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

11/28/2018
I-4700A_HYD_PRM_PSH_08.dgn
HNTB

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No. C-1554

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

PERMIT DRAWING SHEET 9 OF 97

SITE 3 SDC

NAD 83

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)

CSP

30" CSP

REMOVE 23 LF OF EX. 18"C CMP

2GI–B FG

18" RCP–IV

FILL W/ FLOWABLE MATERIAL

RETAIN

30" RCP–IV

TB2GI–B FG

TB2GI–A FG

15" RCP–IV

TB2GI–B FG

MH

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

CULVERT NOT BURIED

IMPACTS IN SURFACE WATER (6'X6' RCBC)

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL IIII

TEMP. IMPACTS IN SURFACE WATER

LEGEND

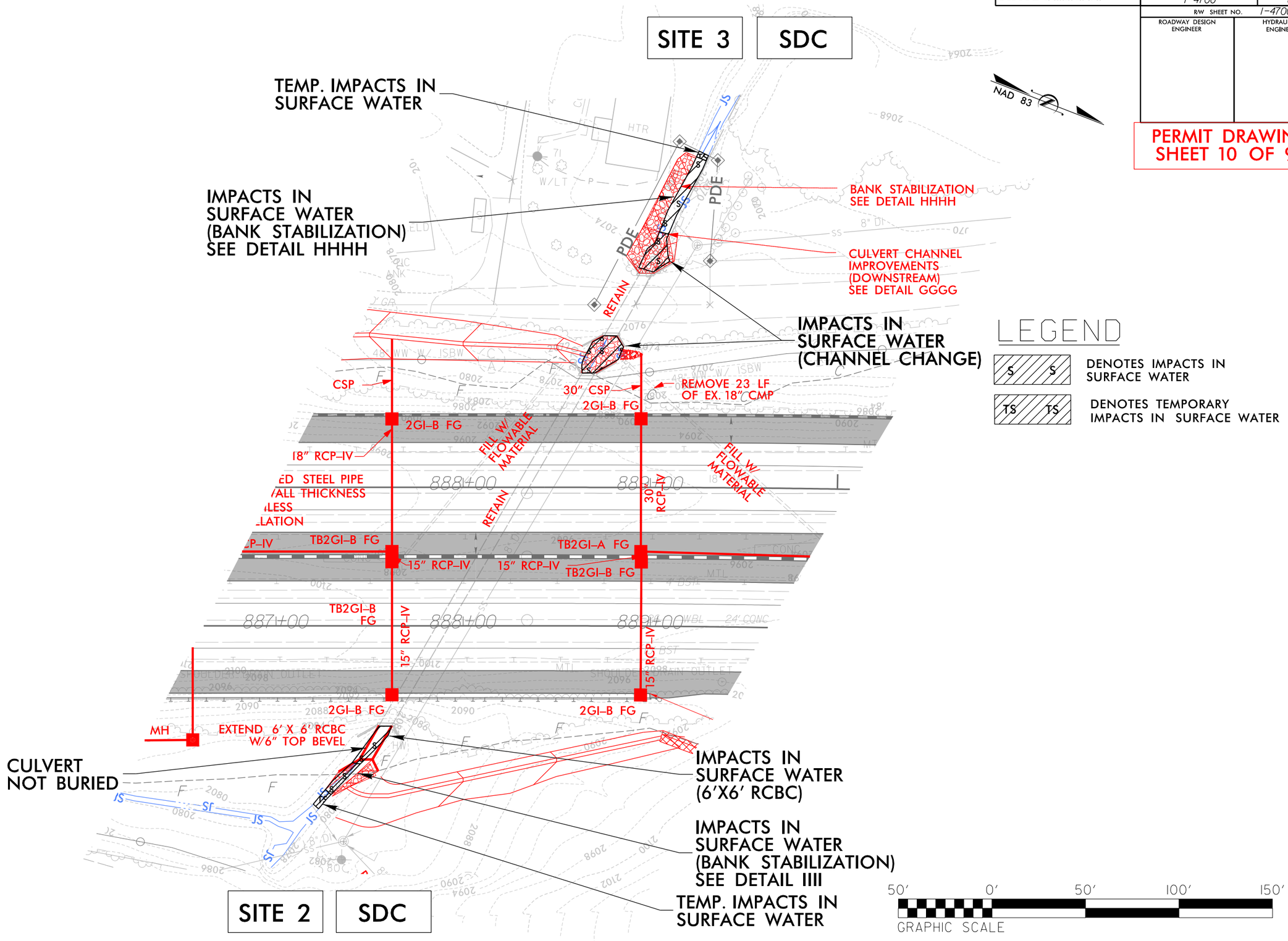
- S S — DENOTES IMPACTS IN SURFACE WATER
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50' 0' 50' 100' 150'
GRAPHIC SCALE

SITE 2 SDC

HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License Num C-1554	PROJECT REFERENCE NO.	SHEET NO.
	I-4700	8
	R/W SHEET NO.	I-4700A – 19
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 10 OF 97

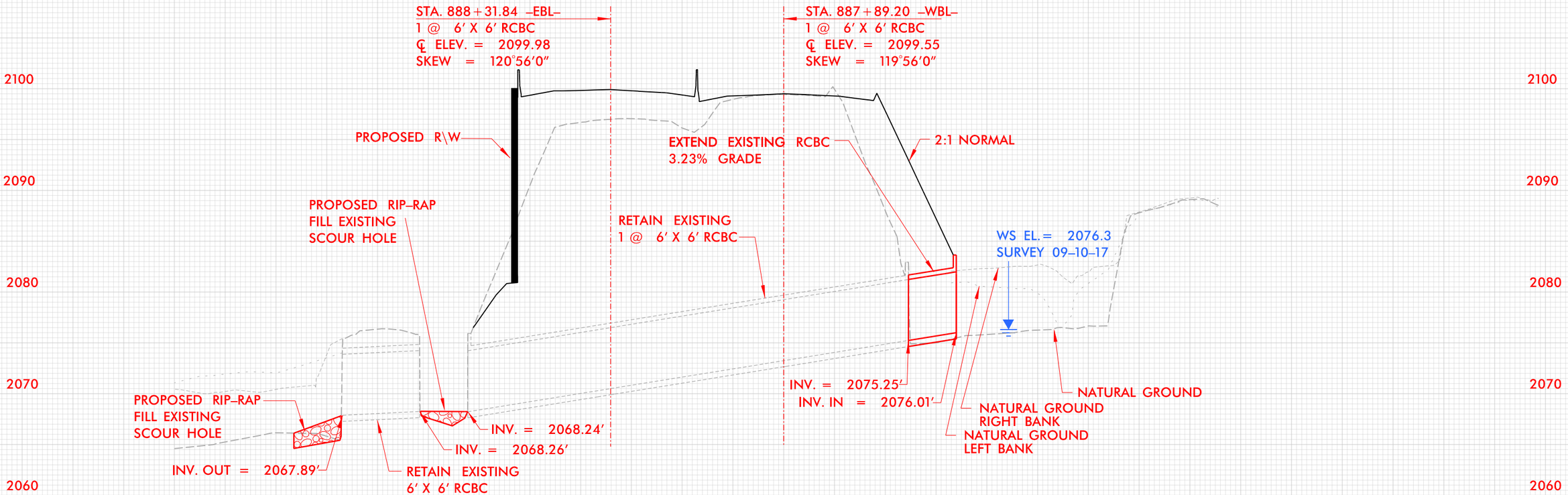


6/23/16

PROJ. REFERENCE NO.	SHEET NO.
I-4700	

PERMIT DRAWING
SHEET 11 OF 97

250 200 150 100 50 ℄ 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.)

11/25/2018
I-4700A_HYD_PRM_PSH_08B_PFL.dgn
HNTB

8/17/99

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No. C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	10
R/W SHEET NO.	I-4700A - 21
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83

PERMIT DRAWING SHEET 12 OF 97

WETLAND & STREAM IMPACTS

LEGEND

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

SITE 6 SDE

SITE 5 SDE

SITE 4 SDE

PIPE NOT BURIED

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

IMPACTS IN SURFACE WATER (66" RCP)

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL LLLL

TEMP. IMPACTS IN SURFACE WATER

MATCHLINE SHEET 9 -EBL- STA 911+28.88

MATCHLINE SHEET 9 -WBL- STA 911+00.00

MATCHLINE SHEET 11 -EBL- STA 923+74.50

MATCHLINE SHEET 11 -WBL- STA 924+00.00

EBL 915

EBL 920

WBL 95

WBL 920

SR 3524 NEW ROCKWOOD ROAD

CLASS 'B' RIPRAP EST. 5 TONS EST. 14 SYGF

SPECIAL CUT DITCH SEE DETAIL V

DOWNSTREAM CHANNEL IMPROVEMENTS SEE DETAIL MMMM

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

CLASS 'I' RIPRAP EST. 15 TONS EST. 30 SYGF

2' LAT. BASE DITCH SEE DETAIL YY EST. 134 CY DDE

2' LAT. BASE DITCH SEE DETAIL YY EST. 1196 CY DDE

REMOVE 22 LF 18" CSP

UPSTREAM CHANNEL IMPROVEMENTS SEE DETAIL LLLL

BEGIN WALL GUTTER 918+25.00 RT. -WBL-

CONVERT DI TO JB W/MH

BEGIN SBG STA. 922+50.00 LT. -WBL-

END WALL GUTTER 923+75.00 RT. -WBL-

SPEC. LAT. 'V' DITCH SEE DETAIL T EST. 55 SYGF

CONCRETE PATCH BEHIND RETAINING WALL - SEE DETAIL U

AUDREY CRAIG

TIMOTHY D. GASPERSON, ET AL

CECILY ANN HART

KEVIN S. KNOWLAND

DEBBIE M. MELTON

GAIL L. GREENHILL

MARGARET M. BARLOW

SUSAN L. & ELIZABETH M. HARWOOD

STANLEY J. ARKIN, ET AL

ROBERT SPINO, JR. & KRISTIE K. SPINO

DAPHNE D. OWENBY

DYLAN D. SKIDMORE

GRAPHIC SCALE 50' 0' 50' 100' 150'

11/29/2018
I-4700A_HYD_PRM_PSH_10.dgn
HNTB

8/17/99

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No. C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	10
R/W SHEET NO.	I-4700A - 21
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 13 OF 97

NAD 83

WETLAND & STREAM IMPACTS

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

SITE 6 SDE

SITE 5 SDE

SITE 4 SDE

PIPE NOT BURIED

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

IMPACTS IN SURFACE WATER (66" RCP)

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL LLLL

TEMP. IMPACTS IN SURFACE WATER

MATCHLINE SHEET 9 -WBL- STA 911+00.00 -EBL- STA 911+28.88

MATCHLINE SHEET 11 -EBL- STA 923+74.50 -WBL- STA 924+00.00

EBL 915

EBL 920

WBL 915

WBL 920

50' 0' 50' 100' 150'
GRAPHIC SCALE

11/29/2018
I-4700A_HYD_PRM_PSH_10.dgn
HNTB

HNTB NORTH CAROLINA, P.C. 343 Fayetteville Street, Suite 200 Raleigh, North Carolina 27601 NC License No# C-1554	PROJECT REFERENCE NO.	SHEET NO.
	I-4700	10
	R/W SHEET NO.	I-4700A – 2I
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 14 OF 97

SITE 6 SDE

SITE 5 SDE

SITE 4 SDE

DOWNSTREAM CHANNEL IMPROVEMENTS SEE DETAIL MMMM

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

PIPE NOT BURIED

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

66" WELDED STEEL PIPE 0.875" WALL THICKNESS TRENCHLESS INSTALLATION

RETAIN/LINE W/APPROVED LINER

24" CSP

FS-3

18" RCP-IV

IMPACTS IN SURFACE WATER 66" RCP

BLIND TBJB

18" RCP-V

REMOVE HW

REMOVE HW & INSTALL BLIND TBJB

REMOVE HW & INSTALL BLIND JB

66" RCP-IV

JB W/ MH

66" RCP-IV

18" RCP-IV

IMPACTS IN SURFACE WATER (66" RCP)

GTD

RETAIN

JB W/MH

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL LLLL

UPSTREAM CHANNEL IMPROVEMENTS SEE DETAIL LLLL

TEMP. IMPACTS IN SURFACE WATER

NAD 83

LEGEND

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50′ 0′ 50′ 100′ 150′

GRAPHIC SCALE

HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License Num C-1554	PROJECT REFERENCE NO.	SHEET NO.
	I-4700	10
	R/W SHEET NO.	I-4700A – 21
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 15 OF 97

SITE 6 SDE

SITE 5 SDE

SITE 4 SDE

DOWNSTREAM CHANNEL IMPROVEMENTS SEE DETAIL MMMM

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

PIPE NOT BURIED

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

66" WELDED STEEL PIPE 0.875" WALL THICKNESS TRENCHLESS INSTALLATION

RETAINLINE W/APPROVED LINER

24" CSP

FS-3

18" RCP-IV

IMPACTS IN SURFACE WATER 66" RCP

BLIND TBJB

18" RCP-V

REMOVE HW

REMOVE HW & INSTALL BLIND TBJB

REMOVE HW & INSTALL BLIND JB

66" RCP-IV

JB W/ MH

66" RCP-IV

18" RCP-IV

IMPACTS IN SURFACE WATER (66" RCP)

GTD

RETAIN

JB W/MH

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL LLLL

UPSTREAM CHANNEL IMPROVEMENTS SEE DETAIL LLLL

TEMP. IMPACTS IN SURFACE WATER

NAD 83

LEGEND

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50' 0' 50' 100' 150'

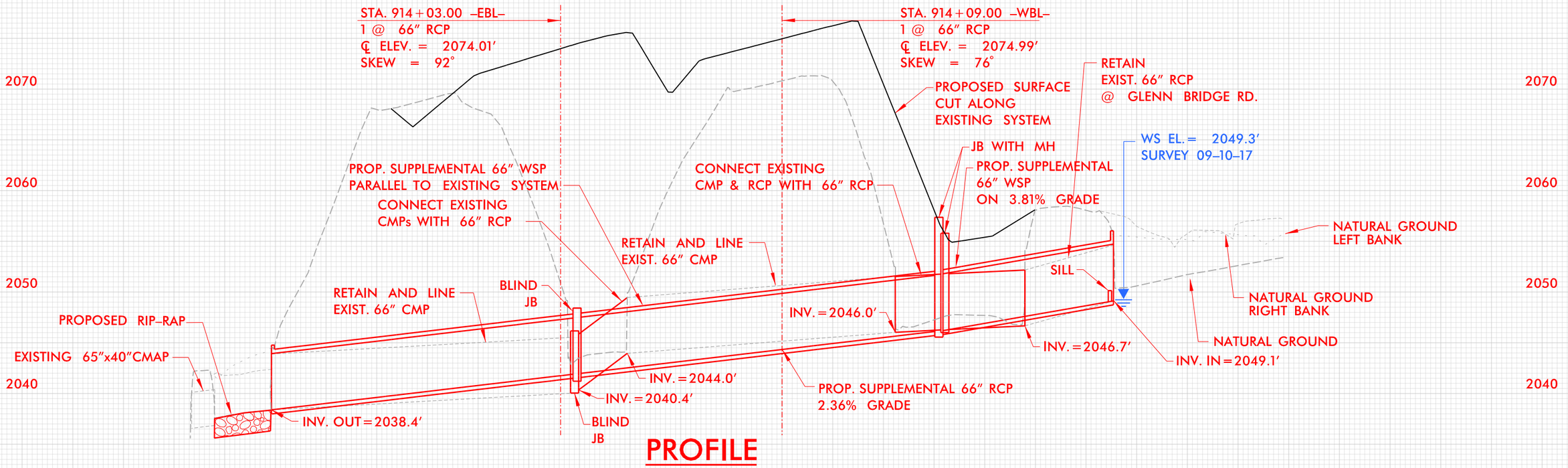
GRAPHIC SCALE

6/23/16

PROJ. REFERENCE NO.	SHEET NO.
I-4700	

PERMIT DRAWING
SHEET 16 OF 97

250 200 150 100 50 ℄ 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.)

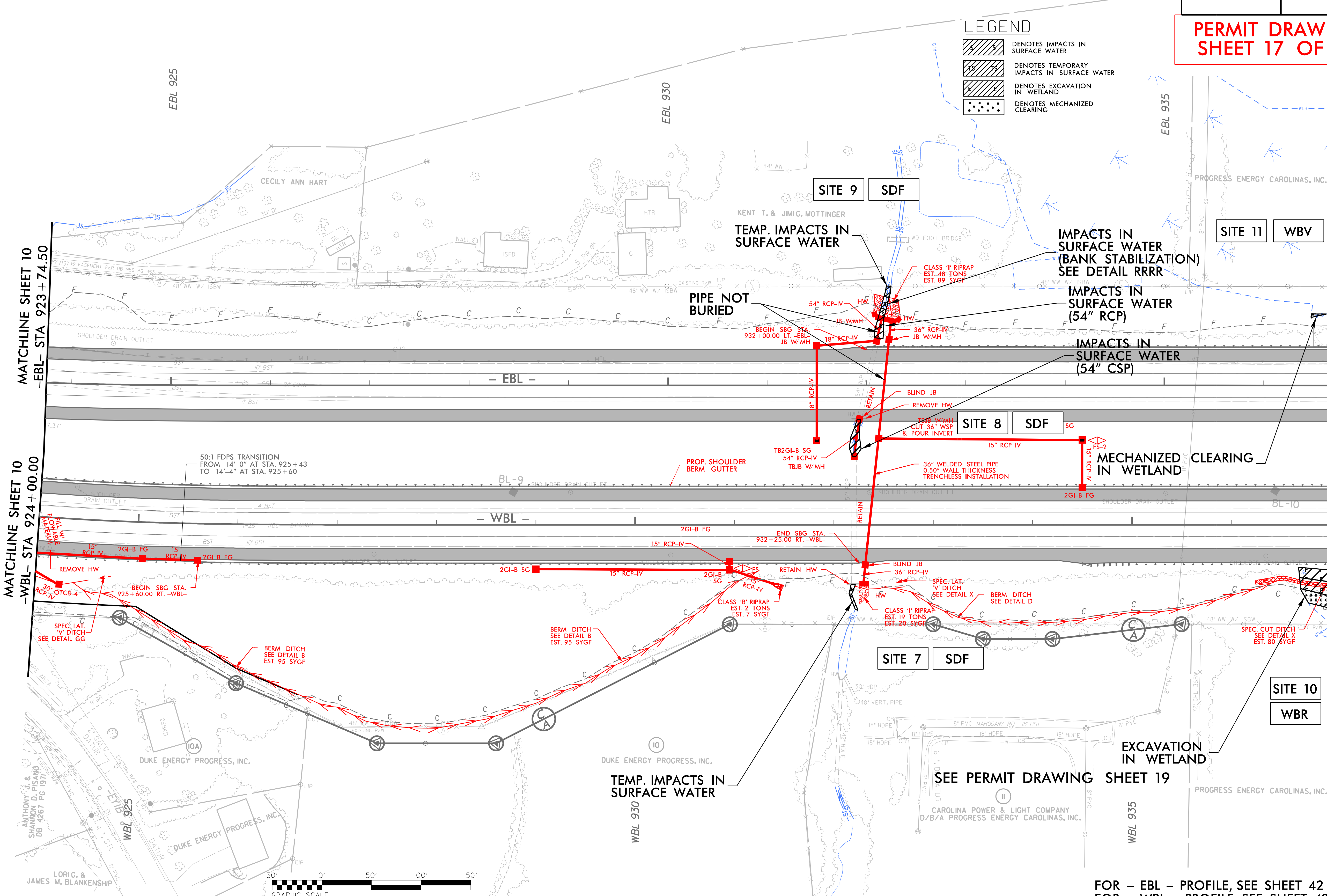
11/29/2018
I-4700A_HYD_PRM_PSH_10B_PFL.dgn
HNTB

PROJECT REFERENCE NO.	SHEET NO.
I-4700	11
R/W SHEET NO.	I-4700A-22
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HNTB NORTH CAROLINA, P.C.

PERMIT DRAWING
SHEET 17 OF 97

WETLAND & STREAM IMPACTS



NAD 83
LEGEND
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES EXCAVATION IN WETLAND
DENOTES MECHANIZED CLEARING
EBL 925
EBL 930
EBL 935
CECILY ANN HART
KENT T. & JIMI G. MOTTINGER
PROGRESS ENERGY CAROLINAS, INC.
SITE 9
SDF
SITE 11
WBV
SITE 8
SDF
SITE 7
SDF
SITE 10
WBR
TEMP. IMPACTS IN SURFACE WATER
IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL RRRR
IMPACTS IN SURFACE WATER (54" RCP)
IMPACTS IN SURFACE WATER (54" CSP)
PIPE NOT BURIED
MECHANIZED CLEARING IN WETLAND
EXCAVATION IN WETLAND
SEE PERMIT DRAWING SHEET 19
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
- EBL -
- WBL -
BL-9
BL-10
50:1 FDPS TRANSITION FROM 14'-0" AT STA. 925+43 TO 14'-4" AT STA. 925+60
PROP. SHOULDER BERM GUTTER
CLASS 'I' RIPRAP EST. 48 TONS EST. 89 SYGF
36" WELDED STEEL PIPE 0.50" WALL THICKNESS TRENCHLESS INSTALLATION
BEGIN SBG STA. 932+00.00 LT. -EBL-
END SBG STA. 932+25.00 RT. -WBL-
BEGIN SBG STA. 925+60.00 RT. -WBL-
BERM DITCH SEE DETAIL B EST. 95 SYGF
BERM DITCH SEE DETAIL D
SPEC. LAT. 'V' DITCH SEE DETAIL GG
SPEC. LAT. 'V' DITCH SEE DETAIL X
CLASS 'B' RIPRAP EST. 2 TONS EST. 7 SYGF
CLASS 'I' RIPRAP EST. 19 TONS EST. 20 SYGF
SPEC. CUT DITCH SEE DETAIL X EST. 80 SYGF
DUKE ENERGY PROGRESS, INC.
CAROLINA POWER & LIGHT COMPANY D/B/A PROGRESS ENERGY CAROLINAS, INC.
ANTHONY J. & SHANNON D. PISANO DB 4267 PG 1976
LORI G. & JAMES M. BLANKENSHIP
WBL 925
WBL 930
WBL 935
GRAPHIC SCALE
50' 0' 50' 100' 150'

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

8/17/99
12/3/2018
I4700A_HYD_PRM_PSH_11.dgn

8/17/99

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No. C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	11
R/W SHEET NO.	I-4700A-22
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83

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
- DENOTES MECHANIZED CLEARING

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

EBL 925 | EBL 930 | EBL 935 | WBL 925 | WBL 930 | WBL 935

SITE 9 SDF

SITE 11 WBV

SITE 8 SDF

SITE 7 SDF

SITE 10 WBR

TEMP. IMPACTS IN SURFACE WATER

PIPE NOT BURIED

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL RRRR

IMPACTS IN SURFACE WATER (54" RCP)

IMPACTS IN SURFACE WATER (54" CSP)

MECHANIZED CLEARING IN WETLAND

EXCAVATION IN WETLAND

TEMP. IMPACTS IN SURFACE WATER

SEE PERMIT DRAWING SHEET 19

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

50:1 FDPS TRANSITION FROM 14'-0" AT STA. 925+43 TO 14'-4" AT STA. 925+60

GRAPHIC SCALE 50' 0' 50' 100' 150'

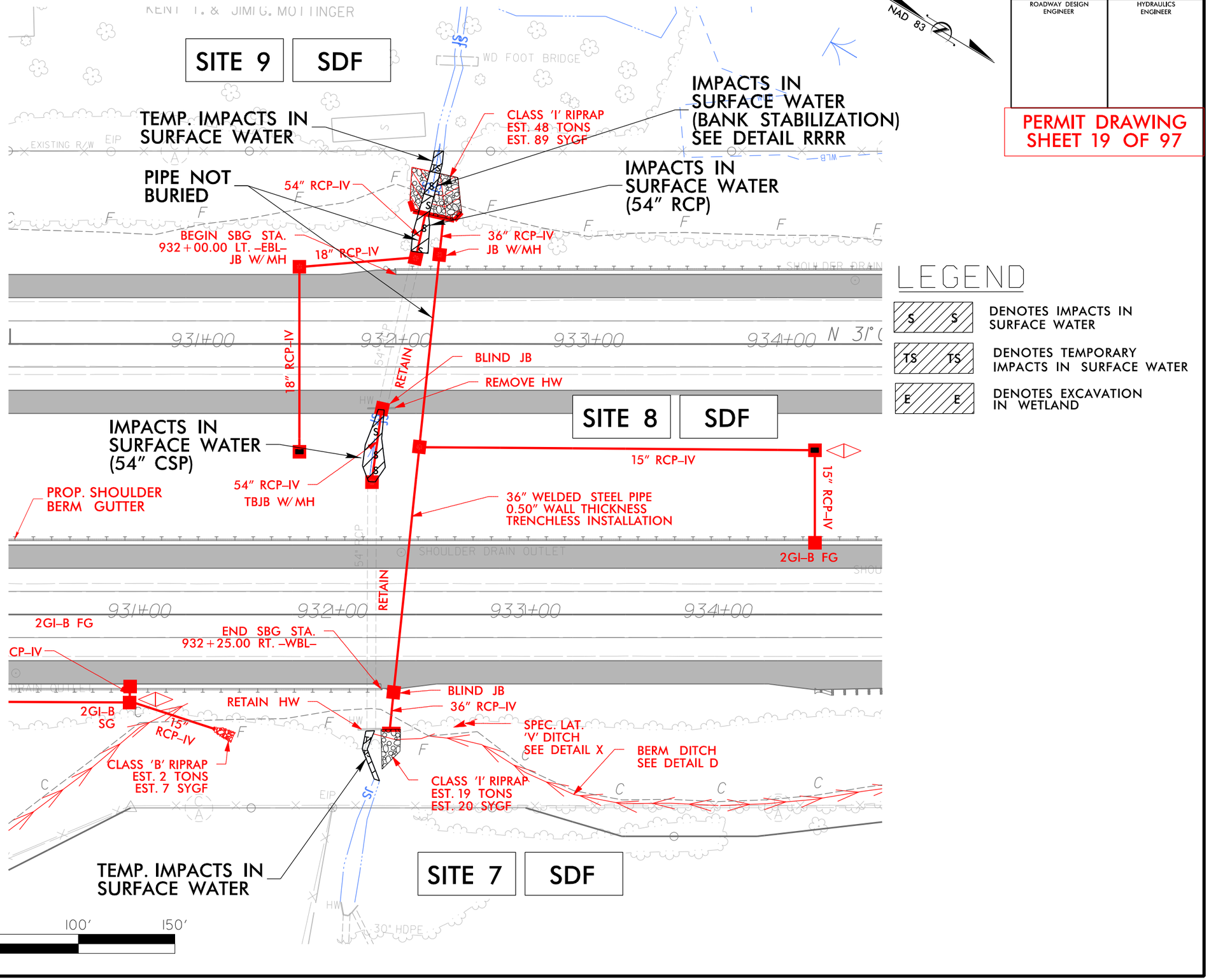
12/13/2018
I-4700A_HYD_PRM_PSH_11.dgn
HNTB

HNTB NORTH CAROLINA, P.C.
343 Fayetteville Street, Suite 200
Raleigh, North Carolina 27601
NC License No. C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	11
R/W SHEET NO.	I-4700A-22
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 19 OF 97

NAD 83



LEGEND

- S S — DENOTES IMPACTS IN SURFACE WATER
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- E E — DENOTES EXCAVATION IN WETLAND

HNTB NORTH CAROLINA, P.C.
343 Fayetteville Street, Suite 200
Raleigh, North Carolina 27601
NC License No. C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	11
R/W SHEET NO.	I-4700A-22
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83

PERMIT DRAWING SHEET 20 OF 97

SITE 9 SDF

SITE 8 SDF

SITE 7 SDF

TEMP. IMPACTS IN SURFACE WATER

PIPE NOT BURIED

54" RCP–IV

CLASS 'I' RIPRAP EST. 48 TONS EST. 89 SYGF

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL RRRR

IMPACTS IN SURFACE WATER (54" RCP)

BEGIN SBG STA. 932+00.00 LT. –EBL– JB W/ MH

18" RCP–IV

36" RCP–IV JB W/MH

18" RCP–IV

RETAIN

BLIND JB

REMOVE HW

IMPACTS IN SURFACE WATER (54" CSP)

54" RCP–IV TBJB W/ MH

PROP. SHOULDER BERM GUTTER

15" RCP–IV

36" WELDED STEEL PIPE 0.50" WALL THICKNESS TRENCHLESS INSTALLATION

15" RCP–IV

2GI–B FG

RETAIN

2GI–B FG

END SBG STA. 932+25.00 RT. –WBL–

CP–IV

BLIND JB

36" RCP–IV

RETAIN HW

2GI–B SG

15" RCP–IV

SPEC. LAT. 'V' DITCH SEE DETAIL X

BERM DITCH SEE DETAIL D

CLASS 'B' RIPRAP EST. 2 TONS EST. 7 SYGF

CLASS 'I' RIPRAP EST. 19 TONS EST. 20 SYGF

TEMP. IMPACTS IN SURFACE WATER

931+00 932+00 933+00 934+00

LEGEND

- S S — DENOTES IMPACTS IN SURFACE WATER
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- E E — DENOTES EXCAVATION IN WETLAND

50′ 0′ 50′ 100′ 150′

GRAPHIC SCALE

8/17/99

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No. C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	12
R/W SHEET NO.	I-4700A-23
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 21 OF 97

WETLAND & STREAM IMPACTS

NAD 83

LEGEND

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

MATCHLINE SHEET 11 –EBL– STA 936+67.20

MATCHLINE SHEET 11 –WBL– STA 937+00.00

MATCHLINE SHEET 13 –EBL– STA 950+67.21

MATCHLINE SHEET 13 –WBL– STA 951+00.00

EBL 940 | EBL 945 | EBL 950 | WBL 940 | WBL 945 | WBL 950

PROGRESS ENERGY CAROLINAS, INC.

SITE 11 | WBV

SITE 10 | SDG | WBR

SITE 12 | SFX | WBU

EXCAVATION IN WETLAND

MECHANIZED CLEARING IN WETLAND

FILL IN WETLAND

IMPACTS IN SURFACE WATER (30" RCP)

TEMP. IMPACTS IN SURFACE WATER

PIPE NOT BURIED

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

CLASS 'I' RIPRAP
EST. 45 TONS
EST. 87 SYGF

Q2= 8.6 cfs
V2= 2.6 fps
Q10= 11.7 cfs
V10= 2.9 fps

CLASS 'B' RIPRAP
EST. 2 TONS
EST. 5 SYGF

CONCRETE ENERGY DISSIPATOR
SEE SPECIAL DETAIL

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

CLASS 'B' RIPRAP
EST. 5 TONS
EST. 17 SYGF

CONTRACTOR TO LOCATE AND EXTEND IF NECESSARY

PROP. SHOULDER BERM GUTTER

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

24" RCP-IV
JB W/MH
2GI-B FG
2GI-A FG 24" RCP-IV
2GI-B FG 15" RCP-IV
REMOVE
18" RCP-IV
24" RCP-IV
REMOVE DI
TB2GI-B SG
FS-2
15" RCP-IV
30" RCP-IV
2GI-B SG
REMOVE

24" WELDED STEEL PIPE
0.50" WALL THICKNESS
TRENCHLESS INSTALLATION

RETAINLINE W/ APPROVED LINER

SPEC. CUT DITCH
SEE DETAIL X
EST. 80 SYGF

SPEC. CUT DITCH
SEE DETAIL BB

CLASS 'I' RIPRAP
EST. 15 TONS
EST. 18 SYGF

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

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

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

CONCRETE DITCH
BEHIND BARRIER
SEE DETAIL Y

CONCRETE DITCH
BEHIND RETAINING WALL
SEE DETAIL U

BEGIN SBG STA.
950+00.00 RT. –WBL–

SPEC. LAT. 'V' DITCH
SEE DETAIL DD

50' 0' 50' 100' 150'
GRAPHIC SCALE

11/29/2018
I:\24700A_HYD_PRM_PSH_12.dgn
HNTB

8/17/99

HNTB NORTH CAROLINA, P.C.
343 Ex. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License Num C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	12
R/W SHEET NO.	I-4700A-23
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 22 OF 97

WETLAND & STREAM IMPACTS

NAD 83

LEGEND

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

MATCHLINE SHEET 11 –EBL– STA 936+67.20

MATCHLINE SHEET 11 –WBL– STA 937+00.00

MATCHLINE SHEET 13 –EBL– STA 950+67.21

MATCHLINE SHEET 13 –WBL– STA 951+00.00

EXCAVATION IN WETLAND

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

CLASS 'I' RIPRAP
EST. 45 TONS
EST. 87 SYGF

SITE 11 | WBV

EXCAVATION IN WETLAND

Q2= 8.6 cfs
V2= 2.6 fps
Q10= 11.7 cfs
V10= 2.9 fps

CLASS 'B' RIPRAP
EST. 2 TONS
EST. 5 SYGF

MECHANIZED CLEARING IN WETLAND

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

FILL IN WETLAND

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

CLASS 'B' RIPRAP
EST. 5 TONS
EST. 17 SYGF

CONTRACTOR TO LOCATE AND EXTEND IF NECESSARY

PROP. SHOULDER BERM GUTTER

MECHANIZED CLEARING IN WETLAND

FILL IN WETLAND

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

HW

24" RCP-IV

JB W/MH

2GI-B FG

18" RCP-IV

REMOVE

REMOVE DI

TB2GI-B SG

FS-2

15" RCP-IV

2GI-A FG 24" RCP-IV

2GI-A FG

REMOVE

24" RCP-IV

REMOVE DI

TB2GI-B SG

FS-2

2GI-B FG 15" RCP-IV

PIPE NOT BURIED

RETAINLINE W/ APPROVED LINER

24" WELDED STEEL PIPE
0.50" WALL THICKNESS
TRENCHLESS INSTALLATION

15" RCP-IV

2GI-B FG

FILL IN WETLAND

JB W/MH

CLASS 'I' RIPRAP
EST. 15 TONS
EST. 18 SYGF

SPEC. CUT DITCH SEE DETAIL X
EST. 80 SYGF

SPEC. CUT DITCH SEE DETAIL BB

EXCAVATION IN WETLAND

MECHANIZED CLEARING IN WETLAND

SITE 10 | SDG | WBR

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

EXCAVATION IN WETLAND

IMPACTS IN SURFACE WATER (30" RCP)

30" RCP-IV

15" RCP-IV

JB W/MH

SPEC. CUT DITCH SEE DETAIL BB

EXCAVATION IN WETLAND

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

MECHANIZED CLEARING IN WETLAND

TEMP. IMPACTS IN SURFACE WATER

EXCAVATION IN WETLAND

PIPE NOT BURIED

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

SITE 12 | SFX | WBU

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

CONCRETE DITCH BEHIND BARRIER SEE DETAIL Y

CONCRETE DITCH BEHIND RETAINING WALL SEE DETAIL U
BEGIN SBG STA 950+00.00 RT. –WBL–

SPEC. LAT. 'V' DITCH SEE DETAIL DD

PROGRESS ENERGY CAROLINAS, INC.

EBL 940 | EBL 945 | EBL 950 | WBL 940 | WBL 945 | WBL 950

50' 0' 50' 100' 150'
GRAPHIC SCALE

11/29/2018
I:\14700A_HYD_PRM_PSH_12.dgn
HNTB

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No. C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	11 & 12
R/W SHEET NO.	I-4700A-23
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 23 OF 97

50' 0' 50' 100' 150'
GRAPHIC SCALE

NAD 83

SITE 11 | WBV

MECHANIZED CLEARING IN WETLAND

MECHANIZED CLEARING IN WETLAND

CLASS 'I' RIPRAP
EST. 45 TONS
EST. 87 SYGF

CLASS 'B' RIPRAP
EST. 2 TONS
EST. 5 SYGF

EXCAVATION IN WETLAND

CONCRETE ENERGY DISSI
SEE SPECIAL DETAIL

48" WW W/ ISBW

HW

24" RCP-IV

JB W/MH

2GI-B FG

SHOULDER DRAIN OUTLET

10' BST

4' BST

937I+00 938I+00 939I+00 940I+00 941I+00

REMOVE

18" RCP-IV

REMOVE DI

FILL IN WETLAND

PIPE NOT BURIED

RETAINLINE W/ APPROVED LINER

24" WELDED STEEL PIPE
0.50" WALL THICKNESS
TRENCHLESS INSTALLATION

15" RCP-IV

2GI-B FG

2GI-B FG

2GI-B FG

15" RCP-IV

PIPE NOT BURIED

RETAINLINE W/ APPROVED LINI

30" RCP

EXCAVATION IN WETLAND

FILL IN WETLAND

937I+00 938I+00 939I+00 940I+00 941I+00 942I+00 943I+00

WBL 24" CONC

IMPACTS IN SURFACE WATER (30" RCP)

JB W/MH

24" RCP-IV

EXCAVATION IN WETLAND

SPEC. CUT DITCH
SEE DETAIL BB

EXCAVATION IN WETLAND

15" RCP-IV

JB W/MH
30" RCP-IV

15" RCP-IV

2GI-B SG

HW

CLASS 'II' RIPRAP
EST. 15 TONS
EST. 16 SYGF

SPEC. CUT DITCH
SEE DETAIL BB

48" WW W/ ISBW

MECHANIZED CLEARING IN WETLAND

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

SPEC. CUT DITCH
SEE DETAIL X
EST. 80 SYGF

SITE 10

SDG | WBR

SITE 12 | SFX

WBU

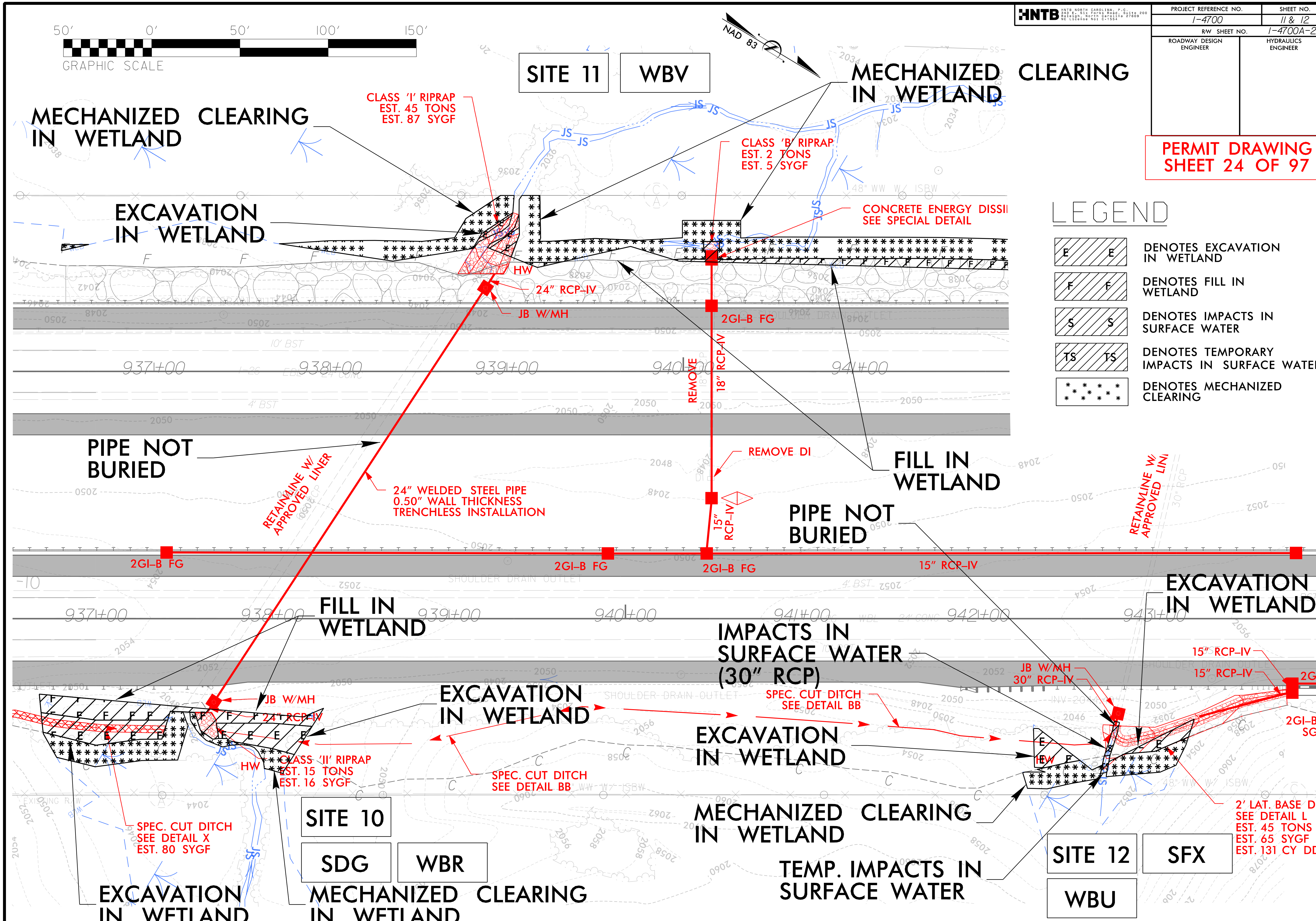
EXCAVATION IN WETLAND

MECHANIZED CLEARING IN WETLAND

TEMP. IMPACTS IN SURFACE WATER

LEGEND

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

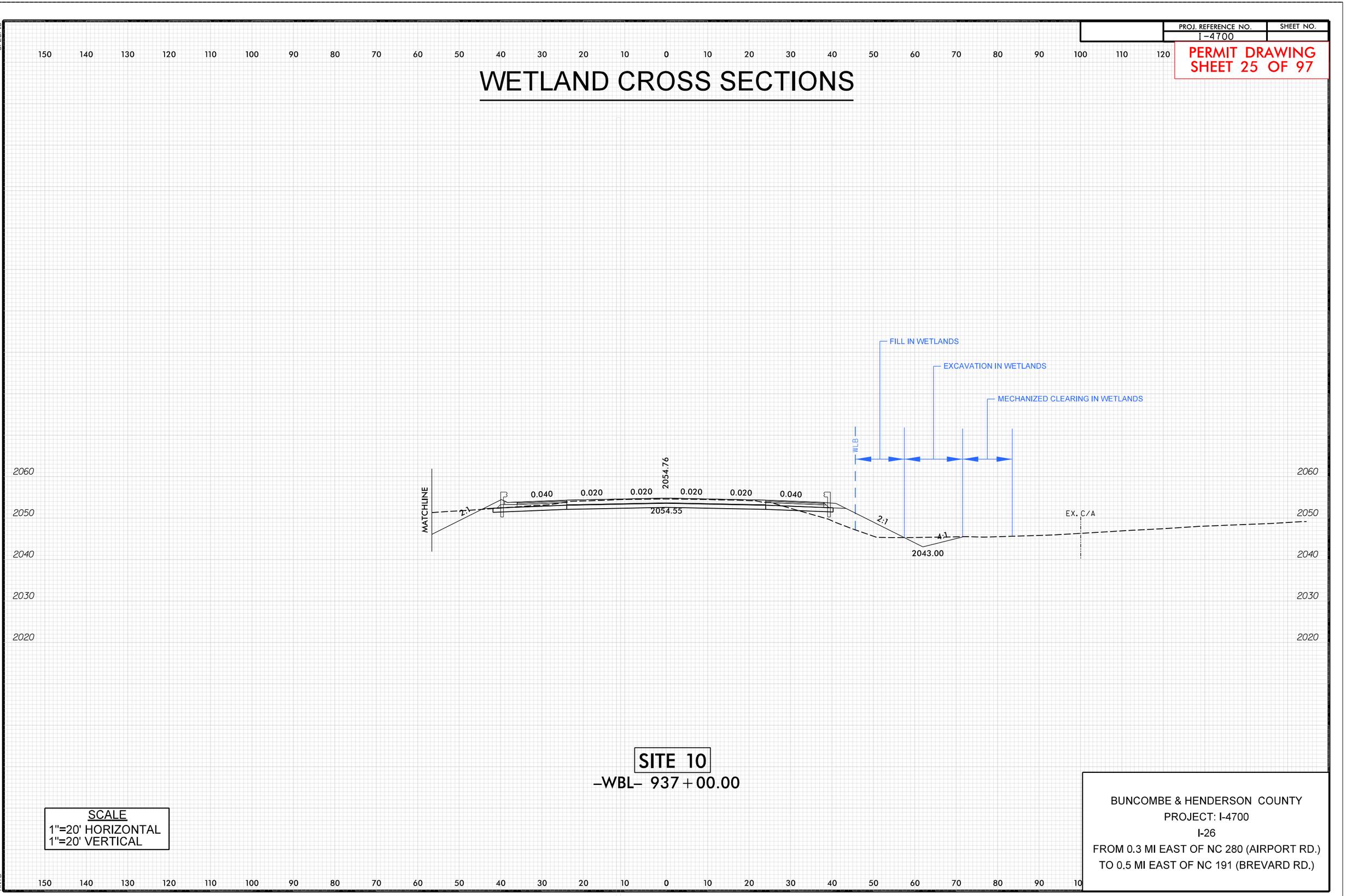

HNTB
PROJECT REFERENCE NO.
I-4700
SHEET NO.
11 & 12
RW SHEET NO.
I-4700A-23
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PERMIT DRAWING
SHEET 24 OF 97
GRAPHIC SCALE
50' 0' 50' 100' 150'
NAD 83
SITE 11
WBV
SITE 10
SDG
WBR
SITE 12
SFX
WBU
MECHANIZED CLEARING IN WETLAND
EXCAVATION IN WETLAND
FILL IN WETLAND
PIPE NOT BURIED
IMPACTS IN SURFACE WATER (30" RCP)
TEMP. IMPACTS IN SURFACE WATER
CLASS 'I' RIPRAP
EST. 45 TONS
EST. 87 SYGF
CLASS 'B' RIPRAP
EST. 2 TONS
EST. 5 SYGF
CONCRETE ENERGY DISSI
SEE SPECIAL DETAIL
CLASS 'II' RIPRAP
EST. 15 TONS
EST. 16 SYGF
24" RCP-IV
JB W/MH
2GI-B FG
18" RCP-IV
REMOVE
REMOVE DI
15" RCP-IV
24" WELDED STEEL PIPE
0.50" WALL THICKNESS
TRENCHLESS INSTALLATION
RETAINLINE W/ APPROVED LINER
SPEC. CUT DITCH
SEE DETAIL BB
SPEC. CUT DITCH
SEE DETAIL X
EST. 80 SYGF
30" RCP-IV
2GI-B SG
2' LAT. BASE DIT
SEE DETAIL L
EST. 45 TONS
EST. 65 SYGF
EST. 131 CY DDE
HW
937+00
938+00
939+00
940+00
941+00
942+00
943+00
LEGEND
DENOTES EXCAVATION IN WETLAND
DENOTES FILL IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES MECHANIZED CLEARING

6/23/16

PROJ. REFERENCE NO.	SHEET NO.
I-4700	

PERMIT DRAWING
SHEET 25 OF 97

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.)

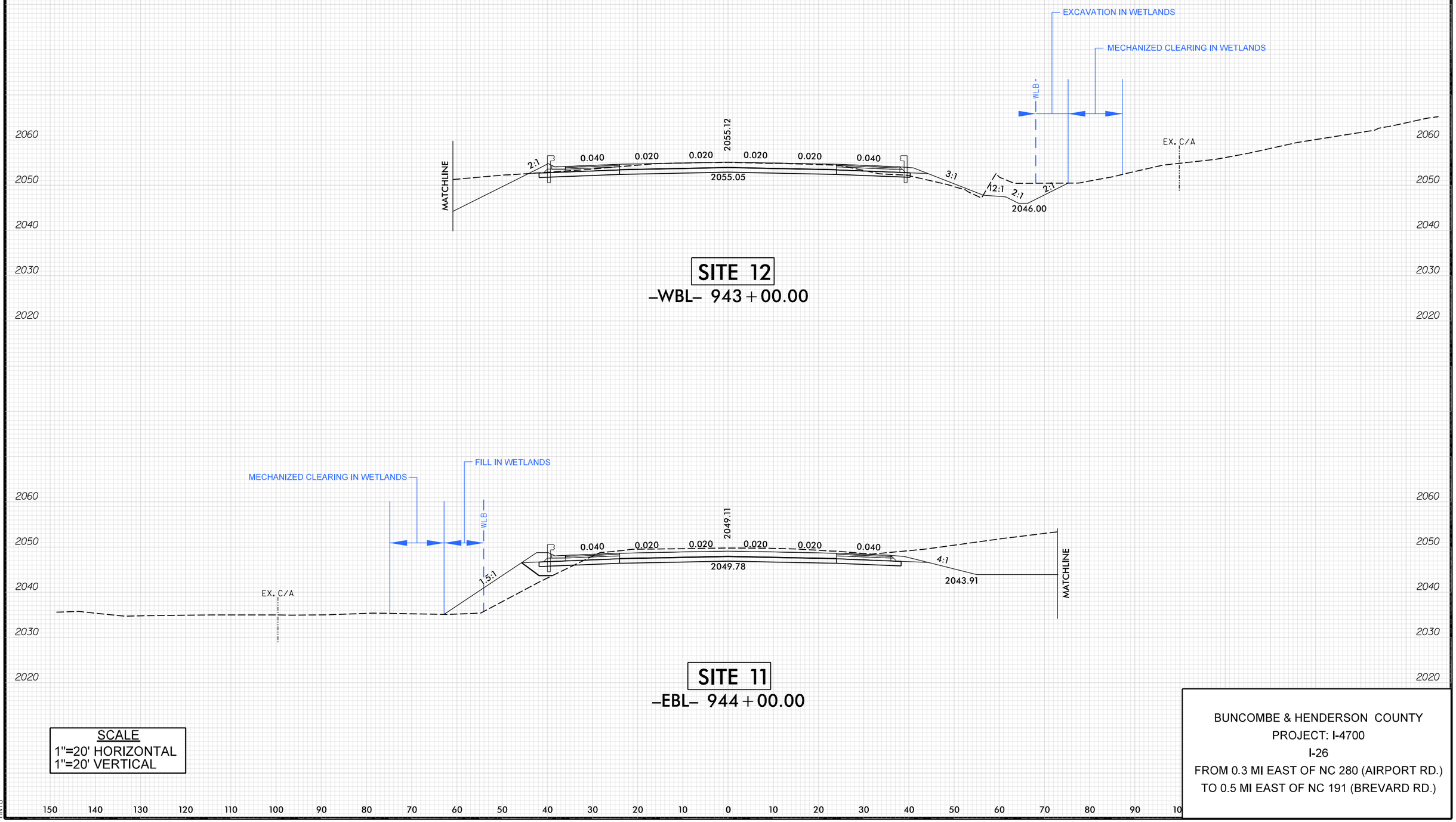
11/30/2016
I-4700A_HYD_PRM_PSH_XPL
HNTB

6/23/16

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

PERMIT DRAWING SHEET 26 OF 97

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.)

12/13/2018
I-4700A_HYD_PRM_PSH_XPL
HNTB

8/17/99

HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License Num C-1554	PROJECT REFERENCE NO.	SHEET NO.
	I-4700	13
	R/W SHEET NO.	I-4700A-24
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

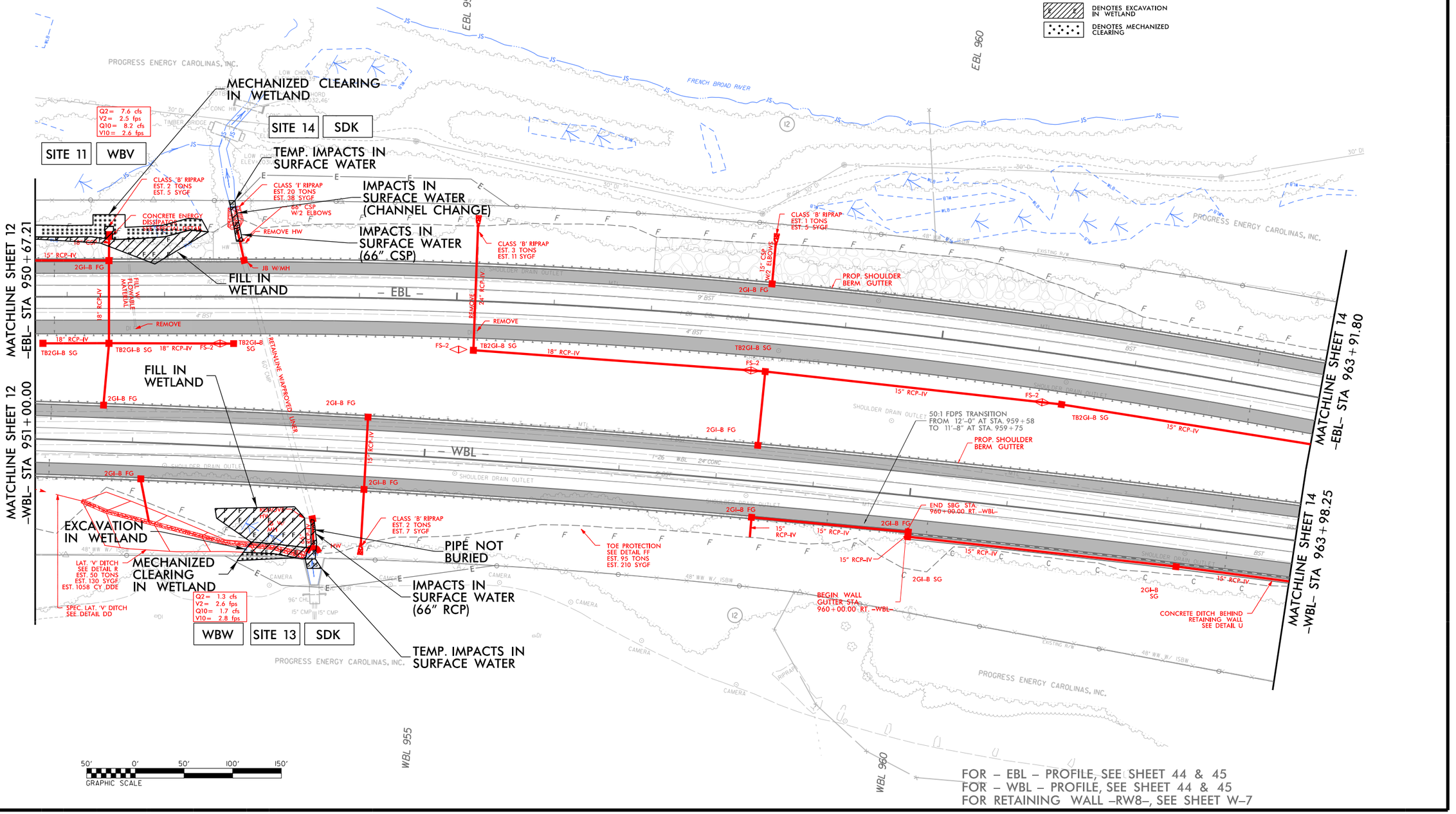
NAD 83

PERMIT DRAWING SHEET 27 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
- DENOTES MECHANIZED CLEARING



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

11/30/2018
I:\4700A_HYD_PRM_PSH_13.dgn
HNTB

8/17/99

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No. C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	13
R/W SHEET NO.	I-4700A-24
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83

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
- DENOTES MECHANIZED CLEARING

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

PROGRESS ENERGY CAROLINAS, INC.

FRENCH BROAD RIVER

EBL 955

EBL 960

WBL 955

WBL 960

MECHANIZED CLEARING IN WETLAND

SITE 14 SDK

SITE 11 WBV

WBW SITE 13 SDK

Q2= 7.6 cfs
V2= 2.5 fps
Q10= 8.2 cfs
V10= 2.6 fps

Q2= 1.3 cfs
V2= 2.6 fps
Q10= 1.7 cfs
V10= 2.8 fps

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

IMPACTS IN SURFACE WATER (66" CSP)

IMPACTS IN SURFACE WATER (66" RCP)

FILL IN WETLAND

EXCAVATION IN WETLAND

MECHANIZED CLEARING IN WETLAND

PIPE NOT BURIED

TEMP. IMPACTS IN SURFACE WATER

CLASS 'B' RIPRAP EST. 2 TONS EST. 5 SYGF

CLASS 'I' RIPRAP EST. 20 TONS EST. 38 SYGF

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

CLASS 'B' RIPRAP EST. 1 TONS EST. 5 SYGF

CLASS 'B' RIPRAP EST. 2 TONS EST. 7 SYGF

CONCRETE ENERGY DISSIPATOR

66" CSP W/2 ELBOWS

REMOVE HW

JB W/MH

REMOVE

15" RCP-IV

18" RCP-IV

24" RCP-IV

2GI-8 FG

TB2GI-B SG

FS-2

RETAINING WATERPROOF LINER

PROP. SHOULDER BERM GUTTER

50:1 FDPS TRANSITION FROM 12'-0" AT STA. 959+58 TO 11'-8" AT STA. 959+75

END SBG STA. 960+00.00 RT. –WBL–

BEGIN WALL GUTTER STA. 960+00.00 RT. –WBL–

TOE PROTECTION SEE DETAIL FF EST. 95 TONS EST. 210 SYGF

LAT. 'V' DITCH SEE DETAIL R EST. 50 TONS EST. 130 SYGF EST. 1058 CY DDE

SPEC. LAT. 'V' DITCH SEE DETAIL DD

CONCRETE DITCH BEHIND RETAINING WALL SEE DETAIL U

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

50' 0' 50' 100' 150'
GRAPHIC SCALE

11/30/2018
I-4700A_HYD_PRM_PSH_13.dgn
HNTB

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No. C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	13
R/W SHEET NO.	I-4700A-24
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83

PERMIT DRAWING SHEET 29 OF 97

SITE 11 | WBV

SITE 14 | SDK

TEMP. IMPACTS IN SURFACE WATER

MECHANIZED CLEARING IN WETLAND

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

CLASS 'I' RIPRAP
EST. 20 TONS
EST. 38 SYGF

66" CSP W/2 ELBOWS

IMPACTS IN SURFACE WATER (66" CSP)

REMOVE HW

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

18" CSP

JB W/MH

FILL IN WETLAND

FILL W/ FLOWABLE MATERIAL

18" RCP-IV

REMOVE

18" RCP-IV

18" RCP-IV

RETAINLINE W/APPROVED LINER

60" CMP

15" RCP-IV

951+00 952+00 953+00 954+00 — EBL —

4' BST

TIMBER BRIDGE

LOW CHORD ELEV=2031.64'

SHOULDER DRAIN OUTLET

952+00 953+00 954+00 955+00

FILL IN WETLAND

REMOVE HW

JB W/ MH

66" RCP-IV

EXCAVATION IN WETLAND

48" WW W/ ISBW

HW

PIPE NOT BURIED

CLASS 'B' RIPRAP
EST. 2 TONS
EST. 7 SYGF

IMPACTS IN SURFACE WATER (66" RCP)

TEMP. IMPACTS IN SURFACE WATER

LAT. 'V' DITCH
SEE DETAIL R
EST. 50 TONS
EST. 130 SYGF
EST. 1058 CY DDE

MECHANIZED CLEARING IN WETLAND

CAMERA

CAMERA

GAGE WEIR

WBW | SITE 13 | SDK

SPEC. LAT. 'V' DITCH
SEE DETAIL DD

15" CMP 15" CMP

LEGEND

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

50' 0' 50' 100' 150'

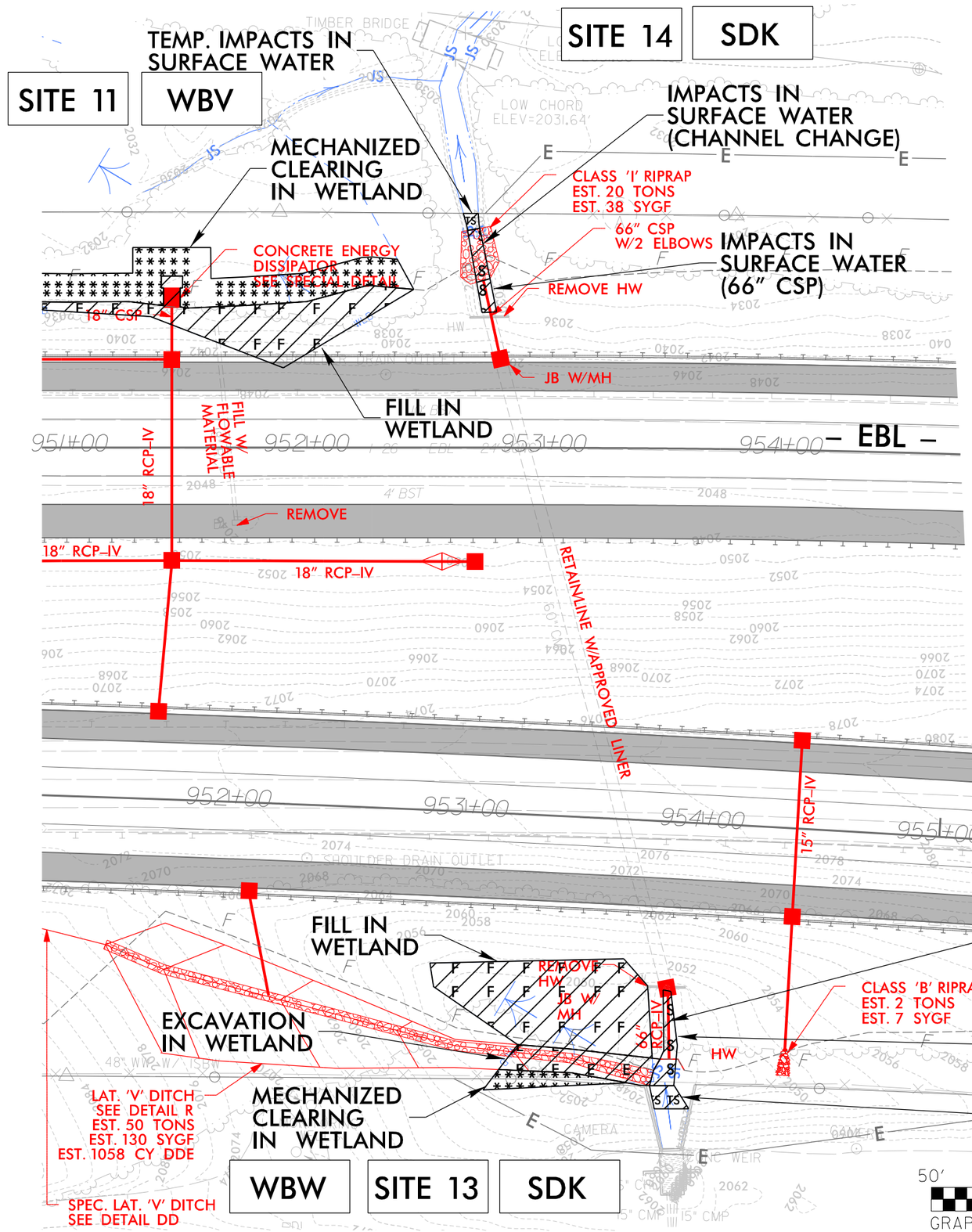
GRAPHIC SCALE

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No. C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	13
R/W SHEET NO.	I-4700A-24
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83

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
- DENOTES MECHANIZED CLEARING

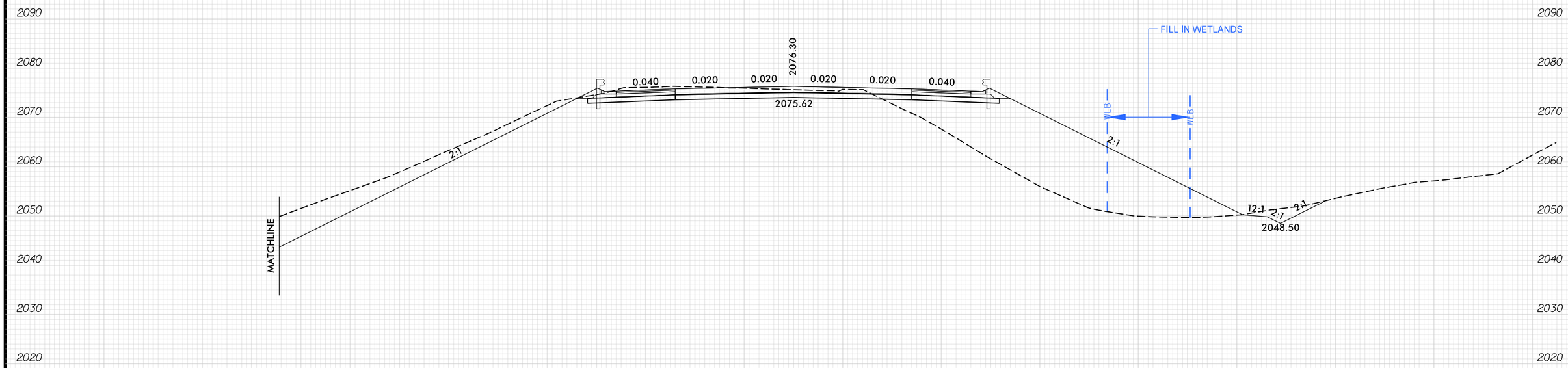
6/23/16

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.)

11/13/2018
I-4700A_HYD_PRM_PSH_XPL
HNTB

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 10

6/23/16

PROJ. REFERENCE NO.	SHEET NO.
I-4700	

PERMIT DRAWING
SHEET 32 OF 97

300 250 200 150 100 50 ℄ 50 100 150 200

2090 2080 2070 2060 2050 2040 2030

STA. 952+91.57 –EBL–
1 @ 66" RCP/CMP
℄ ELEV. = 2048.21'
SKEW = 74°58'4"

STA. 953+66.26 –WBL–
1 @ 66" RCP/CMP
℄ ELEV. = 2077.70
SKEW = 72°13'0"

2:1 NORMAL

2:1 NORMAL

WS EL. = 2041.8'
SURVEY 09–10–17

NATURAL GROUND RIGHT BANK

NATURAL GROUND

JB W/ MH

RETAIN & LINE EX. 66" CMP W/ APPROVED LINER

NATURAL GROUND LEFT BANK

INV. = 2042.1'

INV. = 2041.4'

EXTEND 66" CSP 2.53% GRADE

66" CONC. COLLAR

NATURAL GROUND RIGHT BANK

INV. = 2032.1'

EXTEND 66" CSP W/2 ELBOWS 49.95% GRADE

INV. = 2026.4'

EXTEND 66" CSP 3.44% GRADE

NATURAL GROUND LEFT BANK

NATURAL GROUND

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.)

11/13/2018
I-4700A_HYD_PRM_PSH_13C_PFL.dgn
HNTB

8/17/99

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343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No. C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	15
R/W SHEET NO.	I-4700A-26
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 33 OF 97

WETLAND & STREAM IMPACTS

NAD 83

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

EBL 980 | EBL 985 | EBL 990

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL KKKK

IMPACTS IN SURFACE WATER (2 @ 10' X 10' RCBC)

TEMP. IMPACTS IN SURFACE WATER

DOWNSTREAM CHANNEL IMPROVEMENTS

SITE 16 | SDN

CULVERT NOT BURIED

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

PROGRESS ENERGY CAROLINAS, INC.

RIVERLINK, INC

HOPE W. RYAN

HICKLIN HILL, LLC

CLASS 'B' RIPRAP EST. 1 TONS EST. 5 SYGF

FILL W/ FLOWABLE MATERIAL

SHOULDER DRAIN OUTLET

2GI-B FG | 2GI-B SG | TB2GI-B FG | TB2GI-B SG

15" RCP-IV | 18" RCP-IV

REMOVE | RETAIN

END SBG STA. 980+00.00 LT. –WBL–

EXTEND 2@ 10' X 10' RCBC

2 BARREL 10'x10' CONC BOX CULVERT (#1)

CLASS 'I' RIPRAP EST. 15 TONS EST. 30 SYGF

END SBG STA. 989+00.00 LT. –EBL–

RETAINING WALL APPROVED LINER

END SBG STA. 986+00.00 RT. –WBL–

JB W/MH

36" RCP-IV

HW

2' LAT. BASE DITCH SEE DETAIL JJ EST. 95 SYGF EST. 856 CY DDE

SPEC. LAT. 'V' DITCH SEE DETAIL GG

BERM DITCH SEE DETAIL B EST. 100 SYGF

END WALL GUTTER BEGIN SBG STA. 980+00.00 RT. –WBL–

50:1 FDPS TRANSITION FROM 11'-8" AT STA. 980+25 TO 12'-0" AT STA. 980+42

PROP. GATE

EXISTING ACCESS POINT FOR CAROLINA POWER AND LIGHT REF. DB 894 PG 175

UPSTREAM CHANNEL IMPROVEMENTS SEE DETAIL JJJJ

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL JJJJ

SITE 15 | SDN

TEMP. IMPACTS IN SURFACE WATER

POWELL CREEK

WBL 980 | WBL 985 | WBL 990

GRAPHIC SCALE 50' 0' 50' 100' 150'

11/30/2018
I-4700A_HYD_PRM_PSH_15.dgn
HNTB

8/17/99

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No. C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	15
R/W SHEET NO.	I-4700A-26
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 34 OF 97

WETLAND & STREAM IMPACTS

NAD 83

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

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL KKKK

IMPACTS IN SURFACE WATER (2 @ 10' X 10' RCBC)

TEMP. IMPACTS IN SURFACE WATER

CULVERT NOT BURIED

IMPACTS IN SURFACE WATER (2 @ 10' X 10' RCBC)

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL JJJJ

CULVERT NOT BURIED

TEMP. IMPACTS IN SURFACE WATER

POWELL CREEK

SITE 16 | SDN

SITE 15 | SDN

EBL 980 | EBL 985 | EBL 990

WBL 980 | WBL 985 | WBL 990

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

PROGRESS ENERGY CAROLINAS, INC.

RIVERLINK, INC

HOPE W. RYAN

HICKLIN HILL, LLC

DOWNSTREAM CHANNEL IMPROVEMENTS

UPSTREAM CHANNEL IMPROVEMENTS SEE DETAIL JJJJ

EXTEND 2@ 10' X 10' RCBC

EXTEND 2@ 10' X 10' RCBC W/ 6" TOP BEVEL

CLASS 'B' RIPRAP EST. 1 TONS EST. 5 SYGF

CLASS 'I' RIPRAP EST. 15 TONS EST. 30 SYGF

FILL W/ FLOWABLE MATERIAL

END SBG STA. 980+00.00 LT. –WBL–

END SBG STA. 989+00.00 LT. –EBL–

END SBG STA. 986+00.00 RT. –WBL–

END WALL GUTTER BEGIN SBG STA. 980+00.00 RT. –WBL–

50:1 FDPS TRANSITION FROM 11'–8" AT STA. 980+25 TO 12'–0" AT STA. 980+42

2' LAT. BASE DITCH SEE DETAIL JJ EST. 95 SYGF EST. 856 CY DDE

SPEC. LAT. 'V' DITCH SEE DETAIL GG

BERM DITCH SEE DETAIL B EST. 100 SYGF

JB W/MH

36" RCP–IV

HW

RETAINING WALL APPROVED LINER

PROP. GATE

N 20° 31' 17.5" W

N 23° 31' 01.2" W

GRAPHIC SCALE 50' 0' 50' 100' 150'

11/30/2018
I-4700A_HYD_PRM_PSH_15.dgn
HNTB

HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License Num C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 35 OF 97

NAD 83

DOWNSTREAM CHANNEL IMPROVEMENTS

SITE 16 | **SDN**

TEMP. IMPACTS IN SURFACE WATER

CULVERT NOT BURIED

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL KKKK

CLASS 'B' RIPRAP EST. 1 TONS EST. 5 SYGF

EXTEND 2@ 10' X 10' RCBC

IMPACTS IN SURFACE WATER (2 @ 10' X 10' RCBC)

2GI-B FG

REMOVE 15" RCP-IV

RETAIN

2GI-B SG

2GI-B FG

REMOVE 15" RCP-IV

2GI-B FG

TB2GI-B FG

983+00 984+00 985+00 986+00 987+00

2GI-B FG 15" RCP-IV 2GI-B FG

IMPACTS IN SURFACE WATER (2 @ 10' X 10' RCBC)

END SBG STA. 986+00.00 RT. -WBL-

EXTEND 2@ 10' X 10' RCBC W/6" TOP BEVEL

CULVERT NOT BURIED

2' LAT. BASE DITCH SEE DETAIL JJ EST. 95 SYGF EST. 856 CY DDE

PROP. GATE

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL JJJJ

TEMP. IMPACTS IN SURFACE WATER

UPSTREAM CHANNEL IMPROVEMENTS SEE DETAIL JJJJ

SITE 15 | **SDN**

POWELL CREEK

LEGEND

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50' 0' 50' 100' 150'

GRAPHIC SCALE

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No. C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	15
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 36 OF 97

NAD 83

DOWNSTREAM CHANNEL IMPROVEMENTS

SITE 16 | SDN

TEMP. IMPACTS IN SURFACE WATER

CULVERT NOT BURIED

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL KKKK

CLASS 'B' RIPRAP
EST. 1 TONS
EST. 5 SYGF

EXTEND 2@ 10' X 10' RCBC

IMPACTS IN SURFACE WATER (2 @ 10' X 10' RCBC)

2GI-B FG
15" RCP-IV
2GI-B SG
REMOVE
RETAIN
2GI-B FG
TB2GI-B FG

983+00 984+00 985+00 986+00 987+00

EXTEND 2@ 10' X 10' RCBC W/6" TOP BEVEL

IMPACTS IN SURFACE WATER (2 @ 10' X 10' RCBC)

END SBG STA. 986+00.00 RT. –WBL–

2' LAT. BASE DITCH
SEE DETAIL JJ
EST. 95 SYGF
EST. 856 CY DDE

CULVERT NOT BURIED

PROP. GATE

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL JJJJ

UPSTREAM CHANNEL IMPROVEMENTS SEE DETAIL JJJJ

SITE 15 | SDN

POWELL CREEK

LEGEND

S S — DENOTES IMPACTS IN SURFACE WATER

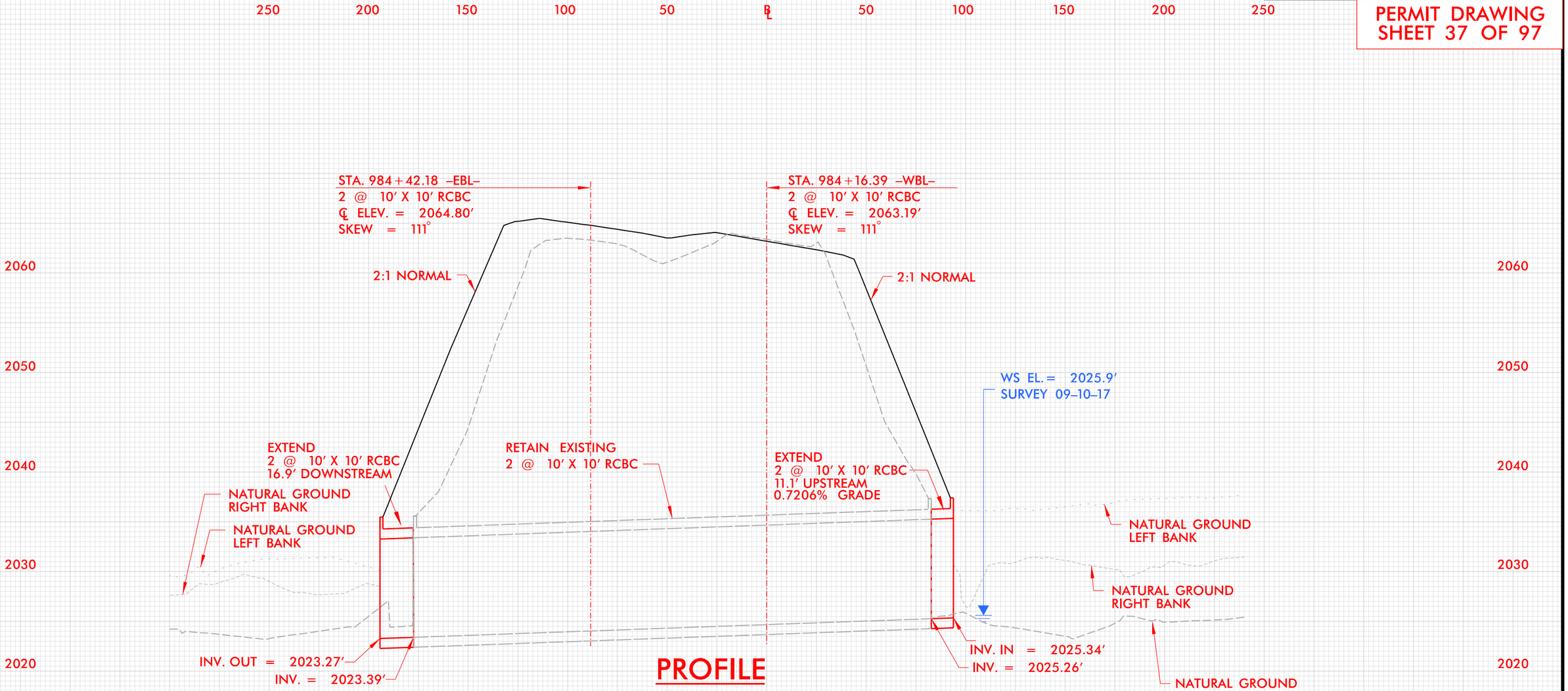
TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50' 0' 50' 100' 150'
GRAPHIC SCALE

6/23/16

PROJ. REFERENCE NO.	SHEET NO.
I-4700	

PERMIT DRAWING
SHEET 37 OF 97



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.)

11/30/2018
I-4700A_HYD_PRM_PSH_15B_PFL.dgn
HNTB

8/17/99

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License Num C-1554

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

PERMIT DRAWING
SHEET 38 OF 97

WETLAND & STREAM IMPACTS

NAD 83

THE AVENTINE ASHEVILLE, LLC

SITE 18A
FRENCH BROAD RIVER

BILTMORE FARMS, LLC

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

BACKFILL BENEATH EXISTING WINGWALL AND PROTECT WITH CL "VII" RIPRAP

CLASS "VII" RIPRAP
EST. 94 TONS
EST. 44 SYGF
(REMOVE EXISTING CONCRETE RIPRAP & FILL SCOUR HOLE TO BARREL INVERT)

REPLACE WINGWALL (SAW-CUT & DOWEL)
AVOID DISTURBANCE OF 8" DI PIPE SANITARY
(8" DI SANITARY IS INTERNAL THROUGH THE RCB & THEN AERIAL W/FOOTINGS OUTSIDE THE RCB)

LEGEND

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SITE 18 SDU

TEMP. IMPACTS IN SURFACE WATER

PIPE NOT BURIED

CLASS 'I' RIPRAP
EST. 10 TONS
EST. 24 SYGF
(FILL EXISTING SCOUR HOLE)

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

48" RCP-IV
JB W/MH

48" WELDED STEEL PIPE
.625" WALL THICKNESS
TRENCHLESS INSTALLATION

BEGIN SBG STA.
17+00.00 RT. -Y15RPA-

A

S 36° 34' 14" E

END 2'-6" C&G
STA. 1022+00.00 LT. -L-

CLASS 'B' RIPRAP
EST. 2 TONS
EST. 7 SYGF

MATCHLINE SHEET 17
-L- STA 1017+00.00

MATCHLINE SHEET 19
-L- STA 1029+00.00

N 44° 30' 32.3" W

D

S 63° 48' 54.5" E

BEGIN SBG STA.
1026+50.00 RT. -L-

IMPACTS IN SURFACE WATER (48" RCP)

PIPE NOT BURIED

IMPACTS IN SURFACE WATER (BANK STABILIZATION)

TEMP. IMPACTS IN SURFACE WATER

SITE 17 SDU

DUCKER CREEK

BEGIN EXPRESSWAY GUTTER
STA. 12+10.00
-Y15RPD- 12.00' RT.

END EXPRESSWAY GUTTER
STA. 14+10.00
-Y15RPD- 12.00' RT.

STATE OF NORTH CAROLINA CONSERVATION EASEMENT

TOWN SQUARE WEST, LLC

BILTMORE PARK HOTEL

BILTMORE FARMS, LLC
DB 1222 PG 645

50' 0' 50' 100' 150'
GRAPHIC SCALE

FOR -L- PROFILE, SEE SHEET 48 & 49
FOR -Y15RPA- PROFILE, SEE SHEET 66
FOR -Y15RPD- PROFILE, SEE SHEET 68

11/30/2018
I-4700A_HYD_PRM_PSH_18.dgn
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8/17/99

HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No. C-1554

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

PERMIT DRAWING
SHEET 39 OF 97

WETLAND & STREAM IMPACTS

NAD 83

SITE 18A
FRENCH BROAD RIVER

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

BACKFILL BENEATH EXISTING WINGWALL AND PROTECT WITH CL "VII" RIPRAP

CLASS "VII" RIPRAP
EST. 94 TONS
EST. 44 SYGF
(REMOVE EXISTING CONCRETE RIPRAP & FILL SCOUR HOLE TO BARREL INVERT)

REPLACE WINGWALL (SAW-CUT & DOWEL)
AVOID DISTURBANCE OF 8" DI PIPE SANITARY
(8" DI SANITARY IS INTERNAL THROUGH THE RCB & THEN AERIAL W/FOOTINGS OUTSIDE THE RCB)

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

SITE 18 SDU

TEMP. IMPACTS IN SURFACE WATER

PIPE NOT BURIED

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

CLASS "I" RIPRAP
EST. 10 TONS
EST. 24 SYGF
(FILL EXISTING SCOUR HOLE)

48" RCP-IV
JB W/MH

48" WELDED STEEL PIPE
.625" WALL THICKNESS
TRENCHLESS INSTALLATION

BEGIN SBG STA. 17+00.00 RT. -Y15RPA-

END 2'-6" C&G
STA. 1022+00.00 LT. -L-

CLASS 'B' RIPRAP
EST. 2 TONS
EST. 7 SYGF

MATCHLINE SHEET 17
-L- STA 1017+00.00

MATCHLINE SHEET 19
-L- STA 1029+00.00

PIPE NOT BURIED

IMPACTS IN SURFACE WATER (48" RCP)

IMPACTS IN SURFACE WATER (BANK STABILIZATION)

TEMP. IMPACTS IN SURFACE WATER

SITE 17 SDU

DUCKER CREEK

BEGIN EXPRESSWAY GUTTER
STA. 12+10.00
-Y15RPD- 12.00' RT.

END EXPRESSWAY GUTTER
STA. 14+10.00
-Y15RPD- 12.00' RT.

BEGIN SBG STA. 1026+50.00 RT. -L-

RETAIN & CONNECT EX PIPE TO PROP 2GI

STATE OF NORTH CAROLINA CONSERVATION EASEMENT

50' 0' 50' 100' 150'
GRAPHIC SCALE

FOR -L- PROFILE, SEE SHEET 48 & 49
FOR -Y15RPA- PROFILE, SEE SHEET 66
FOR -Y15RPD- PROFILE, SEE SHEET 68

11/30/2018
I-4700A_HYD_PRM_PSH_18.dgn
HNTB

HNTB NORTH CAROLINA, P.C.

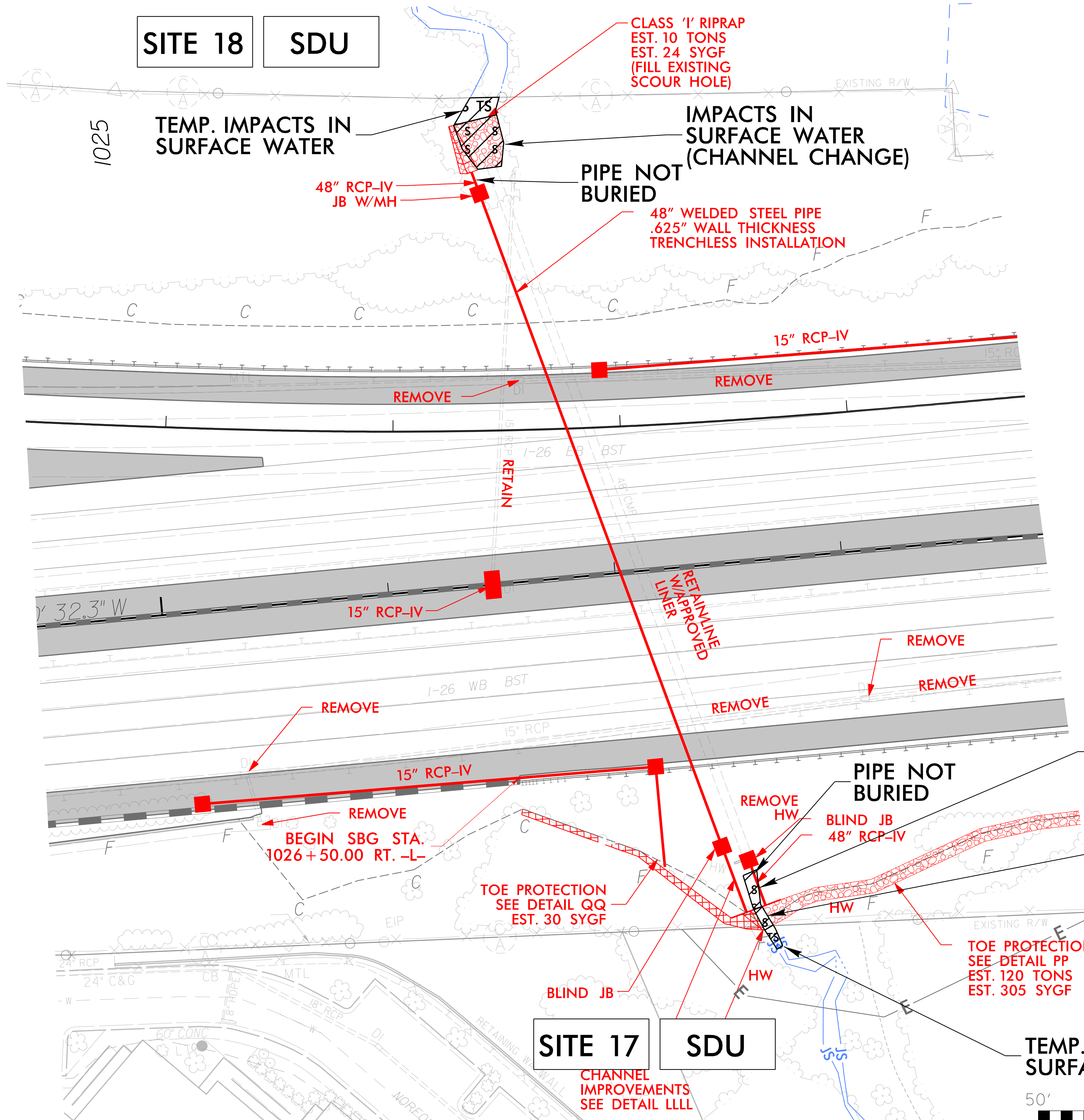
PROJECT REFERENCE NO.	SHEET NO.
I-4700	18
R/W SHEET NO.	I-4700A-28
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83

PERMIT DRAWING SHEET 40 OF 97

LEGEND

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



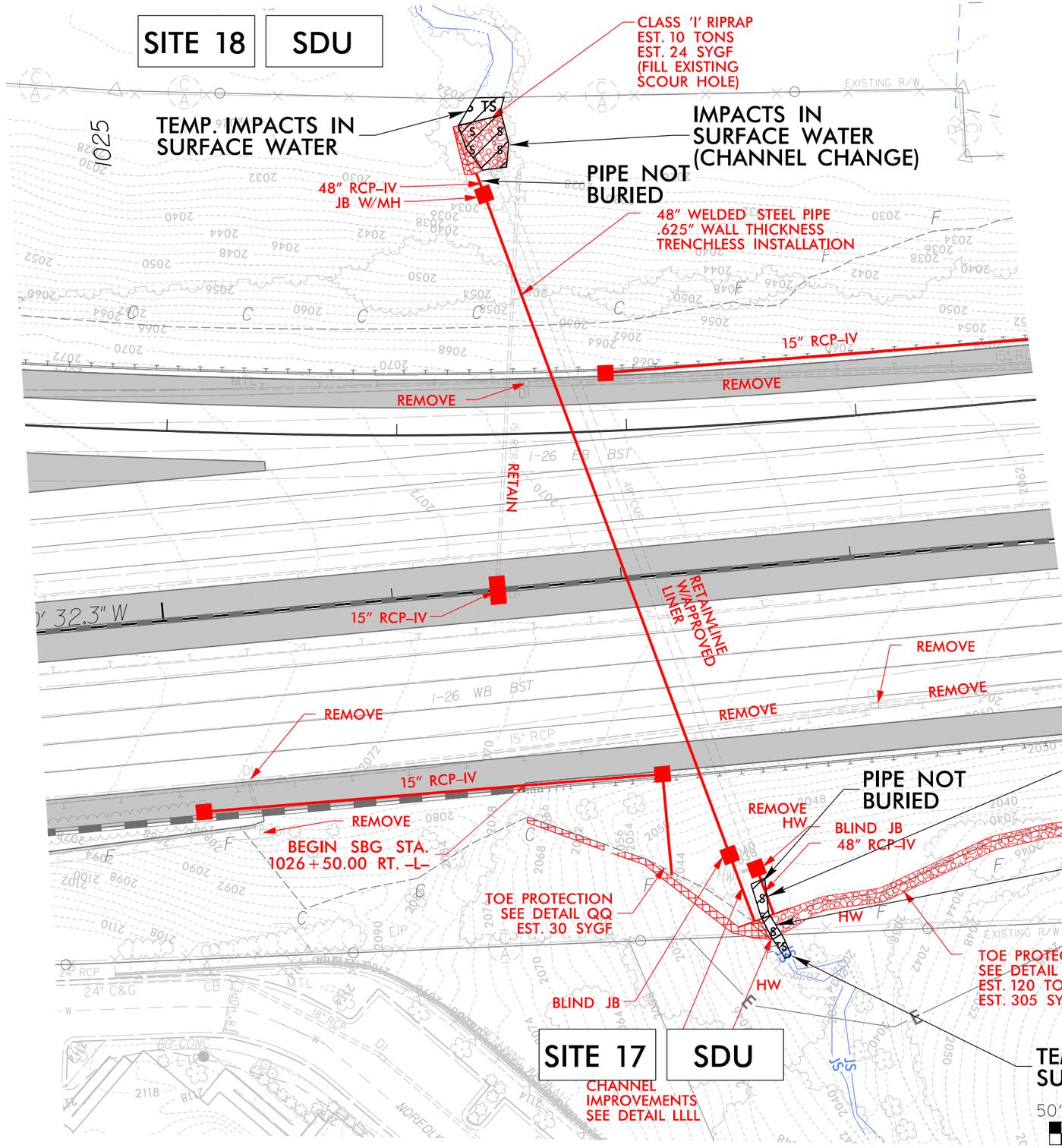
50' 0' 50' 100' 150'
GRAPHIC SCALE

8/17/99
11/30/2018
I-4700A_HYD_PRM_PSH_18A.dgn

8/17/99

HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License Num C-1554	PROJECT REFERENCE NO.	SHEET NO.
	I-4700	18
	R/W SHEET NO.	I-4700A-28
NAD 83	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 41 OF 97



LEGEND

- S S — DENOTES IMPACTS IN SURFACE WATER
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

11/30/2018
I:\I-4700A_HYD_PRM_PSH_18A.dgn
HNTB

8/17/99

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No. C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	19
R/W SHEET NO.	I-4700A-29
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 42 OF 97

WETLAND & STREAM IMPACTS

NAD 83

LEGEND
- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING

SITE 19 | WCH

MECHANIZED CLEARING IN WETLAND

FILL IN WETLAND

FILL IN WETLAND

MECHANIZED CLEARING IN WETLAND

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

CLASS 'B' RIPRAP EST. 2 TONS EST. 5 SYGF

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

CLASS 'B' RIPRAP EST. 2 TONS EST. 5 SYGF

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

MATCHLINE SHEET 18 –L– STA 1029+00.00

MATCHLINE SHEET 20 –L– STA 1042+00.00

TOE PROTECTION SEE DETAIL PP EST. 120 TONS EST. 305 SYGF

BERM DITCH SEE DETAIL D

CLASS 'B' RIPRAP EST. 3 TONS EST. 10 SYGF

CLASS 'B' RIPRAP EST. 3 TONS EST. 10 SYGF

FILL W/ FLOWABLE MATERIAL

FILL W/ FLOWABLE MATERIAL

PROP. SHOULDER BERM GUTTER

REMOVE

END SBG STA. 1033+00.00 LT. –L–

BDO

BILTMORE FARMS, INC.

BILTMORE FARMS, LLC

50' 0' 50' 100' 150'
GRAPHIC SCALE

FOR – L – PROFILE, SEE SHEET 49

12/3/2018
I:\4700A_HYD_PRM_PSH_19.dgn
HNTB

8/17/99

HNTB NORTH CAROLINA, P.C.
343 Fayetteville Street, Suite 200
Raleigh, North Carolina 27601
NC License No. C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	19
R/W SHEET NO.	I-4700A-29
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 43 OF 97

WETLAND & STREAM IMPACTS

NAD 83

LEGEND
- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING

MECHANIZED CLEARING IN WETLAND

SITE 19 | WCH

FILL IN WETLAND

MECHANIZED CLEARING IN WETLAND

FILL IN WETLAND

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

CLASS 'B' RIPRAP EST. 2 TONS EST. 5 SYGF

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

CLASS 'B' RIPRAP EST. 2 TONS EST. 5 SYGF

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

MATCHLINE SHEET 18
–L– STA 1029+00.00

MATCHLINE SHEET 20
–L– STA 1042+00.00

REMOVE
15" RCP-IV
TB2GI-B FG
2GI-B FG
END SBG STA. 1033+00.00 LT. –L–
24" CSP
24" RCP-IV
TB2GI-A FG
2GI-B SG
18" CSP W/1 ELBOW
FS-3
FILL W/ FLOWABLE MATERIAL
PROP. SHOULDER BERM GUTTER

TOE PROTECTION SEE DETAIL PP EST. 120 TONS EST. 303 SYGF

BERM DITCH SEE DETAIL D

BDO

BILTMORE FARMS, INC.

BILTMORE FARMS, LLC

50' 0' 50' 100' 150'
GRAPHIC SCALE

FOR – L – PROFILE, SEE SHEET 49

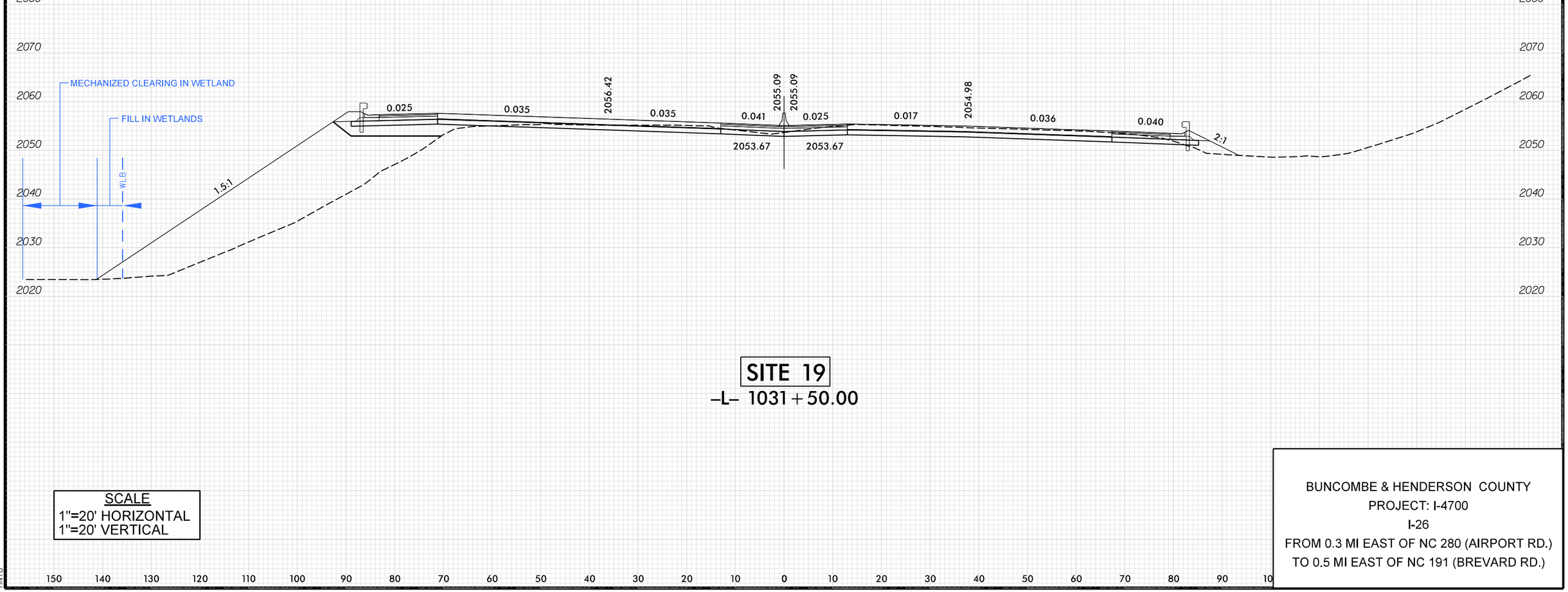
12/3/2008
I:\14700A_HYD_PRM_PSH_19.dgn
HNTB

6/23/16

PROJ. REFERENCE NO.	SHEET NO.
I-4700	

PERMIT DRAWING
SHEET 44 OF 97

WETLAND CROSS SECTIONS



SITE 19

–L– 1031+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.)

11/30/2018
I-4700A_HYD_PRM_PSH_XPL
HNTB

8/17/99

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No. C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	20
R/W SHEET NO.	I-4700A-30
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

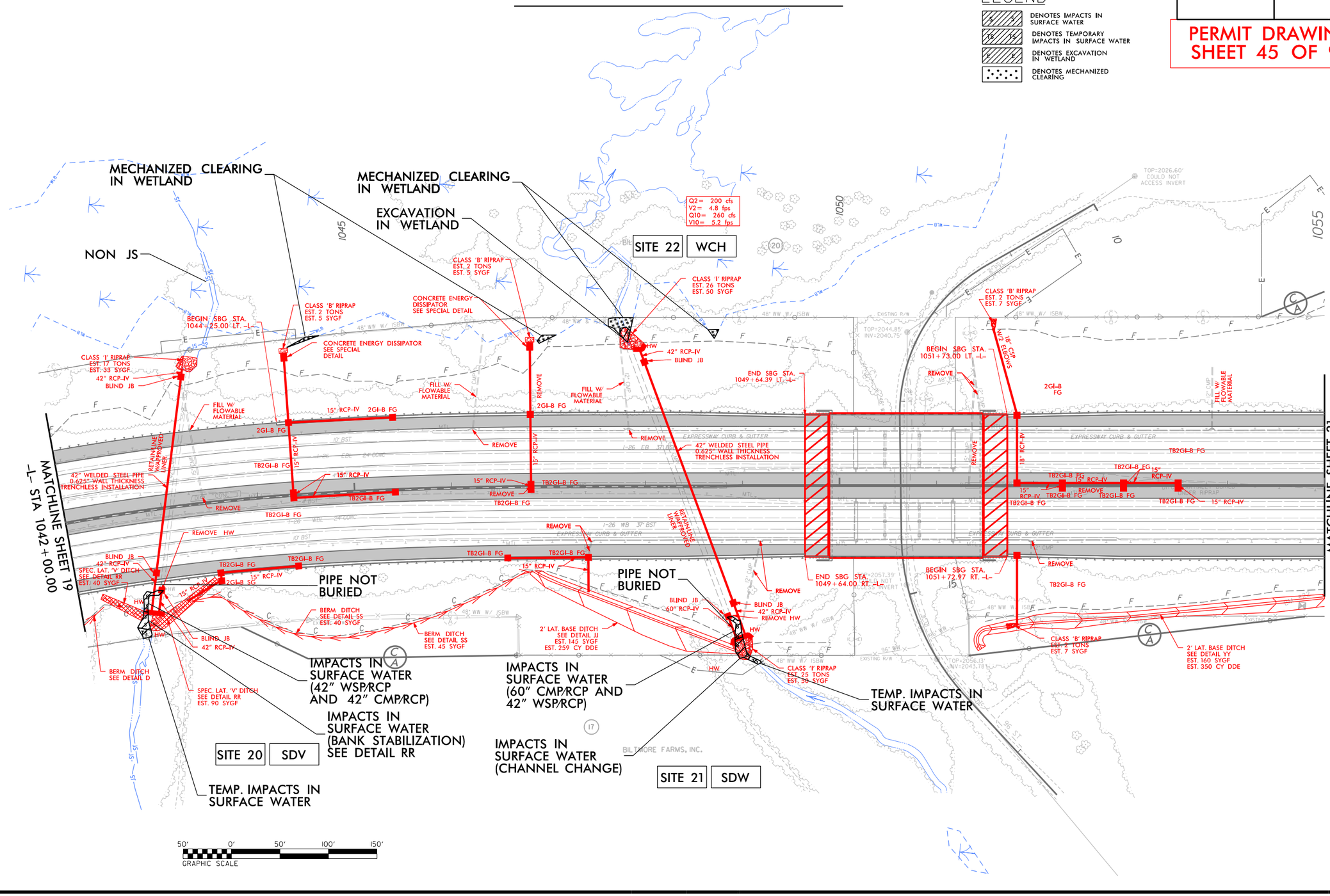
NAD 83

PERMIT DRAWING SHEET 45 OF 97

WETLAND & STREAM IMPACTS

LEGEND

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



12/3/2018
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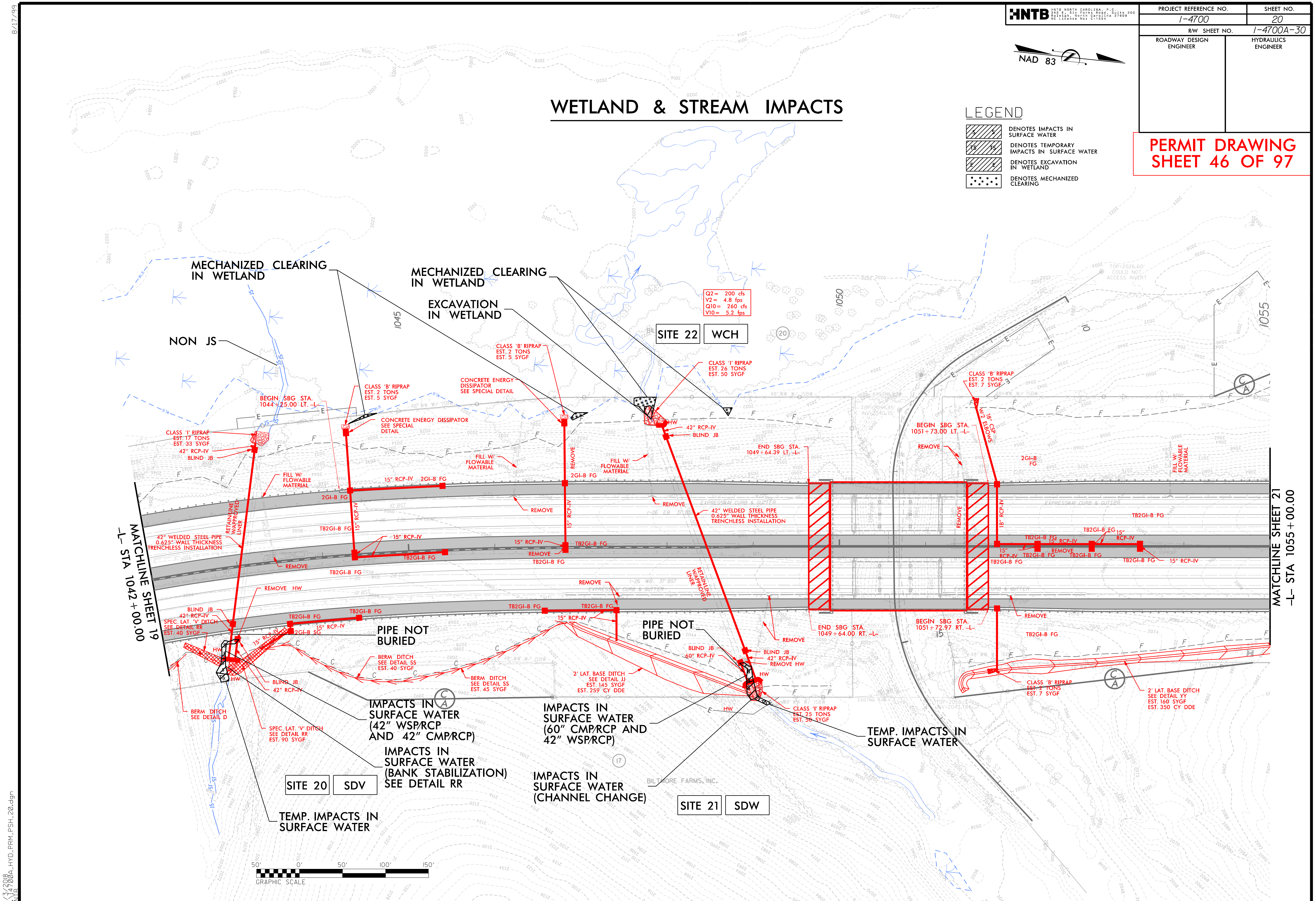
HNTB


HNTB
PROJECT REFERENCE NO. I-4700
SHEET NO. 20
R/W SHEET NO. I-4700A-30
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PERMIT DRAWING SHEET 46 OF 97
NAD 83
WETLAND & STREAM IMPACTS
LEGEND
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES EXCAVATION IN WETLAND
DENOTES MECHANIZED CLEARING
MECHANIZED CLEARING IN WETLAND
MECHANIZED CLEARING IN WETLAND
EXCAVATION IN WETLAND
NON JS
SITE 22
WCH
Q2= 200 cfs
V2= 4.8 fps
Q10= 260 cfs
V10= 5.2 fps
CLASS 'B' RIPRAP EST. 2 TONS EST. 5 SYGF
CLASS 'I' RIPRAP EST. 26 TONS EST. 50 SYGF
CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL
CLASS 'B' RIPRAP EST. 2 TONS EST. 5 SYGF
BEGIN SBG STA. 1044+25.00 LT. -L-
CLASS 'I' RIPRAP EST. 17 TONS EST. 33 SYGF
42" RCP-IV
BLIND JB
CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL
FILL W/ FLOWABLE MATERIAL
END SBG STA. 1049+64.39 LT. -L-
BEGIN SBG STA. 1051+73.00 LT. -L-
CLASS 'B' RIPRAP EST. 2 TONS EST. 7 SYGF
42" WELDED STEEL PIPE 0.625" WALL THICKNESS TRENCHLESS INSTALLATION
MATCHLINE SHEET 19 -L- STA 1042+00.00
MATCHLINE SHEET 21 -L- STA 1055+00.00
END SBG STA. 1049+64.00 RT. -L-
BEGIN SBG STA. 1051+72.97 RT. -L-
PIPE NOT BURIED
PIPE NOT BURIED
BERM DITCH SEE DETAIL SS EST. 40 SYGF
BERM DITCH SEE DETAIL SS EST. 45 SYGF
2' LAT. BASE DITCH SEE DETAIL JJ EST. 145 SYGF EST. 259 CY DDE
CLASS 'I' RIPRAP EST. 25 TONS EST. 50 SYGF
CLASS 'B' RIPRAP EST. 2 TONS EST. 7 SYGF
2' LAT. BASE DITCH SEE DETAIL YY EST. 160 SYGF EST. 350 CY DDE
SPEC. LAT. 'V' DITCH SEE DETAIL RR EST. 40 SYGF
SPEC. LAT. 'V' DITCH SEE DETAIL RR EST. 90 SYGF
BERM DITCH SEE DETAIL D
IMPACTS IN SURFACE WATER (42" WSP/RCP AND 42" CMP/RCP)
IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL RR
SITE 20
SDV
TEMP. IMPACTS IN SURFACE WATER
IMPACTS IN SURFACE WATER (60" CMP/RCP AND 42" WSP/RCP)
IMPACTS IN SURFACE WATER (CHANNEL CHANGE)
SITE 21
SDW
TEMP. IMPACTS IN SURFACE WATER
BILTMORE FARMS, INC.
GRAPHIC SCALE
50' 0' 50' 100' 150'
8/17/99
12/3/2018
I4700A_HYD_PRM_PSH_20.dgn

HNTB NORTH CAROLINA, P.C.
343 Fayetteville Street, Suite 200
Raleigh, North Carolina 27601
NC License No. C-1554

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

PERMIT DRAWING SHEET 47 OF 97

LEGEND

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

NAD 83

SITE 20 — SDV

PIPE NOT BURIED
REMOVE HW
BLIND JB
42" RCP–IV
SPEC. LAT. 'V' DITCH
SEE DETAIL RR
EST. 40 SYGF
TB2GI–B
2GI–B
15" RCP–IV
HW
BLIND JB
42" RCP–IV
BERM DITCH
IMPACTS IN SURFACE WATER (42" WSP/RCP AND 42" CMP/RCP)
IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL RR
TEMP. IMPACTS IN SURFACE WATER

SITE 22 — WCH

EXCAVATION IN WETLAND
CLASS 'I' RIPRAP
EST. 26 TONS
EST. 50 SYGF
48" WW W/ ISBW
HW
42" RCP–IV
BLIND JB
EXCAVATION IN WETLAND
REMOVE
15" RCP–IV
FILL W/ FLOWABLE MATERIAL
12" CMP
END SBG STA. 1049+64.39 LT, –L–
REMOVE
EXPRESSWAY CURB & GUTTER
I-26 EB 37' BST
42" WELDED STEEL PIPE
0.625" WALL THICKNESS
TRENCHLESS INSTALLATION
1047+00
1048+00
1049+00
1050+00
REMOVE
I-26 WB 37' BST
EXPRESSWAY CURB & GUTTER
RETAIN LINE W/APPROVED LINER
15" RCP–IV
PIPE NOT BURIED
BLIND JB
60" RCP–IV
2' LAT. BASE DITCH
SEE DETAIL JJ
EST. 145 SYGF
EST. 259 CY DDE
HW
REMOVE
BLIND JB
42" RCP–IV
REMOVE HW
HW
CLASS 'I' RIPRAP
EST. 25 TONS
EST. 50 SYGF
IMPACTS IN SURFACE WATER (60" CMP/RCP AND 42" WSP/RCP)
IMPACTS IN SURFACE WATER (CHANNEL CHANGE)
TEMP. IMPACTS IN SURFACE WATER

SITE 21 — SDW

50' 0' 50' 100' 150'
GRAPHIC SCALE

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No. C-1554

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

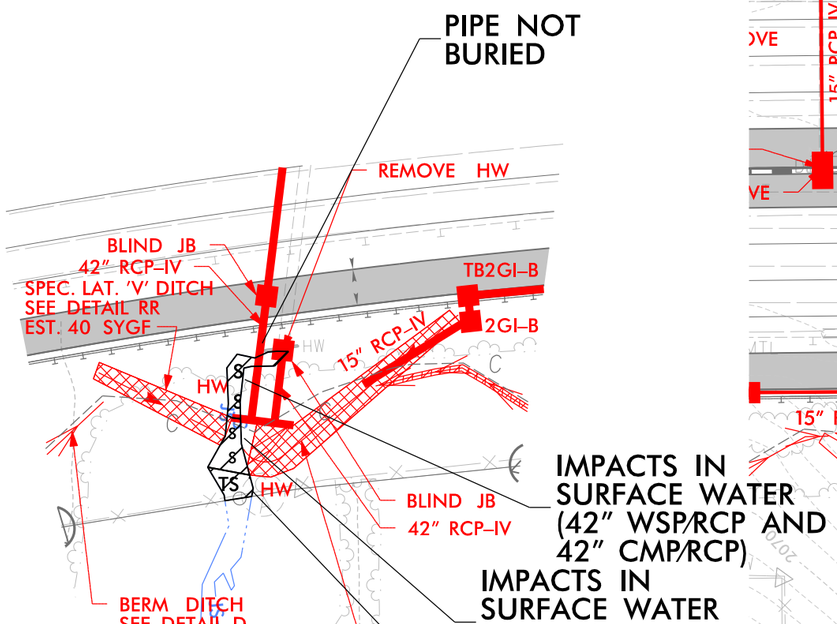
PERMIT DRAWING SHEET 48 OF 97

LEGEND

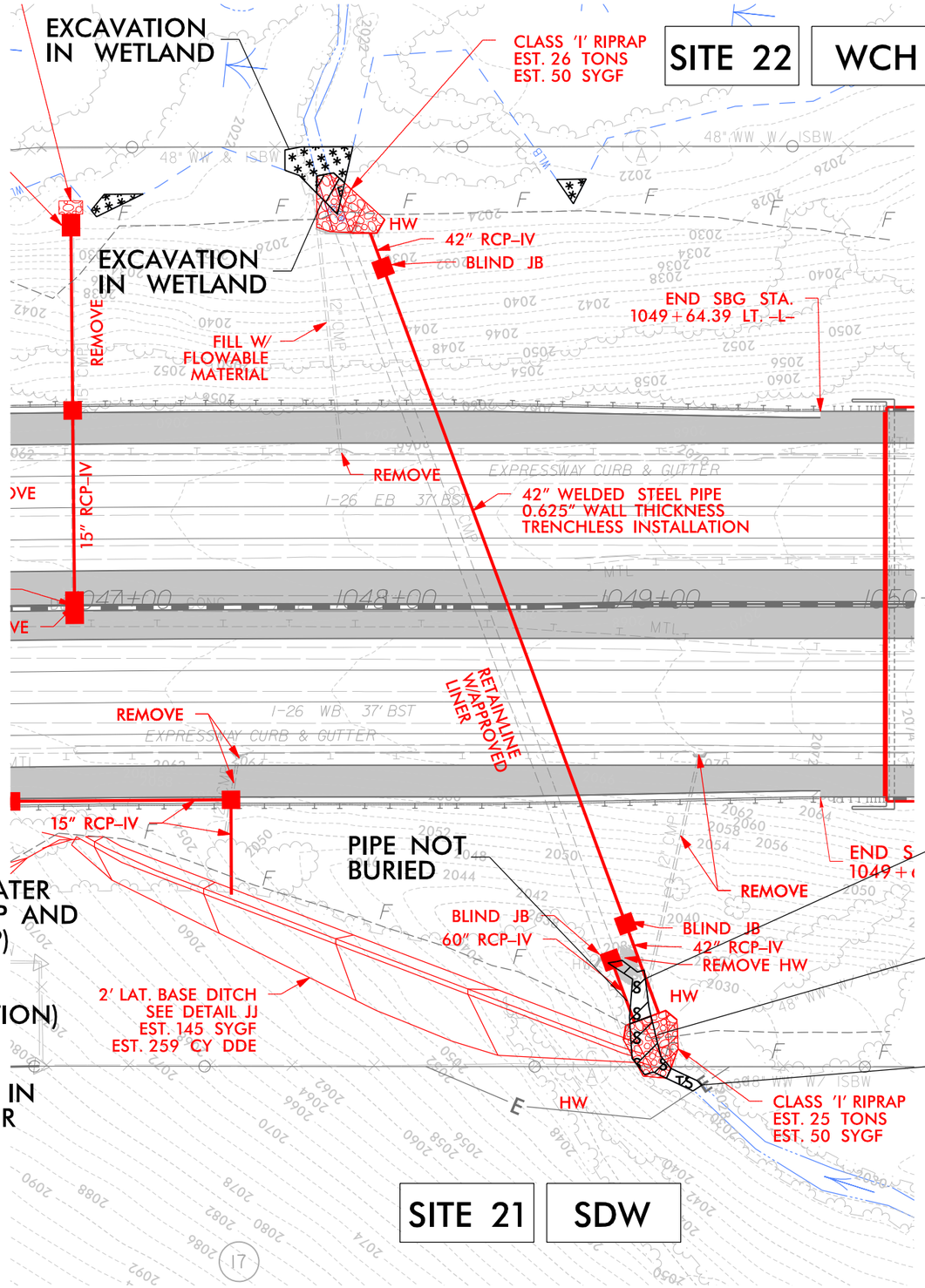
- S S — DENOTES IMPACTS IN SURFACE WATER
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- E E — DENOTES EXCAVATION IN WETLAND
- DENOTES MECHANIZED CLEARING

NAD 83

SITE 20 SDV



SITE 21 SDW



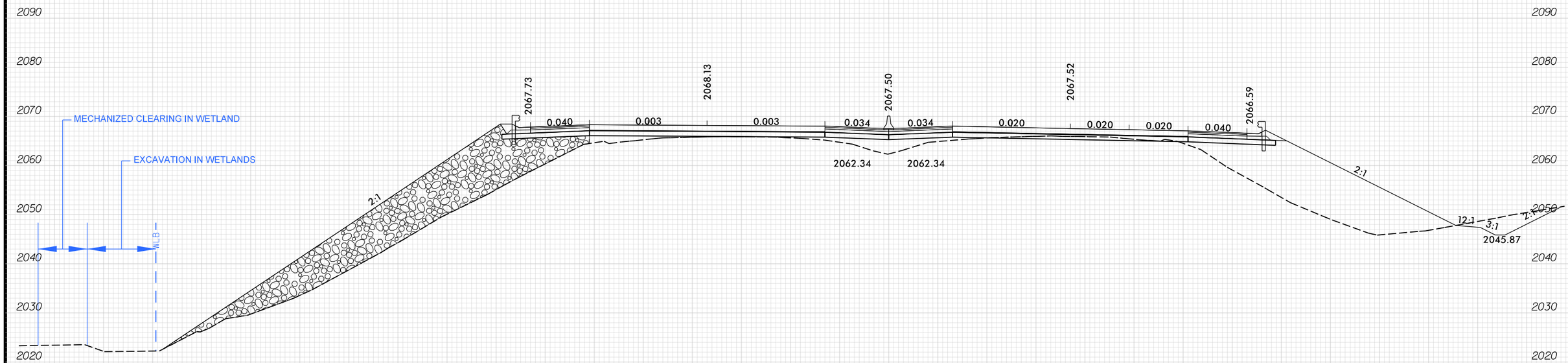
50′ 0′ 50′ 100′ 150′
GRAPHIC SCALE

6/23/16

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

PERMIT DRAWING
SHEET 49 OF 97

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.)

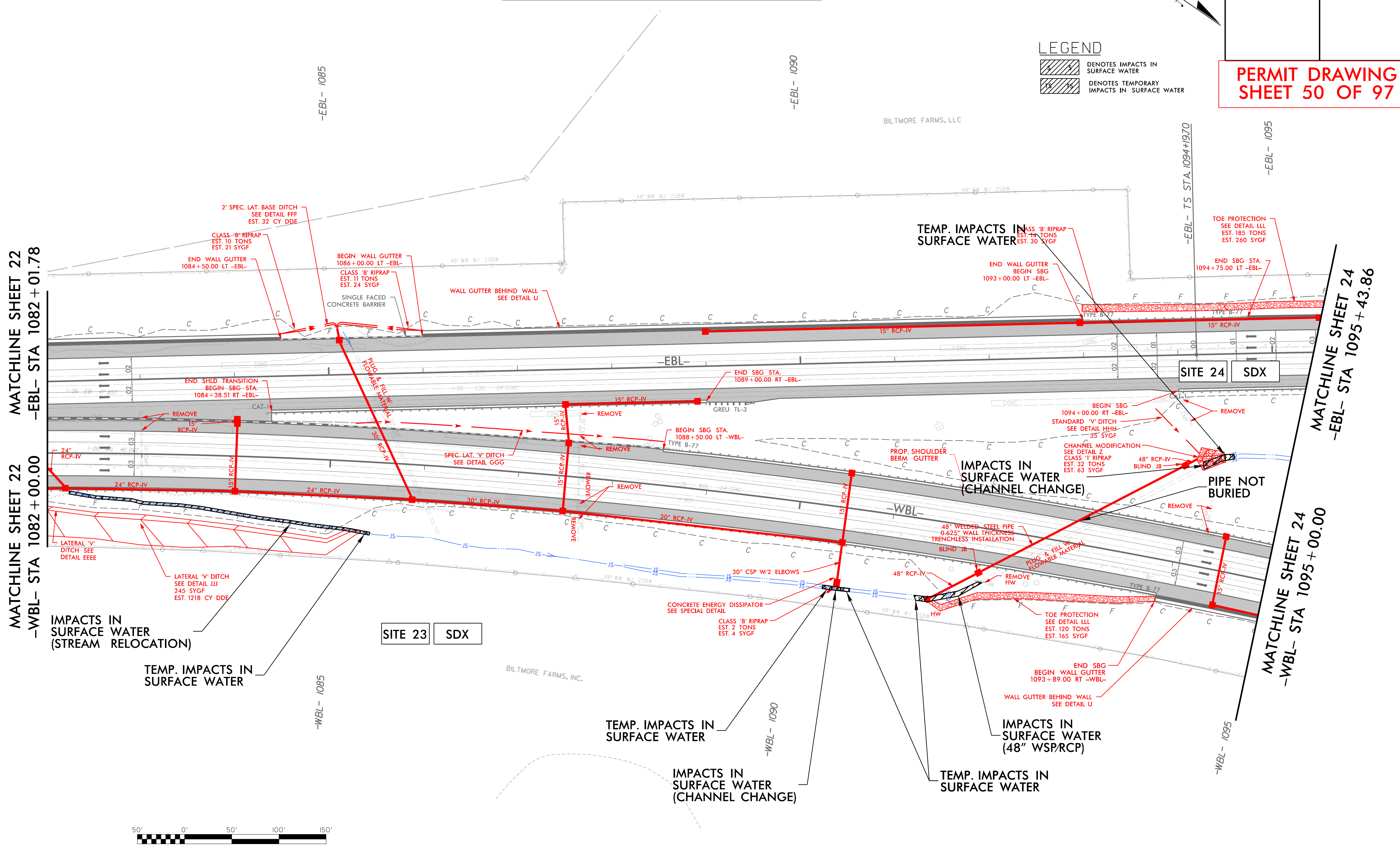
11/30/2018
I-4700A_HYD_PRM_PSH_XPL
HNTB

HNTB NORTH CAROLINA, P.C.

PROJECT REFERENCE NO.	SHEET NO.
I-4700	23
R/W SHEET NO.	I-4700B-33
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

WETLAND & STREAM IMPACTS

PERMIT DRAWING
SHEET 50 OF 97



NAD 83
LEGEND
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
-EBL- 1085
-EBL- 1090
-EBL- 1095
BILTMORE FARMS, LLC
BILTMORE FARMS, INC.
-EBL- TS STA. 1094+19.70
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
2' SPEC. LAT. BASE DITCH SEE DETAIL FFF EST. 32 CY DDE
CLASS 'B' RIPRAP EST. 10 TONS EST. 21 SYGF
END WALL GUTTER 1084+50.00 LT -EBL-
BEGIN WALL GUTTER 1086+00.00 LT -EBL-
CLASS 'B' RIPRAP EST. 11 TONS EST. 24 SYGF
SINGLE FACED CONCRETE BARRIER
WALL GUTTER BEHIND WALL SEE DETAIL U
TEMP. IMPACTS IN SURFACE WATER
CLASS 'B' RIPRAP EST. 14 TONS EST. 30 SYGF
END WALL GUTTER BEGIN SBG 1093+00.00 LT -EBL-
TOE PROTECTION SEE DETAIL LLL EST. 185 TONS EST. 260 SYGF
END SBG STA. 1094+75.00 LT -EBL-
15" RCP-IV
-EBL-
-WBL-
SITE 24
SDX
END SHLD TRANSITION BEGIN SBG STA. 1084+38.51 RT -EBL-
END SBG STA. 1089+00.00 RT -EBL-
GREU TL-3
REMOVE
24" RCP-IV
PLUG & FILL W/ FLOWABLE MATERIAL
30" RCP-IV
BEGIN SBG STA. 1088+50.00 LT -WBL-
TYPE B-77
SPEC. LAT. 'V' DITCH SEE DETAIL GGG
PROP. SHOULDER BERM GUTTER
IMPACTS IN SURFACE WATER (CHANNEL CHANGE)
BEGIN SBG 1094+00.00 RT -EBL-
STANDARD 'V' DITCH SEE DETAIL HHH 35 SYGF
CHANNEL MODIFICATION SEE DETAIL Z CLASS 'I' RIPRAP EST. 32 TONS EST. 63 SYGF
48" RCP-IV
BLIND JB
PIPE NOT BURIED
48" WELDED STEEL PIPE 0.625" WALL THICKNESS TRENCHLESS INSTALLATION
LATERAL 'V' DITCH SEE DETAIL EEEE
LATERAL 'V' DITCH SEE DETAIL JJJ 245 SYGF EST. 1218 CY DDE
30" CSP W/2 ELBOWS
CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL
CLASS 'B' RIPRAP EST. 2 TONS EST. 4 SYGF
TOE PROTECTION SEE DETAIL LLL EST. 120 TONS EST. 165 SYGF
END SBG BEGIN WALL GUTTER 1093+89.00 RT -WBL-
WALL GUTTER BEHIND WALL SEE DETAIL U
IMPACTS IN SURFACE WATER (STREAM RELOCATION)
TEMP. IMPACTS IN SURFACE WATER
SITE 23
SDX
-WBL- 1085
-WBL- 1090
-WBL- 1095
TEMP. IMPACTS IN SURFACE WATER
IMPACTS IN SURFACE WATER (CHANNEL CHANGE)
IMPACTS IN SURFACE WATER (48" WSP/RCP)
TEMP. IMPACTS IN SURFACE WATER
50' 0' 50' 100' 150'
GRAPHIC SCALE

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
11/30/2018 ...I4700B_HYD_PRM_PSH_23.dgn

7/19/2017

HNTB NORTH CAROLINA, P.C.
343 Fayetteville Street, Suite 200
Raleigh, North Carolina 27601
NC License No. C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	23
R/W SHEET NO.	I-4700B-33
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 51 OF 97

WETLAND & STREAM IMPACTS

NAD 83

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

MATCHLINE SHEET 22
–WBL– STA 1082+00.00
–EBL– STA 1082+01.78

MATCHLINE SHEET 24
–WBL– STA 1095+00.00
–EBL– STA 1095+43.86

–EBL– 1085
–EBL– 1090
–EBL– 1095
–EBL– TS STA. 1094+19.70
–WBL– 1085
–WBL– 1090
–WBL– 1095
BILTMORE FARMS, LLC
BILTMORE FARMS, INC.

SITE 23 SDX
SITE 24 SDX

2' SPEC. LAT. BASE DITCH SEE DETAIL FFF EST. 32 CY DDE
CLASS 'B' RIPRAP EST. 10 TONS EST. 21 SYGF
END WALL GUTTER 1084+50.00 LT –EBL–
BEGIN WALL GUTTER 1086+00.00 LT –EBL–
CLASS 'B' RIPRAP EST. 11 TONS EST. 24 SYGF
SINGLE FACED CONCRETE BARRIER
WALL GUTTER BEHIND WALL SEE DETAIL U
END SHLD TRANSITION BEGIN SBG STA. 1084+38.51 RT –EBL–
REMOVE 15" RCP–IV
24" RCP–IV
15" RCP–IV
PLUG & FILL W/ FLOWABLE MATERIAL
30" RCP–IV
END SBG STA. 1089+00.00 RT –EBL–
GREU TL–3
BEGIN SBG STA. 1088+50.00 LT –WBL–
TYPE B–77
SPEC. LAT. 'V' DITCH SEE DETAIL GGG
LATERAL 'V' DITCH SEE DETAIL EEEE
LATERAL 'V' DITCH SEE DETAIL JJJ 245 SYGF EST. 1218 CY DDE
IMPACTS IN SURFACE WATER (STREAM RELOCATION)
TEMP. IMPACTS IN SURFACE WATER
TEMP. IMPACTS IN SURFACE WATER
CLASS 'B' RIPRAP EST. 14 TONS EST. 30 SYGF
END WALL GUTTER BEGIN SBG 1093+00.00 LT –EBL–
TOE PROTECTION SEE DETAIL LLL EST. 185 TONS EST. 260 SYGF
END SBG STA. 1094+75.00 LT –EBL–
BEGIN SBG 1094+00.00 RT –EBL–
STANDARD 'V' DITCH SEE DETAIL HHH 35 SYGF
CHANNEL MODIFICATION SEE DETAIL Z CLASS 'I' RIPRAP EST. 32 TONS EST. 63 SYGF
48" RCP–IV
BLIND JB
PIPE NOT BURIED
PROP. SHOULDER BERM GUTTER
IMPACTS IN SURFACE WATER (CHANNEL CHANGE)
48" WELDED STEEL PIPE 0.625" WALL THICKNESS TRENCHLESS INSTALLATION
BLIND JB
48" RCP–IV
30" CSP W/2 ELBOWS
CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL
CLASS 'B' RIPRAP EST. 2 TONS EST. 4 SYGF
TEMP. IMPACTS IN SURFACE WATER
IMPACTS IN SURFACE WATER (CHANNEL CHANGE)
IMPACTS IN SURFACE WATER (48" WSP/RCP)
TEMP. IMPACTS IN SURFACE WATER
TOE PROTECTION SEE DETAIL LLL EST. 120 TONS EST. 165 SYGF
END SBG BEGIN WALL GUTTER 1093+89.00 RT –WBL–
WALL GUTTER BEHIND WALL SEE DETAIL U

50' 0' 50' 100' 150'
GRAPHIC SCALE

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

11/30/2018
I-4700B_HYD_PRM_PSH_23.dgn
HNTB

7/19/2017

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

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

PERMIT DRAWING
SHEET 52 OF 97

WETLAND & STREAM IMPACTS

NAD 83

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 25
–EBL– STA 1109+13.21

MATCHLINE SHEET 23
–WBL– STA 1095+00.00

MATCHLINE SHEET 25
–WBL– STA 1108+00.00

BILTMORE FARMS, INC.
DB 1222 PG 645

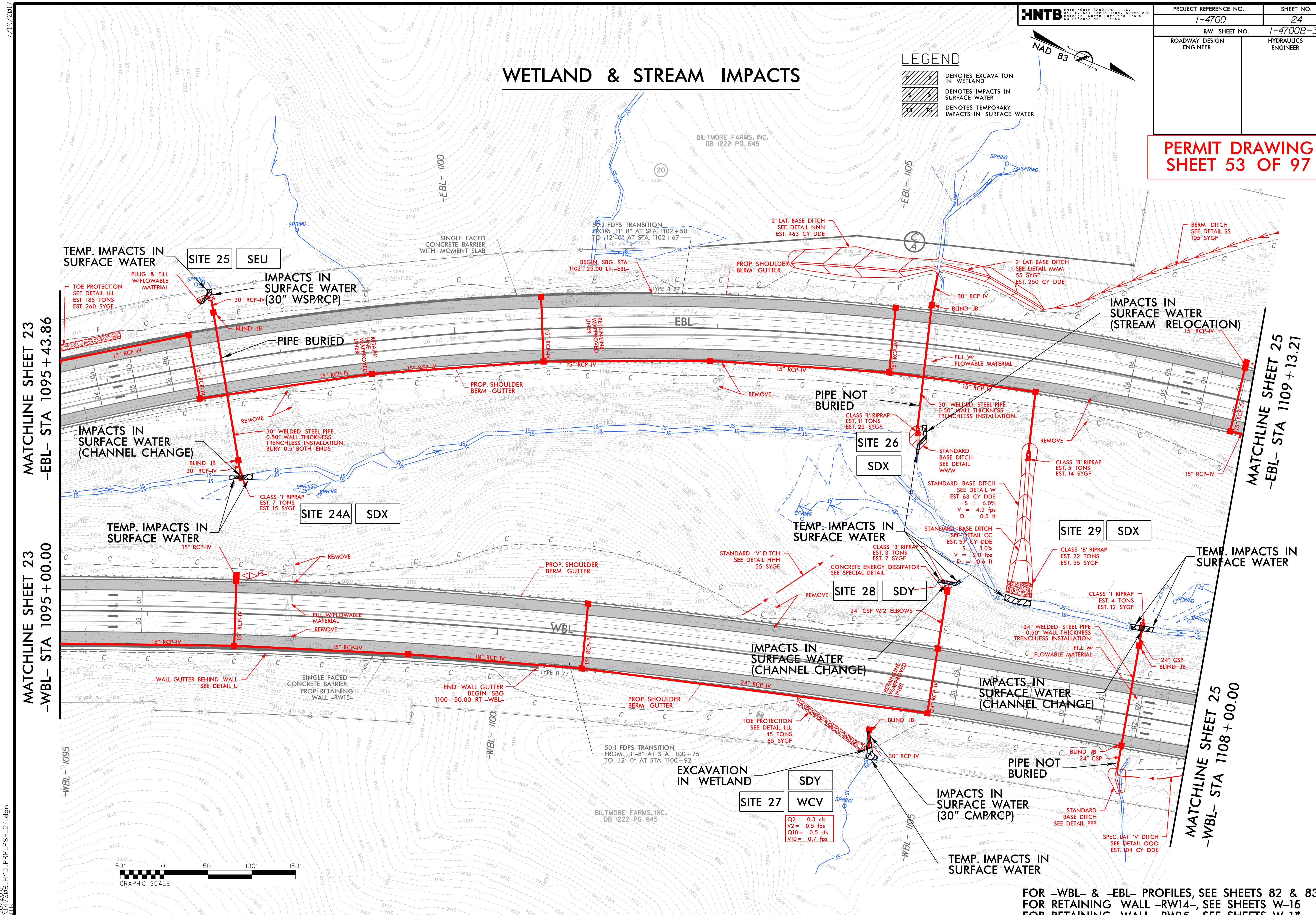
TEMP. IMPACTS IN SURFACE WATER
SITE 25 SEU
PLUG & FILL W/FLOWABLE MATERIAL
TOE PROTECTION SEE DETAIL LLL EST. 185 TONS EST. 260 SYGF
IMPACTS IN SURFACE WATER (30" WSP/RCP)
30" RCP-IV
BLIND JB
PIPE BURIED
15" RCP-IV
REMOVE
30" WELDED STEEL PIPE 0.50" WALL THICKNESS TRENCHLESS INSTALLATION BURY 0.5' BOTH ENDS
IMPACTS IN SURFACE WATER (CHANNEL CHANGE)
CLASS 'I' RIPRAP EST. 7 TONS EST. 15 SYGF
SITE 24A SDX
TEMP. IMPACTS IN SURFACE WATER

SINGLE FACED CONCRETE BARRIER WITH MOMENT SLAB
50:1 FDPS TRANSITION FROM 11'-8" AT STA. 1102+50 TO 11'-0" AT STA. 1102+67
BEGIN SBG STA. 1102+25.00 LT –EBL–
TYPE B-77
PROP. SHOULDER BERM GUTTER
RETAINING LINE WALL APPROVED LINER
PROP. SHOULDER BERM GUTTER
2' LAT. BASE DITCH SEE DETAIL NNN EST. 463 CY DDE
2' LAT. BASE DITCH SEE DETAIL MMM 55 SYGF EST. 250 CY DDE
BERM DITCH SEE DETAIL SS 105 SYGF
IMPACTS IN SURFACE WATER (STREAM RELOCATION)
FILL W/ FLOWABLE MATERIAL
PIPE NOT BURIED
CLASS 'I' RIPRAP EST. 11 TONS EST. 22 SYGF
SITE 26 SDX
STANDARD BASE DITCH SEE DETAIL WWW
STANDARD BASE DITCH SEE DETAIL W EST. 63 CY DDE S = 6.0% V = 4.3 fps D = 0.5 ft
CLASS 'B' RIPRAP EST. 5 TONS EST. 14 SYGF
CLASS 'B' RIPRAP EST. 22 TONS EST. 55 SYGF
SITE 29 SDX
TEMP. IMPACTS IN SURFACE WATER
STANDARD 'V' DITCH SEE DETAIL HHH 55 SYGF
CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL
CLASS 'B' RIPRAP EST. 3 TONS EST. 7 SYGF
STANDARD BASE DITCH SEE DETAIL CC EST. 57 CY DDE S = 1.0% V = 2.0 fps D = 0.6 ft
SITE 28 SDY
24" CSP W/2 ELBOWS
CLASS 'I' RIPRAP EST. 4 TONS EST. 12 SYGF
24" WELDED STEEL PIPE 0.50" WALL THICKNESS TRENCHLESS INSTALLATION
FILL W/ FLOWABLE MATERIAL
24" CSP BLIND JB
IMPACTS IN SURFACE WATER (CHANNEL CHANGE)
WALL GUTTER BEHIND WALL SEE DETAIL U
SINGLE FACED CONCRETE BARRIER PROP. RETAINING WALL –RW15–
END WALL GUTTER BEGIN SBG 1100+50.00 RT –WBL–
50:1 FDPS TRANSITION FROM 11'-8" AT STA. 1100+75 TO 12'-0" AT STA. 1100+92
EXCAVATION IN WETLAND
SITE 27 WCV
SDY
Q2= 0.3 cfs
V2= 0.5 fps
Q10= 0.5 cfs
V10= 0.7 fps
IMPACTS IN SURFACE WATER (30" CMP/RCP)
PIPE NOT BURIED
BLIND JB 24" CSP
STANDARD BASE DITCH SEE DETAIL PPP
SPEC. LAT. 'V' DITCH SEE DETAIL OOO EST. 104 CY DDE
TEMP. IMPACTS IN SURFACE WATER

50' 0' 50' 100' 150'
GRAPHIC SCALE

FOR –WBL– & –EBL– PROFILES, SEE SHEETS 82 & 83
FOR RETAINING WALL –RW14–, SEE SHEETS W-16
FOR RETAINING WALL –RW15–, SEE SHEETS W-18

11/30/2016
I-4700B_HYD_PRM_PSH_24.dgn
HNTB



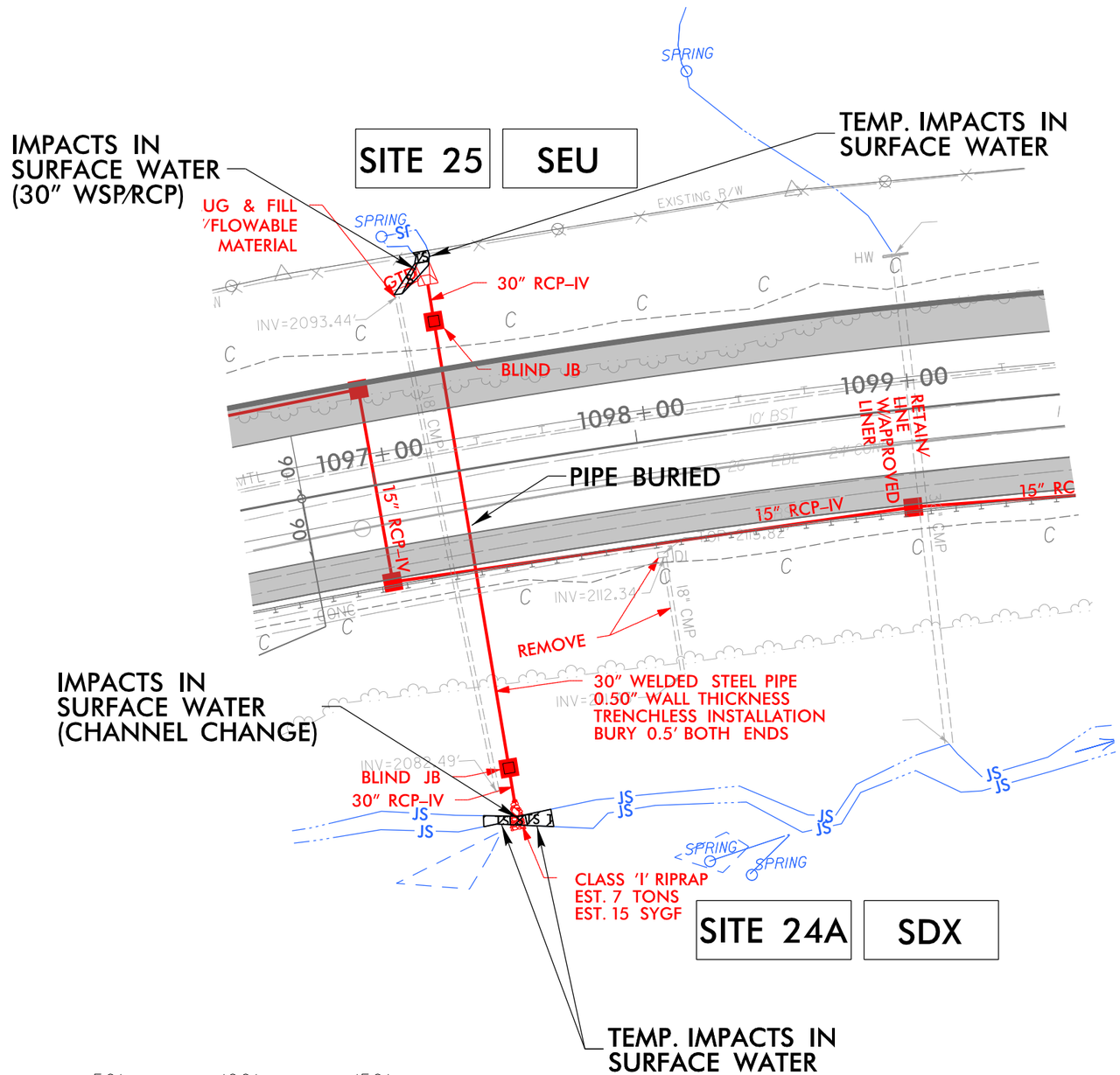
WETLAND & STREAM IMPACTS
LEGEND
DENOTES EXCAVATION IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
PROJECT REFERENCE NO. I-4700
SHEET NO. 24
R/W SHEET NO. I-4700B-34
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PERMIT DRAWING SHEET 53 OF 97
NAD 83
BILTMORE FARMS, INC. DB 1222 PG 645
TEMP. IMPACTS IN SURFACE WATER
SITE 25
SEU
IMPACTS IN SURFACE WATER (30" WSP/RCP)
PIPE BURIED
IMPACTS IN SURFACE WATER (CHANNEL CHANGE)
TEMP. IMPACTS IN SURFACE WATER
SITE 24A
SDX
PIPE NOT BURIED
SITE 26
SDX
IMPACTS IN SURFACE WATER (STREAM RELOCATION)
TEMP. IMPACTS IN SURFACE WATER
SITE 29
SDX
SITE 28
SDY
TEMP. IMPACTS IN SURFACE WATER
IMPACTS IN SURFACE WATER (CHANNEL CHANGE)
IMPACTS IN SURFACE WATER (CHANNEL CHANGE)
EXCAVATION IN WETLAND
SITE 27
SDY
WCV
IMPACTS IN SURFACE WATER (30" CMP/RCP)
PIPE NOT BURIED
TEMP. IMPACTS IN SURFACE WATER
Q2 = 0.3 cfs
V2 = 0.5 fps
Q10 = 0.5 cfs
V10 = 0.7 fps
-EBL-
WBL
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
GRAPHIC SCALE
50' 0' 50' 100' 150'
FOR -WBL- & -EBL- PROFILES, SEE SHEETS 82 & 83
FOR RETAINING WALL -RW14-, SEE SHEETS W-16
FOR RETAINING WALL -RW15-, SEE SHEETS W-17

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

PROJECT REFERENCE NO.	SHEET NO.
I-4700	24
R/W SHEET NO.	I-4700B-34
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83

PERMIT DRAWING
SHEET 54 OF 97



LEGEND

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

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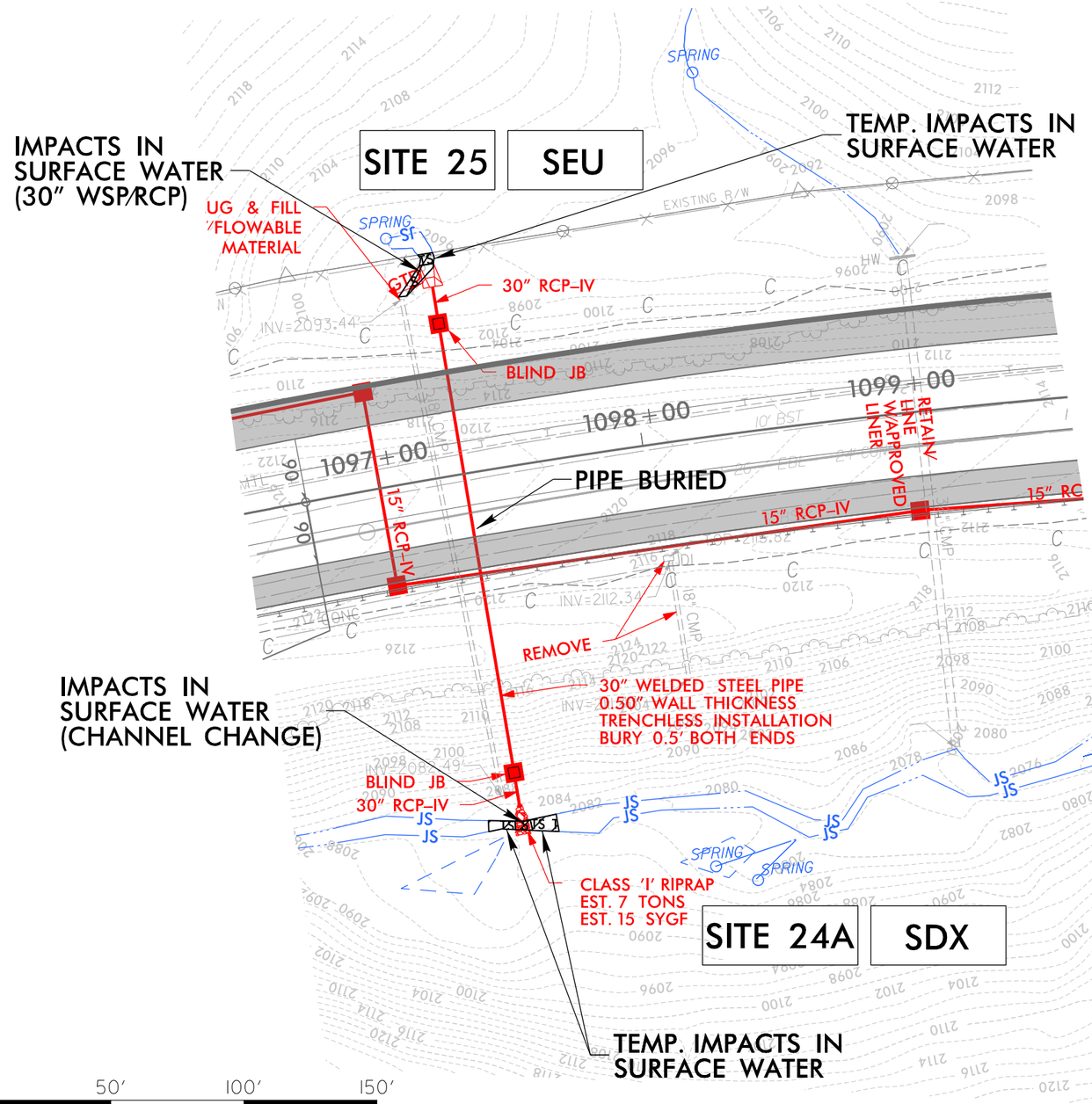
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	24
R/W SHEET NO.	I-4700B-34
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83

PERMIT DRAWING
SHEET 55 OF 97



LEGEND

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

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

PROJECT REFERENCE NO.	SHEET NO.
I-4700	24
R/W SHEET NO.	I-4700B-34
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83

PERMIT DRAWING SHEET 56 OF 97

PIPE NOT BURIED

CLASS 'I' RIPRAP
EST. 11 TONS
EST. 22 SYGF

30" WELDED STEEL PIPE
0.50" WALL THICKNESS
TRENCHLESS INSTALLATION

SITE 26
SDX

STANDARD
BASE DITCH
SEE DETAIL
WWW

IMPACTS IN
SURFACE WATER
(STREAM RELOCATION)

REMOVE

CLASS 'B' RIPRAP
EST. 5 TONS
EST. 14 SYGF

INV=2071.48'

15" RCP-

STANDARD BASE DITCH
SEE DETAIL W
EST. 63 CY DDE
S = 6.0%
V = 4.3 fps
D = 0.5 ft

TEMP. IMPACTS IN
SURFACE WATER

STANDARD BASE DITCH
SEE DETAIL CC
EST. 57 CY DDE
S = 1.0%
V = 2.0 fps
D = 0.6 ft

SITE 29
SDX

CLASS 'B' RIPRAP
EST. 22 TONS
EST. 55 SYGF

CLASS 'B' RIPRAP
EST. 3 TONS
EST. 7 SYGF

CONCRETE ENERGY DISSIPATOR
SEE SPECIAL DETAIL

REMOVE

SITE 28
SDY

24" CSP W/2 ELBOWS

IMPACTS IN
SURFACE WATER
(CHANNEL CHANGE)

CLASS 'I' RIPRAP
EST. 4 TONS
EST. 12 SYGF

IMPACTS IN
SURFACE WATER
(CHANNEL CHANGE)

24" WELDED STEEL PIPE
0.50" WALL THICKNESS
TRENCHLESS INSTALLATION

INV=2049.25'

FILL W/
FLOWABLE MATERIAL

24" CSP
BLIND JB

TEMP. IMPACTS IN
SURFACE WATER

INV=2090.49'

TOP=2093.73'

1104+00

1105+00

1106+00

1107+00

1108+00

RETAINING LINE
W/APPROVED
LINER

24" RCP-IV

IV

BM #26

PROTECTION
EE DETAIL LLL
45 TONS
65 SYGF

BLIND JB

EXCAVATION
IN WETLAND

IMPACTS IN
SURFACE WATER
(30" CMP/RCP)

30" RCP-IV

42' TYP.

48" WW W/ 2SBW

BLIND JB
24" CSP

PIPE NOT
BURIED

SDY
SITE 27
WCV

TEMP. IMPACTS IN
SURFACE WATER

SPRING

STANDARD
BASE DITCH
SEE DETAIL PPP

LEGEND

S S	DENOTES IMPACTS IN SURFACE WATER
TS TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER
E E	DENOTES EXCAVATION IN WETLAND

50' 0' 50' 100' 150'
GRAPHIC SCALE

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

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

NAD 83

PERMIT DRAWING SHEET 57 OF 97

PIPE NOT BURIED

30" WELDED STEEL PIPE
0.50" WALL THICKNESS
TRENCHLESS INSTALLATION

CLASS 'I' RIPRAP
EST. 11 TONS
EST. 22 SYGF

SITE 26 | SDX

STANDARD BASE DITCH
SEE DETAIL WWW

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

REMOVE

CLASS 'B' RIPRAP
EST. 5 TONS
EST. 14 SYGF

15" RCP

STANDARD BASE DITCH
SEE DETAIL W
EST. 63 CY DDE
S = 6.0%
V = 4.3 fps
D = 0.5 ft

TEMP. IMPACTS IN SURFACE WATER

STANDARD BASE DITCH
SEE DETAIL CC
EST. 57 CY DDE
S = 1.0%
V = 2.0 fps
D = 0.6 ft

CLASS 'B' RIPRAP
EST. 3 TONS
EST. 7 SYGF

SITE 29 | SDX

CLASS 'B' RIPRAP
EST. 22 TONS
EST. 55 SYGF

CONCRETE ENERGY DISSIPATOR
SEE SPECIAL DETAIL

REMOVE

SITE 28 | SDY

24" CSP W/2 ELBOWS

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

CLASS 'I' RIPRAP
EST. 4 TONS
EST. 12 SYGF

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

24" WELDED STEEL PIPE
0.50" WALL THICKNESS
TRENCHLESS INSTALLATION

FILL W/ FLOWABLE MATERIAL

24" CSP
BLIND JB

TEMP. IMPACTS IN SURFACE WATER

1104 + 00 | 1105 + 00 | 1106 + 00 | 1107 + 00 | 1108 + 00

RETAINING LINE W/APPROVED LINER

24" RCP-IV

PROTECTION
EE DETAIL LLL
45 TONS
65 SYGF

BLIND JB

EXCAVATION IN WETLAND

IMPACTS IN SURFACE WATER (30" CMP/RCP)

30" RCP-IV

42' TYP.

12' FDPS

48' WW W/ 2SBW

BLIND JB
24" CSP

PIPE NOT BURIED

TEMP. IMPACTS IN SURFACE WATER

STANDARD BASE DITCH
SEE DETAIL PPP

SITE 27 | SDY | WCV

SPRING

LEGEND

- S S — DENOTES IMPACTS IN SURFACE WATER
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- E E — DENOTES EXCAVATION IN WETLAND

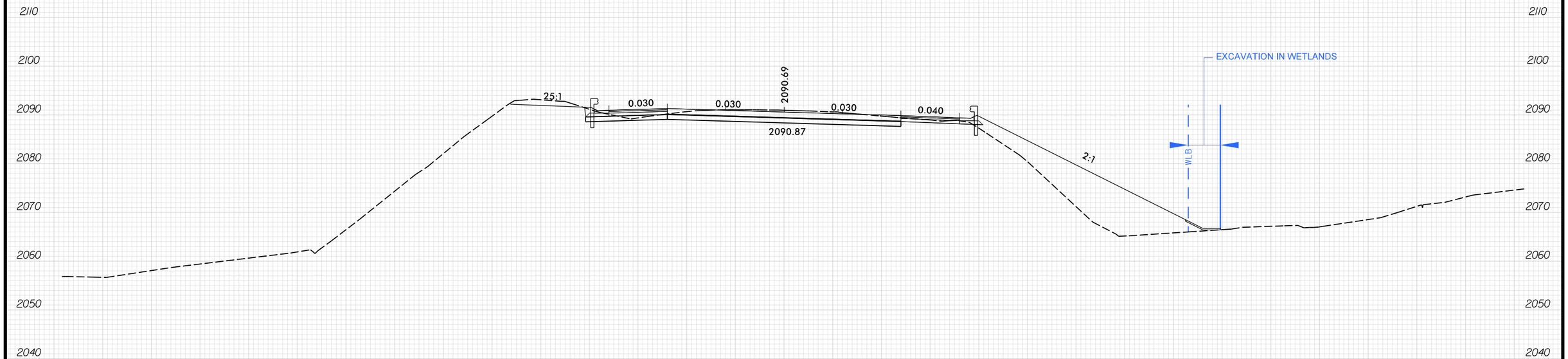
50' 0' 50' 100' 150'
GRAPHIC SCALE

6/23/16

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

PERMIT DRAWING
SHEET 58 OF 97

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.)

11/14/2018
I-4700B_HYD_PRM_XPL.dgn
HNTB

7/19/2017

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

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

PERMIT DRAWING SHEET 59 OF 97

WETLAND & STREAM IMPACTS

NAD 83

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

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

BILTMORE FARMS, LLC (20)

BILTMORE FARMS, INC.

–EBL– 1110

–EBL– 1115

–EBL– 1120

–WBL– 1110

–WBL– 1115

–WBL– 1120

BERM DITCH SEE DETAIL SS 240 SYGF

BERM DITCH SEE DETAIL D

BERM DITCH SEE DETAIL D

BERM DITCH SEE DETAIL SS 80 SYGF

BERM DITCH SEE DETAIL D

BERM DITCH SEE DETAIL SS 175 SYGF

BDO

18" CSP W/1 ELBOW

24" RCP–IV

30" CS W/1 ELBOW

30" RCP–IV

15" RCP–IV

15" RCP–IN

30" RCP–IV

24" CSP W/1 ELBOW

24" RCP–IV

FS–3

REMOVE

PROP. SHOULDER BERM GUTTER

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

IMPACTS IN SURFACE WATER (66" WSP/RCP)

PIPE NOT BURIED

SITE 30 SDX

SITE 31 SDX

CLASS 'B' RIPRAP EST. 8 TONS EST. 21 SYGF

CLASS 'B' RIPRAP EST. 3 TONS EST. 12 SYGF

CLASS 'B' RIPRAP EST. 6 TONS EST. 13 SYGF

CLASS 'B' RIPRAP EST. 6 TONS EST. 13 SYGF

CLASS 'B' RIPRAP EST. 5 TONS EST. 14 SYGF

CLASS 'I' RIPRAP EST. 48 TONS EST. 89 SYGF

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

24" CSP W/ 2 ELBOWS

FILL W/ FLOWABLE MATERIAL

66" WELDED STEEL PIPE 0.875" WALL THICKNESS TRENCHLESS INSTALLATION PIPE NOT BURIED

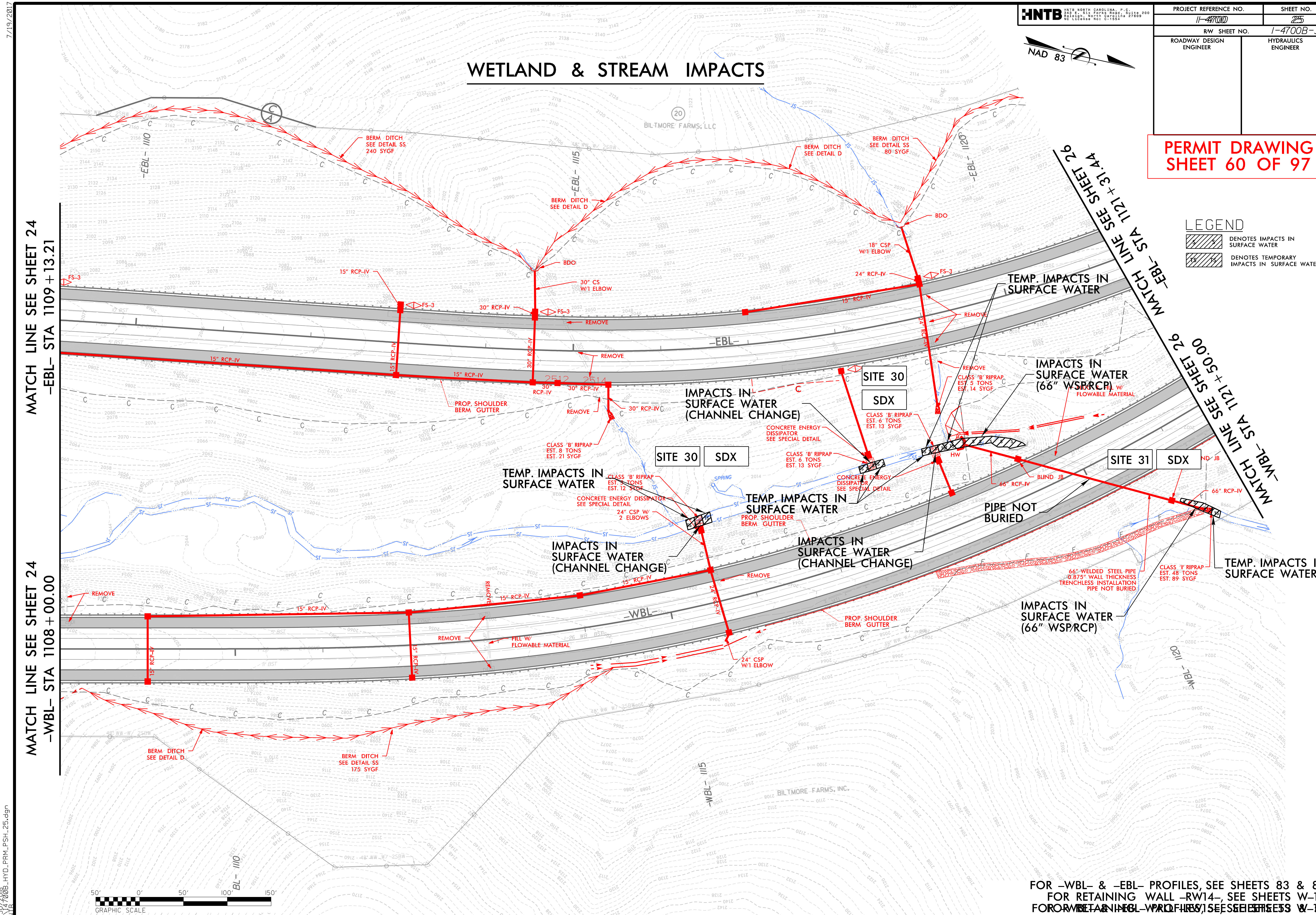
66" RCP–IV

BLIND JB

48" WW W/ 25BW

GRAPHIC SCALE 50' 0' 50' 100' 150'

FOR –WBL– & –EBL– PROFILES, SEE SHEETS 83 & 84
FOR RETAINING WALL –RW14–, SEE SHEETS W–16
FOR –WBL– & –EBL– PROFILES, SEE SHEETS 83 & 84
FOR RETAINING WALL –RW14–, SEE SHEETS W–16 & W–17



HNTB
PROJECT REFERENCE NO.
I-4700
SHEET NO.
25
RW SHEET NO.
I-4700B-35
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PERMIT DRAWING
SHEET 60 OF 97
NAD 83
WETLAND & STREAM IMPACTS
LEGEND
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
BILTMORE FARMS, LLC
BILTMORE FARMS, INC.
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
-EBL-
-WBL-
BERM DITCH SEE DETAIL SS 240 SYGF
BERM DITCH SEE DETAIL D
BERM DITCH SEE DETAIL SS 80 SYGF
BERM DITCH SEE DETAIL SS 175 SYGF
BDO
30" CS W/1 ELBOW
18" CSP W/1 ELBOW
24" CSP W/1 ELBOW
24" CSP W/ 2 ELBOWS
15" RCP-IV
24" RCP-IV
30" RCP-IV
66" RCP-IV
REMOVE
PROP. SHOULDER BERM GUTTER
CLASS 'B' RIPRAP EST. 8 TONS EST. 21 SYGF
CLASS 'B' RIPRAP EST. 5 TONS EST. 12 SYGF
CLASS 'B' RIPRAP EST. 6 TONS EST. 13 SYGF
CLASS 'B' RIPRAP EST. 5 TONS EST. 14 SYGF
CLASS 'I' RIPRAP EST. 48 TONS EST. 89 SYGF
CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL
FILL W/ FLOWABLE MATERIAL
SITE 30
SDX
SITE 31
TEMP. IMPACTS IN SURFACE WATER
IMPACTS IN SURFACE WATER (CHANNEL CHANGE)
IMPACTS IN SURFACE WATER (66" WSP/RCP)
PIPE NOT BURIED
BLIND JB
66" WELDED STEEL PIPE 0.875" WALL THICKNESS TRENCHLESS INSTALLATION PIPE NOT BURIED
SPRING
GRAPHIC SCALE
FOR -WBL- & -EBL- PROFILES, SEE SHEETS 83 & 84
FOR RETAINING WALL -RW14-, SEE SHEETS W-16
FOR -WBL- & -EBL- PROFILES, SEE SHEETS 53 & 54
7/19/2017
11/30/2018
I4700B_HYD_PRM_PSH_25.dgn

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

PROJECT REFERENCE NO.	SHEET NO.
I-4700	25
R/W SHEET NO.	I-4700B-35
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83

PERMIT DRAWING
SHEET 61 OF 97

LEGEND

- S S — DENOTES IMPACTS IN SURFACE WATER
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

TEMP. IMPACTS IN SURFACE WATER

SITE 30

SDX

REMOVE

CLASS 'B' RIPRAP
EST. 5 TONS
EST. 14 SYGF

IMPACTS IN SURFACE WATER (66" WSP/RCP)

PLUG & FILL W/ FLOWABLE MATERIAL

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

CLASS 'B' RIPRAP
EST. 6 TONS
EST. 13 SYGF

SITE 30 | SDX

CLASS 'B' RIPRAP
EST. 6 TONS
EST. 13 SYGF

HW

SITE 31 | SDX

ND JB

CLASS 'B' RIPRAP
EST. 5 TONS
EST. 12 SYGF

ENERGY DISSIPATOR DETAIL

24" CSP W/ 2 ELBOWS

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

66" RCP–IV

BLIND JB

PIPE NOT BURIED

66" RCP–IV

PROP. SHOULDER BERM GUTTER

1119+00

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

1118+00

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (66" WSP/RCP)

1117+00

RCP–IV

REMOVE

1116+00

TEMP. IMPACTS IN SURFACE WATER

24" RCP–IV

1115+00

BL

66" WELDED STEEL PIPE
0.875" WALL THICKNESS
TRENCHLESS INSTALLATION
PIPE NOT BURIED

CLASS 'I' RIPRAP
EST. 48 TONS
EST. 89 SYGF

TEMP. IMPACTS IN SURFACE WATER

PROP. SHOULDER BERM GUTTER

1121+00

1120+00

50' 0' 50' 100' 150'

GRAPHIC SCALE

HNTB NORTH CAROLINA, P.C.
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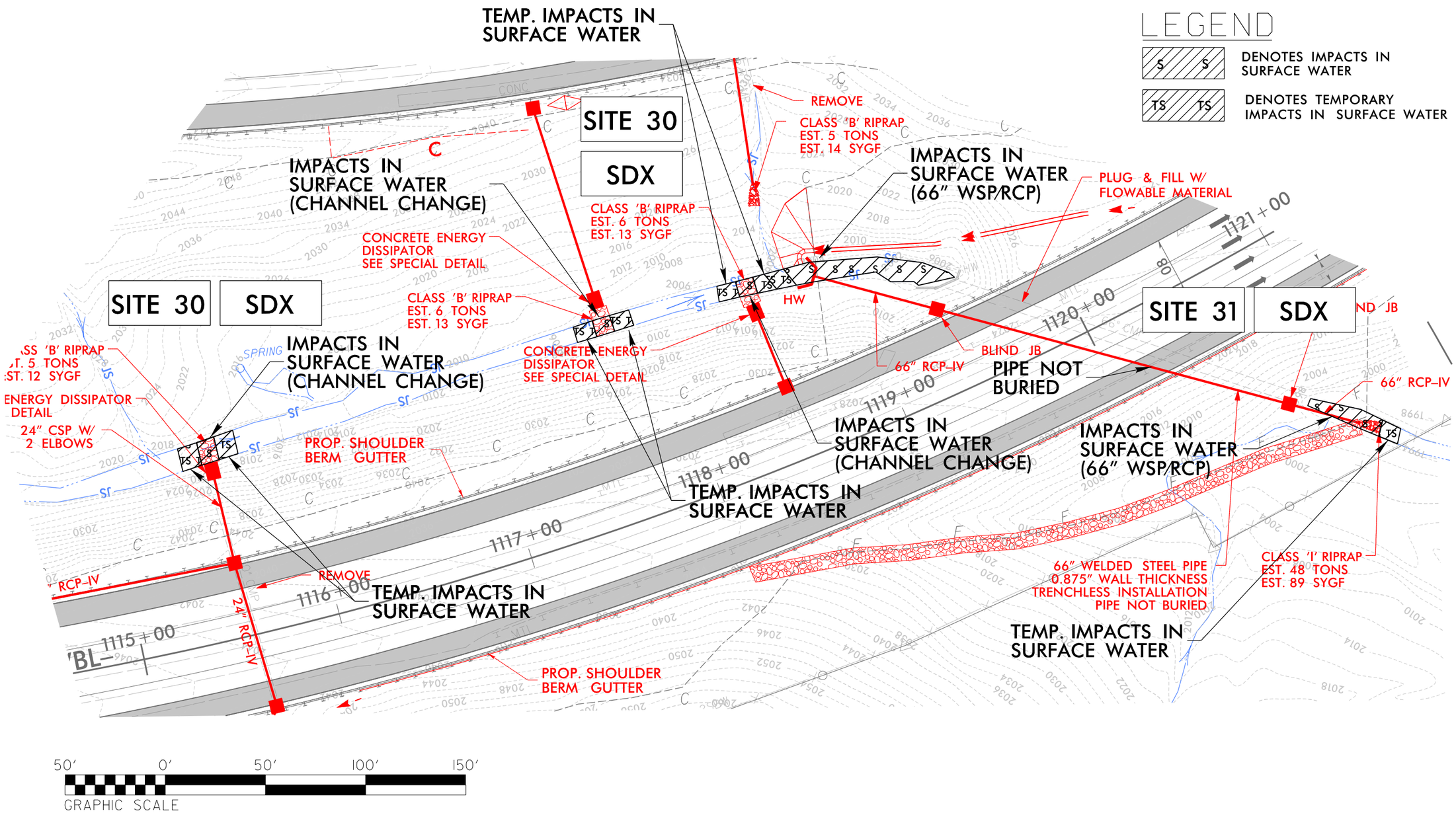
Raleigh, North Carolina 27609
NC License No: C-1554

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

NAD 83

PERMIT DRAWING
SHEET 62 OF 97



6/23/16

PROJ. REFERENCE NO.	SHEET NO.
I-4700	

PERMIT DRAWING
SHEET 63 OF 97

250 200 150 100 50 ℄ 50 100 150 200 250

2040
2030
2020
2010
2000
1990

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

WS EL. = 2003.1'
SURVEY 09–10–17

NATURAL GROUND
RIGHT BANK

HW

66" RCP–IV

BLIND
JB

66" WELDED STEEL PIPE
0.875" WALL THICKNESS
TRENCHLESS INSTALLATION
PIPE NOT BURIED

BLIND
JB

66" RCP–IV

NATURAL GROUND
LEFT BANK

NATURAL GROUND
INV. = 2002.8

INV. = 2000.8

INV. = 1995.0

INV. = 1993.8

NATURAL GROUND

NATURAL GROUND
LEFT BANK

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.)

11/30/2018
I-4700B_HYD_PRM_PSH_25B_PFL.dgn
HNTB

7/19/2017

HNTB NORTH CAROLINA, P.C.
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PROJECT REFERENCE NO.	SHEET NO.
I-4700	26
RW SHEET NO.	I-4700B-36
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 64 OF 97

WETLAND & STREAM IMPACTS

NAD 83

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

MATCHLINE SHEET 25
–EBL– STA 1121+31.44

MATCHLINE SHEET 25
–WBL– STA 1121+50.00

MATCHLINE SHEET 27
–L– STA 1135+00.00

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

IMPACTS IN SURFACE WATER (60" WSP/RCP)

SITE 33 SEQ

SITE 32 WCW

SITE 32 SEQ

WCW SEQ

BILTMORE FARMS, LLC

BILTMORE FARMS, INC.

DRAINAGE DITCH

–EBL– 1130

–EBL– 1125

–WBL– 1130

–WBL– 1125

50:1 FDPS TRANSITION FROM 12'–0" AT STA. 1123+58 TO 11'–8" AT STA. 1123+75

BERM DITCH SEE DETAIL SS 230 SYGF

BDO 18" CSP W/1 ELBOW

2GI–A FG

4GI–A SG

2GI–SPECIAL DESIGN SG

18" RCP–IV

24" RCP–IV

36" RCP–IV

60" RCP–IV

15" RCP–IV

SPEC. LAT. 'V' DITCH SEE DETAIL OOO

SPEC. LAT. 'V' DITCH SEE DETAIL UUU EST. 15 TONS EST. 30 SYGF

SPECIAL LATERAL 'V' DITCH SEE DETAIL OOO

END SBG STA. 1123+99.90 RT –EBL–

END SBG STA. 1128+50.00 LT –WBL–

PROP. SHOULDER BERM GUTTER

2' LATERAL BASE DITCH SEE DETAIL NNN EST. 673 CY DDE

BLIND JB

FILL W/ FLOWABLE MATERIAL

PIPE BURIED

FILL IN WETLAND

REMOVE

TOE PROTECTION SEE DETAIL TTT EST. 254 TONS EST. 549 SYGF

60" WELDED STEEL PIPE 0.875" WALL THICKNESS TRENCHLESS INSTALLATION BURY 1' BOTH ENDS

JB W/MH

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

CLASS 'I' RIPRAP EST. 33 TONS EST. 62 SYGF

CLASS 'B' RIPRAP EST. 2 TONS EST. 3 SYGF

24" CSP W/ 2 ELBOWS

CLASS 'B' RIPRAP EST. 2 TONS EST. 5 SYGF

Q2= 4.4 cfs
V2= 2.2 fps
Q10= 4.8 cfs
V10= 2.2 fps

Q2= 45 cfs
V2= 1.3 fps
Q10= 70 cfs
V10= 1.5 fps

MECHANIZED CLEARING IN WETLAND

IMPACTS IN SURFACE WATER (60" WSP/RCP)

TEMP. IMPACTS IN SURFACE WATER

FILL IN WETLAND

MECHANIZED CLEARING IN WETLAND

GRAPHIC SCALE 50' 0' 50' 100' 150'

FOR –WBL– & –EBL– PROFILES, SEE SHEET 84
FOR –L– WB & EB PROFILES, SEE SHEET 85

11/30/2018
I-4700B_HYD_PRM_PSH_26.dgn
HNTB

7/19/2017

WETLAND & STREAM IMPACTS

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
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NC License No: C-1554

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

PERMIT DRAWING SHEET 65 OF 97

NAD 83

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

MATCHLINE SHEET 25 –WBL– STA 1121+50.00

MATCHLINE SHEET 25 –EBL– STA 1121+31.44

MATCHLINE SHEET 27 –L– STA 1135+00.00

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

IMPACTS IN SURFACE WATER (60" WSP/RCP)

SITE 33 SEQ

SITE 32 WCW

SITE 32 SEQ

WCW SEQ

BILTMORE FARMS, LLC

BILTMORE FARMS, INC.

50:1 FDPS TRANSITION FROM 12'-0" AT STA. 1123+58 TO 11'-8" AT STA. 1123+75

BERM DITCH SEE DETAIL SS 230 SYGF

BDO 18" CSP W/1 ELBOW

2GI-A FG

4GI-A SG

24" RCP-IV

18" RCP-IV

SPEC. LAT. 'V' DITCH SEE DETAIL UUU EST. 15 TONS EST. 30 SYGF

PROP. SHOULDER BERM GUTTER

END SBG STA. 1123+99.90 RT –EBL–

SPECIAL LATERAL 'V' DITCH SEE DETAIL OOO

15" RCP-IV

2GI-SPECIAL DESIGN SG

36" RCP-IV

SPEC. LAT. 'V' DITCH SEE DETAIL OOO

REMOVE

2' LATERAL BASE DITCH SEE DETAIL NNN EST. 673 CY DDE

PROP. SHOULDER BERM GUTTER

BLIND JB

FILL W/ FLOWABLE MATERIAL

60" RCP-IV

TOE PROTECTION SEE DETAIL TTT EST. 254 TONS EST. 549 SYGF

PIPE BURIED

FILL IN WETLAND

FILL W/FLOWABLE MATERIAL

60" WELDED STEEL PIPE 0.875" WALL THICKNESS TRENCHLESS INSTALLATION BURY 1' BOTH ENDS

JB W/MH 60" RCP-IV

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

CLASS 'I' RIPRAP EST. 33 TONS EST. 62 SYGF

CLASS 'B' RIPRAP EST. 2 TONS EST. 3 SYGF

CLASS 'B' RIPRAP EST. 2 TONS EST. 5 SYGF

24" CSP W/ 2 ELBOWS

Q2= 4.4 cfs
V2= 2.2 fps
Q10= 4.8 cfs
V10= 2.2 fps

Q2= 45 cfs
V2= 1.3 fps
Q10= 70 cfs
V10= 1.5 fps

MECHANIZED CLEARING IN WETLAND

IMPACTS IN SURFACE WATER (60" WSP/RCP)

TEMP. IMPACTS IN SURFACE WATER

FILL IN WETLAND

MECHANIZED CLEARING IN WETLAND

–EBL– 1125

–EBL– 1130

–WBL– 1125

–WBL– 1130

–L– 1135

GRAPHIC SCALE 50' 0' 50' 100' 150'

FOR –WBL– & –EBL– PROFILES, SEE SHEET 84
FOR –L– WB & EB PROFILES, SEE SHEET 85

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Raleigh, North Carolina 27609
NC License No: C-1554

I-4700	26
R/W SHEET NO.	I-4700B-36
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83

PERMIT DRAWING SHEET 66 OF 97

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

IMPACTS IN SURFACE WATER (60" WSP/RCP))

PIPE BURIED

FILL IN WETLAND

MECHANIZED CLEARING IN WETLAND

FILL IN WETLAND

IMPACTS IN SURFACE WATER (60" WSP/RCP)

FILL IN WETLAND

SITE 33 SEQ

SITE 32 SEQ

HW

60" RCP–IV

PROP. SHOULDER BERM GUTTER

BLIND JB

1131+00

1130+00

–EBL–

RCP–IV

1131+00

–WBL–

36" RCP–IV

REMOVE

1132+00

REMOVE

1132+00

1133+00

FILL W/ FLOWABLE MATERIAL

60" WELDED STEEL PIPE
0.875" WALL THICKNESS
TRENCHLESS INSTALLATION
BURY 1' BOTH ENDS

JB W/MH

60" RCP–IV

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

CLASS 'I' RIPRAP
EST. 33 TONS
EST. 62 SYGF

CLASS 'B' RIPRAP
EST. 2 TONS
EST. 5 SYGF

EXPRESSWAY CORB

50' 0' 50' 100' 150'

GRAPHIC SCALE

LEGEND

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

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Raleigh, North Carolina 27609
NC License No: C-1554

I-4700	26
R/W SHEET NO.	I-4700B-36
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83

PERMIT DRAWING SHEET 67 OF 97

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

IMPACTS IN SURFACE WATER (60" WSP/RCP))

PIPE BURIED

FILL IN WETLAND

MECHANIZED CLEARING IN WETLAND

SITE 33 SEQ

SITE 32 SEQ

HW

60" RCP–IV

PROP. SHOULDER BERM GUTTER

BLIND JB

REMOVE

FILL W/ FLOWABLE MATERIAL

1130+00

1131+00

1132+00

1133+00

–EBL–

–WBL–

RCP–IV

36" RCP–IV

FILL W/FLOWABLE MATERIAL

60" WELDED STEEL PIPE
0.875" WALL THICKNESS
TRENCHLESS INSTALLATION
BURY 1' BOTH ENDS

JB W/MH

60" RCP–IV

CLASS 'I' RIPRAP
EST. 33 TONS
EST. 62 SYGF

CLASS 'B' RIPRAP
EST. 2 TONS
EST. 5 SYGF

CONCRETE ENERGY DISSIPATOR
SEE SPECIAL DETAIL

LEGEND

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

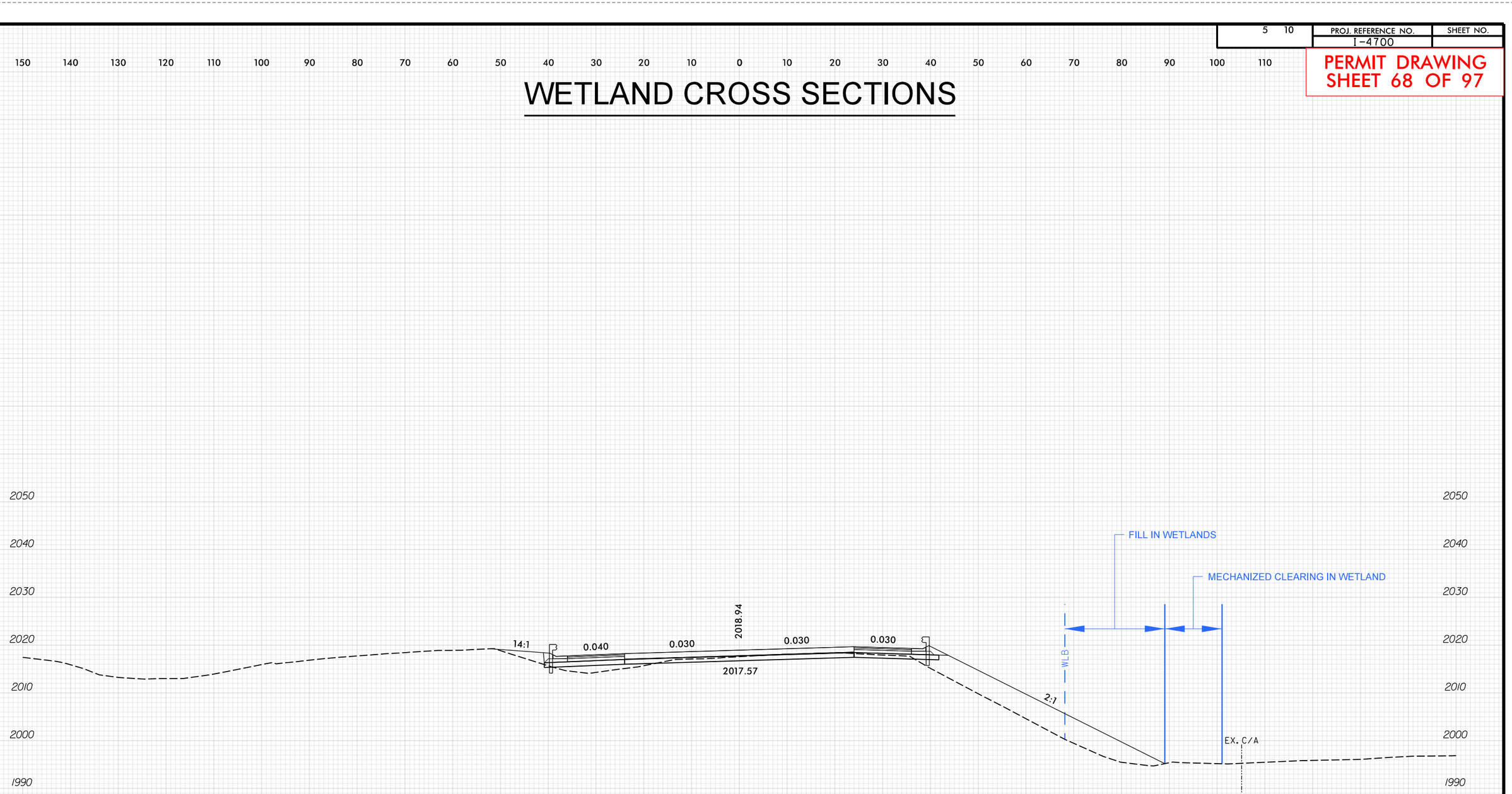
50' 0' 50' 100' 150'
GRAPHIC SCALE

6/23/16

PROJ. REFERENCE NO.	SHEET NO.
I-4700	

PERMIT DRAWING
SHEET 68 OF 97

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.)

11/30/2018
I-4700B_HYD_PRM_XPL.dgn
HNTB

6/23/16

PROJ. REFERENCE NO.	SHEET NO.
I-4700	

PERMIT DRAWING
SHEET 69 OF 97

250 200 150 100 50 ℄ 50 100 150 200 250

2040
2030
2020
2010
2000
1990

STA. 1131+00.00 –EBL–
1 @ 60″ WSP/RCP
℄ ELEV. = 2020.60
SKEW = 86°58′6″

STA. 1131+63.41 –WBL–
1 @ 60″ WSP/RCP
℄ ELEV. = 2020.86
SKEW = 87°00′3″

WS EL. = 2000.3′
SURVEY 09–10–17

NATURAL GROUND

2:1
NORMAL

NATURAL GROUND

NATURAL GROUND
LEFT BANK

60″
RCP–IV

HW

BLIND
JB

BLIND
JB

60″
RCP–IV

NATURAL GROUND
LEFT BANK

NATURAL GROUND
RIGHT BANK

INV. = 1996.2

INV. = 1995.7

INV. = 1994.1

INV. = 1993.9

NATURAL GROUND
RIGHT BANK

60″ WELDED STEEL PIPE
0.875″ WALL THICKNESS
TRENCHLESS INSTALLATION
BURY 1′ BOTH ENDS
0.96% GRADE

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.)

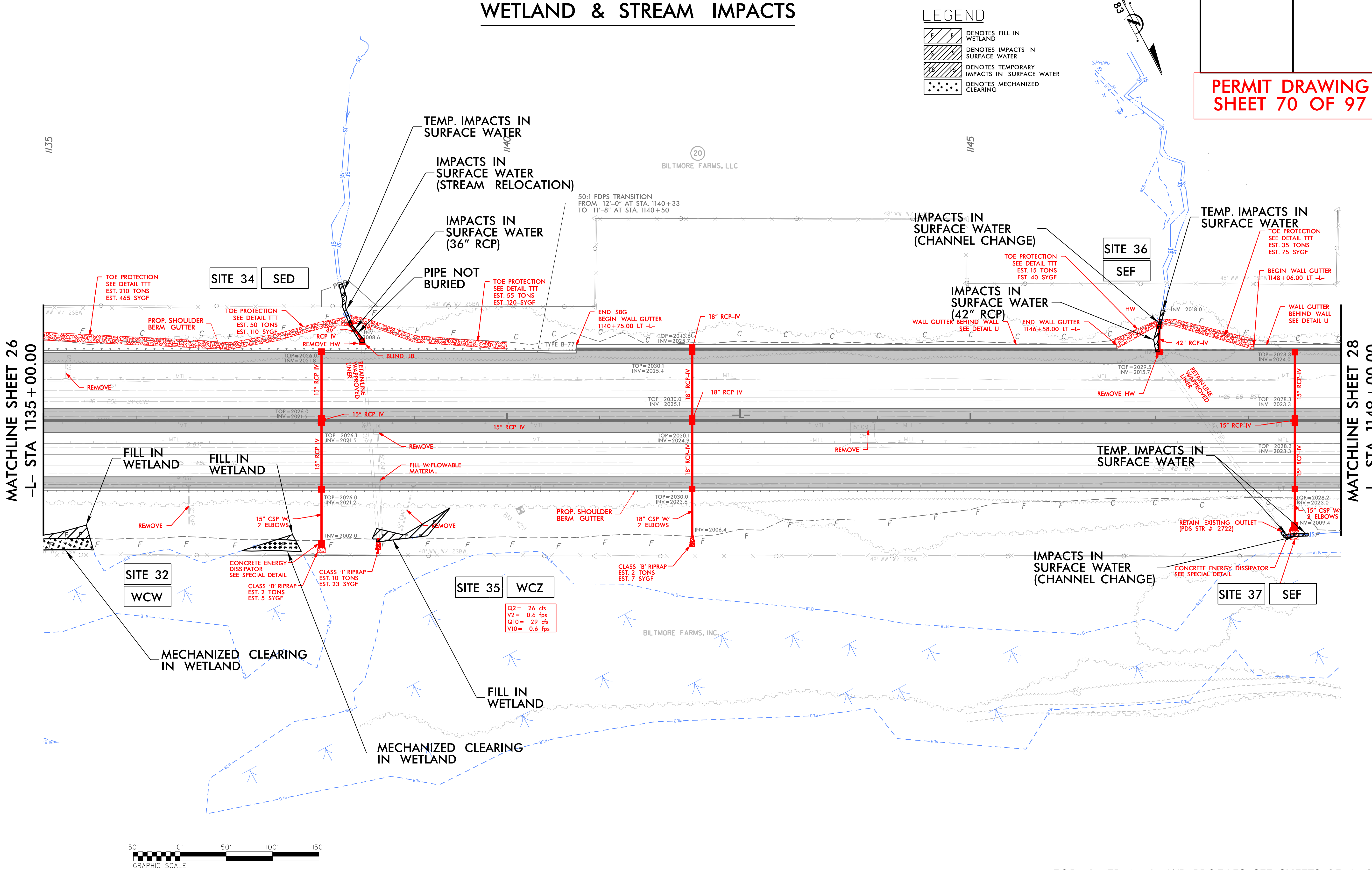
11/30/2018
I-4700B_HYD_PRM_PSH_26_PFL.dgn
HNTB

PROJECT REFERENCE NO.	SHEET NO.
I-4700	27
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HNTB

PERMIT DRAWING
SHEET 70 OF 97

WETLAND & STREAM IMPACTS



LEGEND
DENOTES FILL IN WETLAND
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES MECHANIZED CLEARING
NAD 83
TEMP. IMPACTS IN SURFACE WATER
IMPACTS IN SURFACE WATER (STREAM RELOCATION)
IMPACTS IN SURFACE WATER (36" RCP)
PIPE NOT BURIED
50:1 FDPS TRANSITION FROM 12'-0" AT STA. 1140+33 TO 11'-8" AT STA. 1140+50
BILTMORE FARMS, LLC
IMPACTS IN SURFACE WATER (CHANNEL CHANGE)
TEMP. IMPACTS IN SURFACE WATER
SITE 36
SEF
IMPACTS IN SURFACE WATER (42" RCP)
SITE 34
SED
TOE PROTECTION SEE DETAIL TTT EST. 210 TONS EST. 465 SYGF
TOE PROTECTION SEE DETAIL TTT EST. 50 TONS EST. 110 SYGF
TOE PROTECTION SEE DETAIL TTT EST. 55 TONS EST. 120 SYGF
TOE PROTECTION SEE DETAIL TTT EST. 15 TONS EST. 40 SYGF
TOE PROTECTION SEE DETAIL TTT EST. 35 TONS EST. 75 SYGF
PROP. SHOULDER BERM GUTTER
END SBG BEGIN WALL GUTTER 1140+75.00 LT -L-
BEGIN WALL GUTTER 1148+06.00 LT -L-
WALL GUTTER BEHIND WALL SEE DETAIL U
END WALL GUTTER 1146+58.00 LT -L-
MATCHLINE SHEET 26 -L- STA 1135+00.00
MATCHLINE SHEET 28 -L- STA 1149+00.00
FILL IN WETLAND
TEMP. IMPACTS IN SURFACE WATER
SITE 32
WCW
SITE 35
WCZ
Q2= 26 cfs
V2= 0.6 fps
Q10= 29 cfs
V10= 0.6 fps
CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL
CLASS 'B' RIPRAP EST. 2 TONS EST. 5 SYGF
CLASS 'I' RIPRAP EST. 10 TONS EST. 23 SYGF
CLASS 'B' RIPRAP EST. 2 TONS EST. 7 SYGF
RETAIN EXISTING OUTLET (PDS STR # 2722)
IMPACTS IN SURFACE WATER (CHANNEL CHANGE)
SITE 37
SEF
BILTMORE FARMS, INC.
MECHANIZED CLEARING IN WETLAND
FILL IN WETLAND
MECHANIZED CLEARING IN WETLAND
GRAPHIC SCALE

FOR -L- EB & -L- WB PROFILES, SEE SHEETS 85 & 86
FOR RETAINING WALL -RW16-, SEE SHEETS W-18
FOR RETAINING WALL -RW17-, SEE SHEETS W-19

7/19/2017
11/30/2008
I4700B_HYD_PRM_PSH_27.dgn

7/19/2017

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

PROJECT REFERENCE NO.	SHEET NO.
I-4700	27
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 71 OF 97

WETLAND & STREAM IMPACTS

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

NAD 83

MATCHLINE SHEET 26
–L– STA 1135+00.00

MATCHLINE SHEET 28
–L– STA 1149+00.00

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

IMPACTS IN SURFACE WATER (36" RCP)

PIPE NOT BURIED

50:1 FDPS TRANSITION FROM 12'-0" AT STA. 1140+33 TO 11'-8" AT STA. 1140+50

SITE 34 SED

TOE PROTECTION SEE DETAIL TTT EST. 210 TONS EST. 465 SYGF

PROP. SHOULDER BERM GUTTER

TOE PROTECTION SEE DETAIL TTT EST. 50 TONS EST. 110 SYGF

RCP-IV

REMOVE HW

BLIND JB

TOE PROTECTION SEE DETAIL TTT EST. 55 TONS EST. 120 SYGF

END SBG
BEGIN WALL GUTTER 1140+75.00 LT –L–

TYPE B-77

18" RCP-IV

TOP=2043.6
INV=2025.7

TOP=2030.1
INV=2025.4

TOP=2030.0
INV=2025.1

18" RCP-IV

18" RCP-IV

15" RCP-IV

TOP=2026.0
INV=2021.8

TOP=2026.0
INV=2021.5

TOP=2026.1
INV=2021.5

TOP=2026.0
INV=2021.2

INV=2002.0

REMOVE

REMOVE

REMOVE

FILL W/FLOWABLE MATERIAL

RETAINING LINER (REMOVED UNDER FILL)

15" RCP-IV

15" RCP-IV

15" RCP-IV

FILL IN WETLAND

FILL IN WETLAND

REMOVE

15" CSP W/ 2 ELBOWS

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

CLASS 'I' RIPRAP EST. 10 TONS EST. 23 SYGF

CLASS 'B' RIPRAP EST. 2 TONS EST. 5 SYGF

SITE 32 WCW

MECHANIZED CLEARING IN WETLAND

MECHANIZED CLEARING IN WETLAND

FILL IN WETLAND

SITE 35 WCZ

Q2= 26 cfs
V2= 0.6 fps
Q10= 29 cfs
V10= 0.6 fps

PROP. SHOULDER BERM GUTTER

18" CSP W/ 2 ELBOWS

INV=2006.4

CLASS 'B' RIPRAP EST. 2 TONS EST. 7 SYGF

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

SITE 36 SEF

TOE PROTECTION SEE DETAIL TTT EST. 15 TONS EST. 40 SYGF

IMPACTS IN SURFACE WATER (42" RCP)

WALL GUTTER BEHIND WALL SEE DETAIL U

END WALL GUTTER 1146+58.00 LT –L–

HW

INV=2018.0

42" RCP-IV

REMOVE HW

TOP=2029.5
INV=2015.7

RETAINING LINER REMOVED

TEMP. IMPACTS IN SURFACE WATER

TOE PROTECTION SEE DETAIL TTT EST. 35 TONS EST. 75 SYGF

BEGIN WALL GUTTER 1148+06.00 LT –L–

WALL GUTTER BEHIND WALL SEE DETAIL U

TOP=2028.3
INV=2024.0

TOP=2028.3
INV=2023.3

TOP=2028.3
INV=2023.3

15" RCP-IV

15" RCP-IV

TOP=2028.2
INV=2023.0

15" CSP W/ 2 ELBOWS

INV=2009.4

RETAIN EXISTING OUTLET (PDS STR # 2722)

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

SITE 37 SEF

BILTMORE FARMS, INC.

BILTMORE FARMS, LLC

SPRING

50' 0' 50' 100' 150'
GRAPHIC SCALE

FOR –L– EB & –L– WB PROFILES, SEE SHEETS 85 & 86
FOR RETAINING WALL –RW16–, SEE SHEETS W-18
FOR RETAINING WALL –RW17–, SEE SHEETS W-19

11/30/2018
3:47:08 PM
HNTB
I-4700_HYD_PRM_PSH_27.dgn

HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554	PROJECT REFERENCE NO.	SHEET NO.
	I-4700	27
	RW SHEET NO.	I-4700B-37
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	

NAD 83

PERMIT DRAWING SHEET 72 OF 97

I-4700 27
I-4700B-37

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

PIPE NOT BURIED

IMPACTS IN SURFACE WATER (36" RCP)

SITE 34 | SED

PROP. GUARDRA

TOE PROTECTION
SEE DETAIL TTT
EST. 50 TONS
EST. 110 SYGF

36" RCP–IV
REMOVE HW

HW

BLIND JB

15" RCP–IV

RETAIN/LINE W/APPROVED LINER

1137 + 00 | 1138 + 00 | 1139 + 00 | 1140 + 00

15" RCP–IV

15" RCP–IV

REMOVE

FILL W/FLOWABLE MATERIAL

MATCHLINE SHEET 28
–L– STA 1149 + 00.00

12" CMP

REMOVE

48" WW W/ 2SBW

CLASS 'I' RIPRAP
EST. 10 TONS
EST. 23 SYGF

FILL IN WETLAND

SITE 35 | WCZ

LEGEND

- F F — DENOTES FILL IN WETLAND
- S S — DENOTES IMPACTS IN SURFACE WATER
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

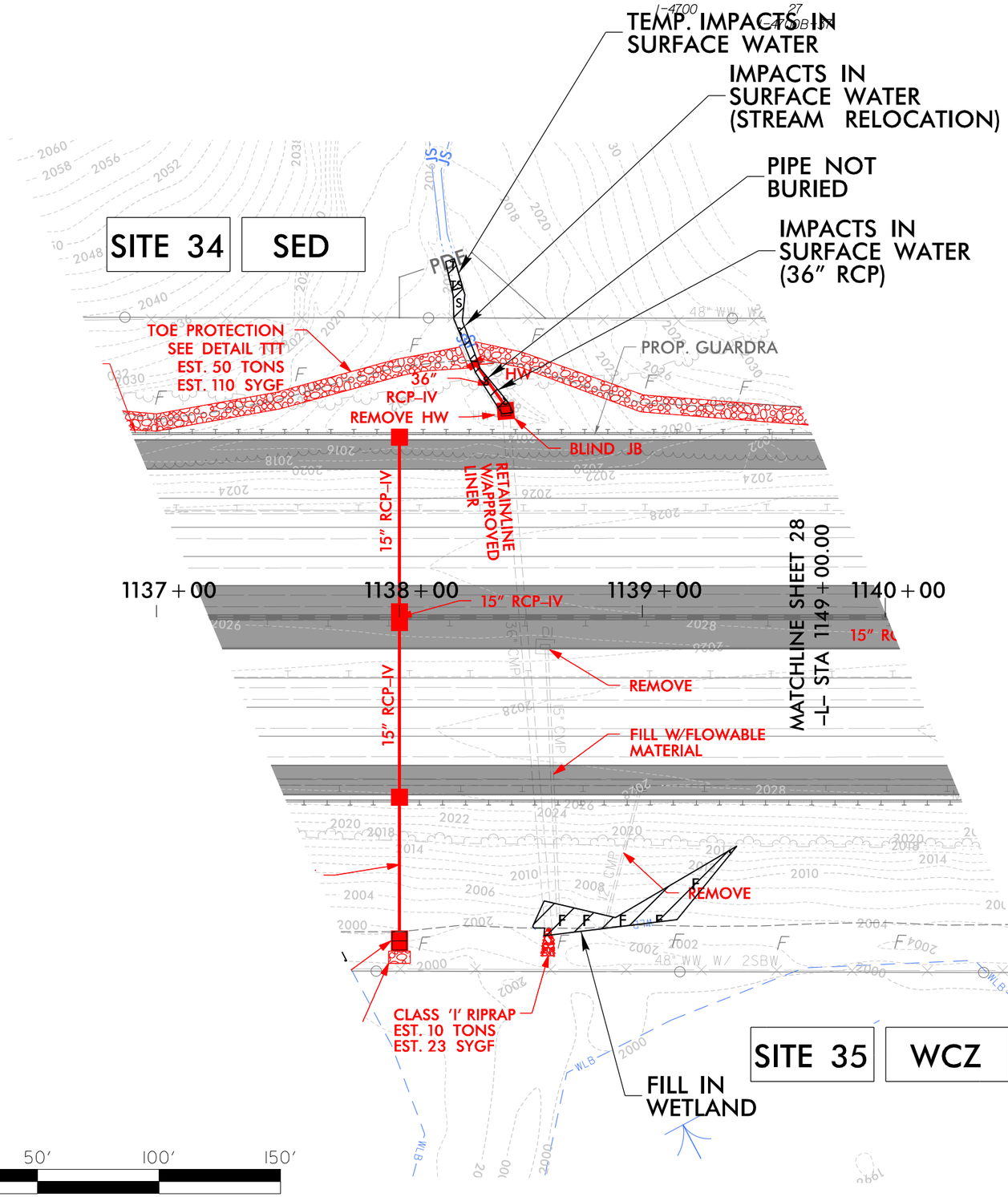
50′ 0′ 50′ 100′ 150′
GRAPHIC SCALE

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

HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554	PROJECT REFERENCE NO.	SHEET NO.
	I-4700	27
	RW SHEET NO.	I-4700B-37
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER	

NAD 83

PERMIT DRAWING SHEET 73 OF 97



LEGEND

- F F — DENOTES FILL IN WETLAND
- S S — DENOTES IMPACTS IN SURFACE WATER
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50′ 0′ 50′ 100′ 150′

GRAPHIC SCALE

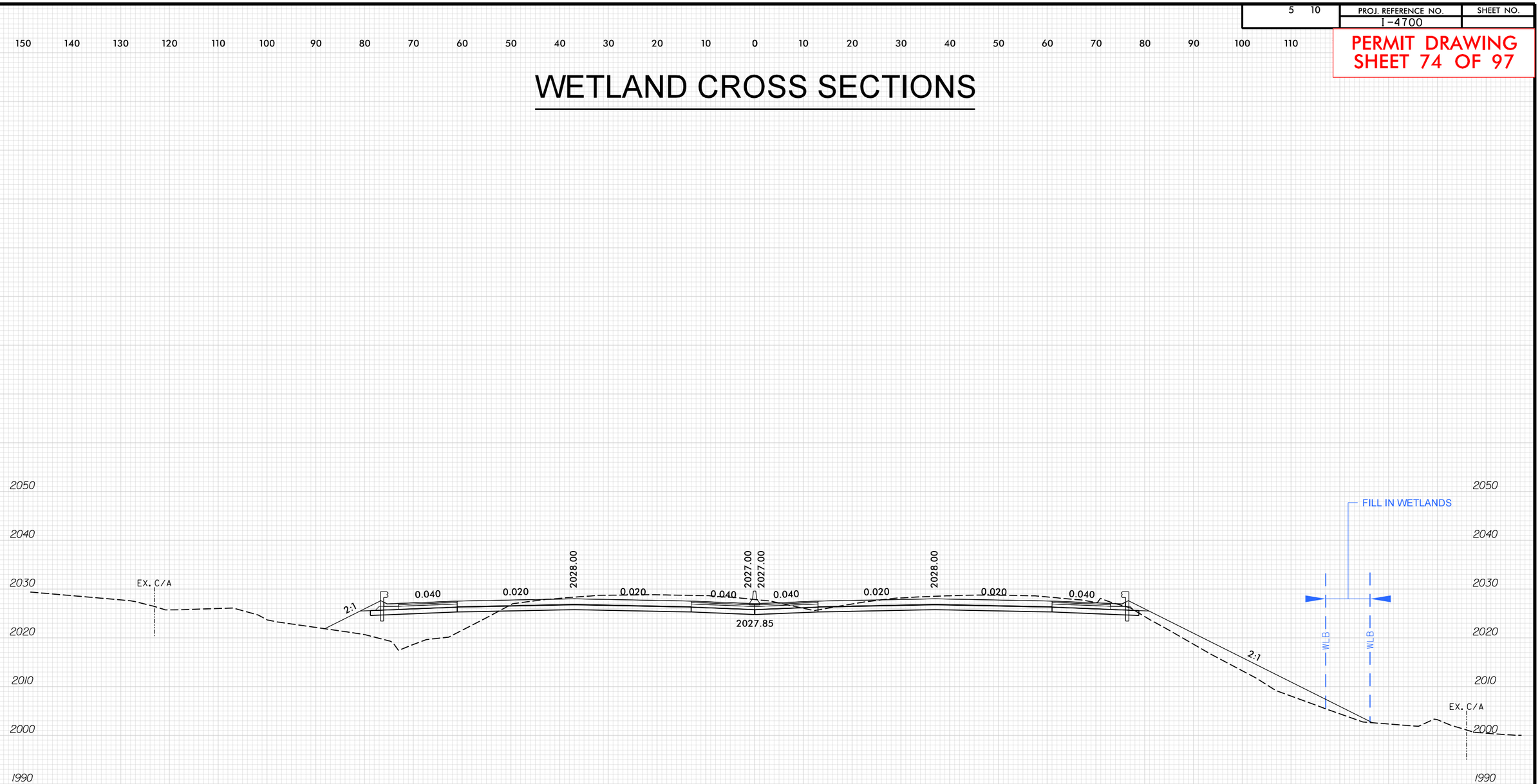
FOR –L– EB & –L– WB PROFILES, SEE SHEETS 55 & 56
FOR RETAINING WALL –RW16–, SEE SHEETS W–17
FOR RETAINING WALL –RW17–, SEE SHEETS W–18

6/23/16

PROJ. REFERENCE NO.	SHEET NO.
I-4700	

PERMIT DRAWING
SHEET 74 OF 97

WETLAND CROSS SECTIONS



SITE 35

–L3– 1139+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.)

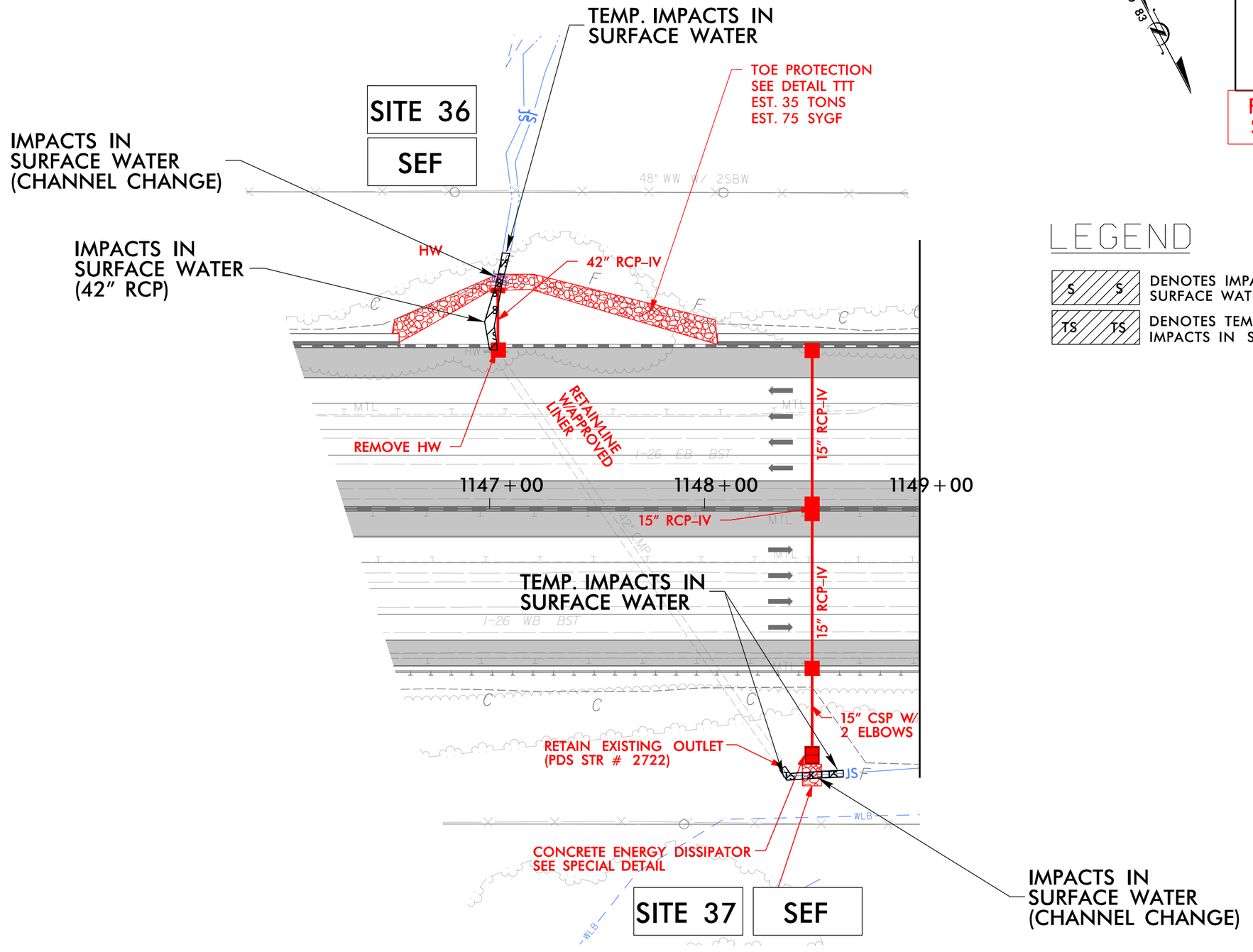
11/14/2018
I-4700B_HYD_PRM_XPL.dgn
HNTB

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

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

NAD 83

PERMIT DRAWING SHEET 75 OF 97



LEGEND

- S S — DENOTES IMPACTS IN SURFACE WATER
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

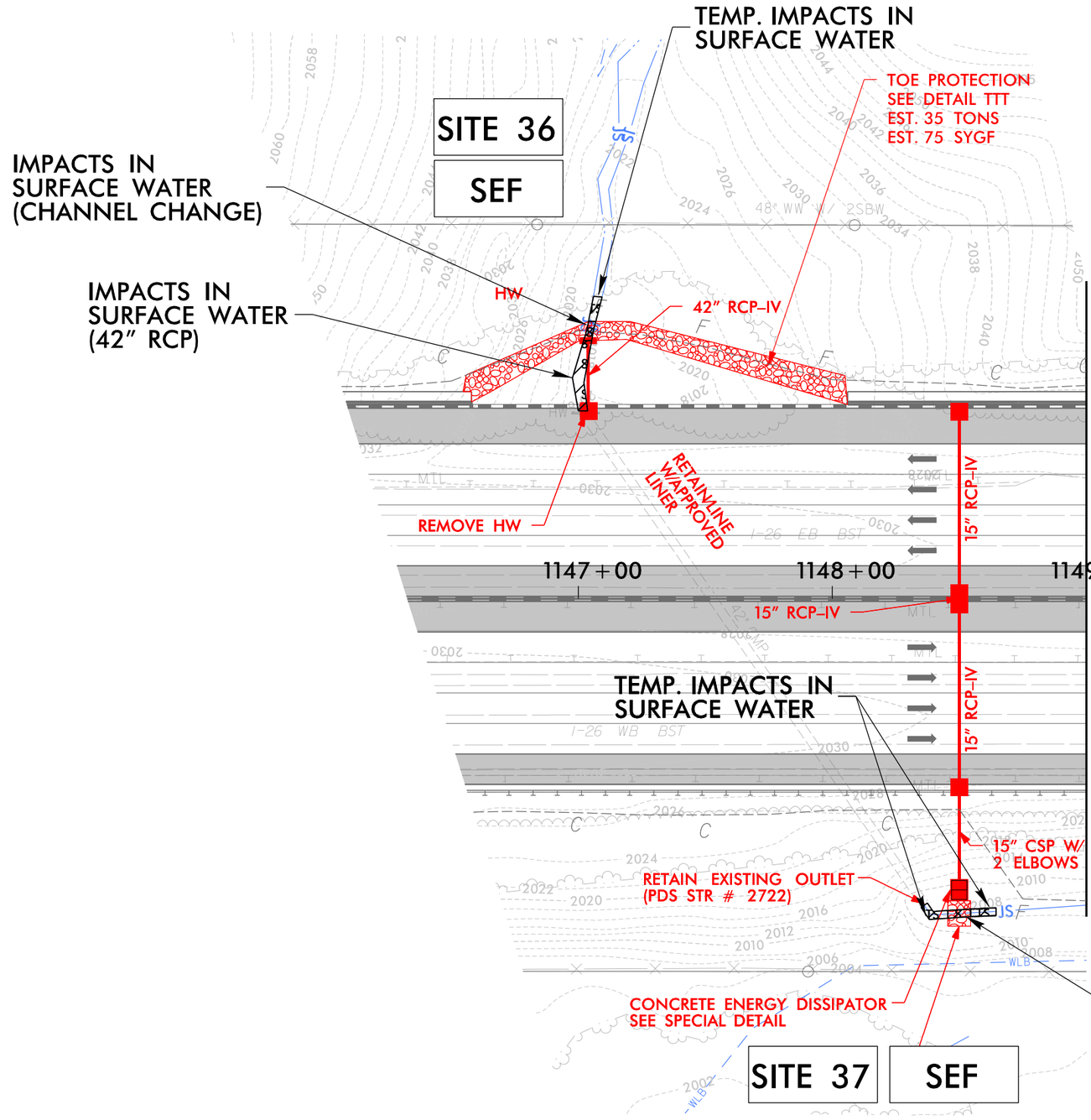
50′ 0′ 50′ 100′ 150′
GRAPHIC SCALE

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License Nos C-1554

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

NAD 83

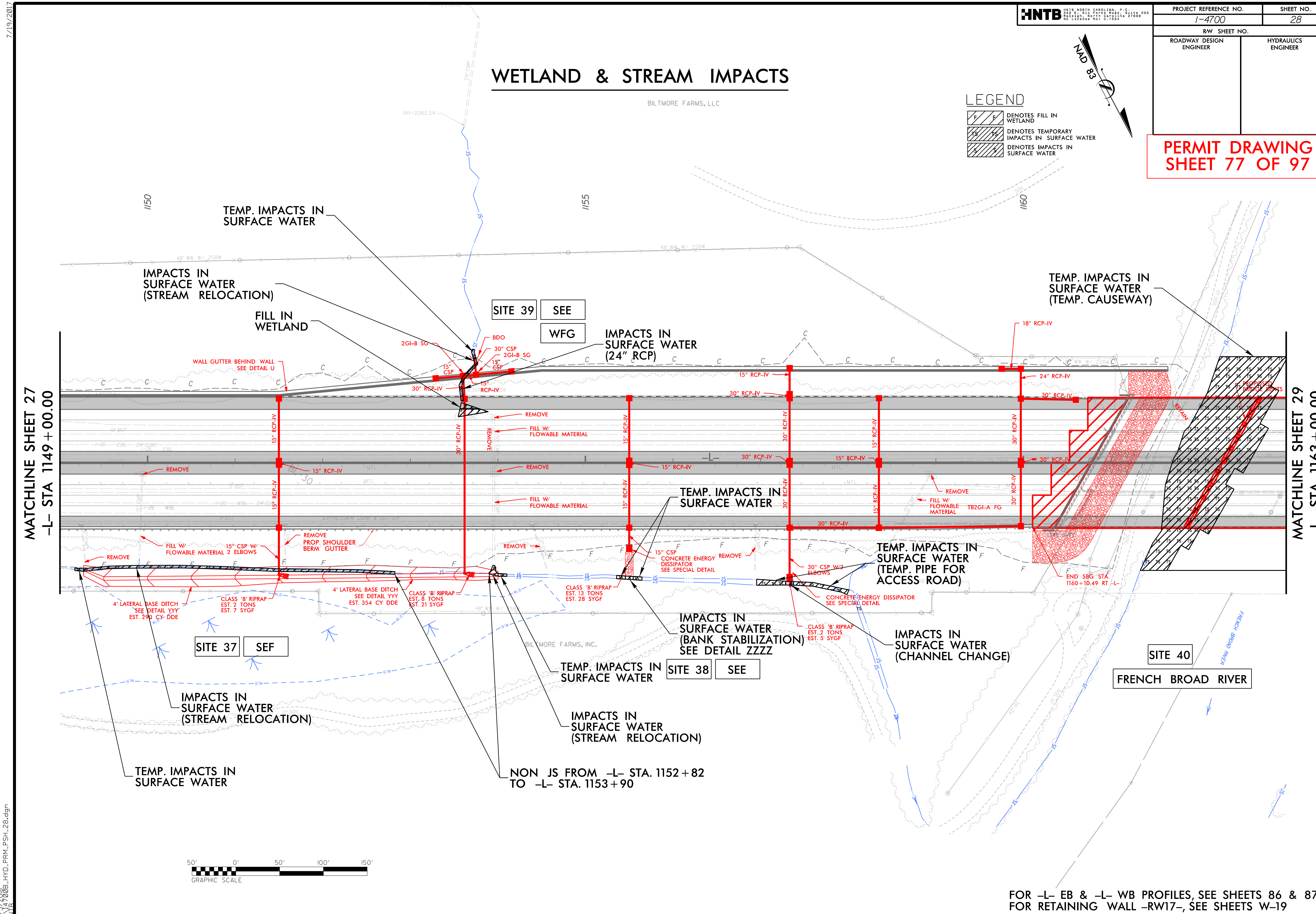
PERMIT DRAWING SHEET 76 OF 97



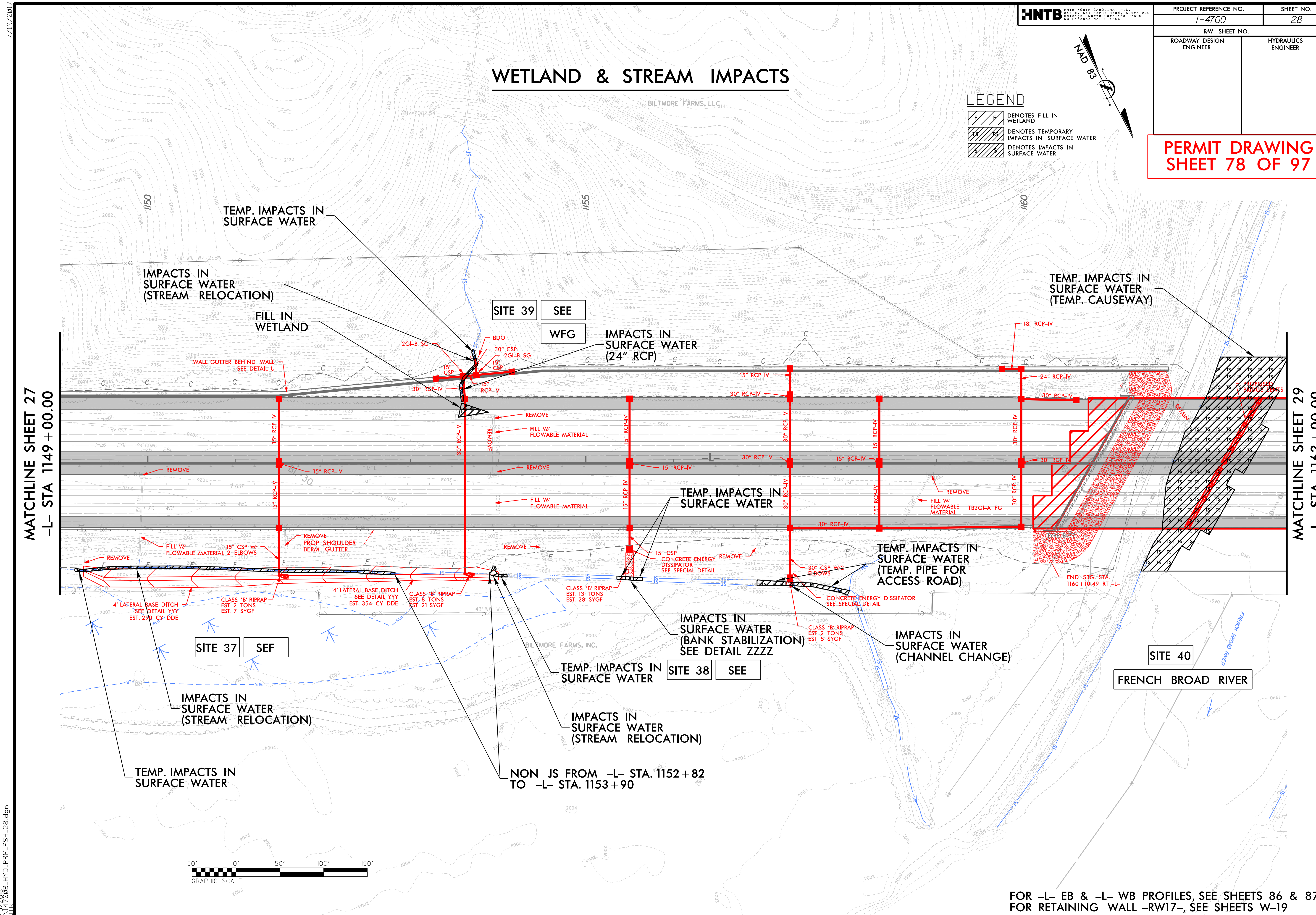
LEGEND

- S S — DENOTES IMPACTS IN SURFACE WATER
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50′ 0′ 50′ 100′ 150′
GRAPHIC SCALE



HNTB
PROJECT REFERENCE NO.
I-4700
SHEET NO.
28
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PERMIT DRAWING
SHEET 77 OF 97
WETLAND & STREAM IMPACTS
BILTMORE FARMS, LLC
LEGEND
DENOTES FILL IN WETLAND
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES IMPACTS IN SURFACE WATER
NAD 83
MATCHLINE SHEET 27
-L- STA 1149+00.00
MATCHLINE SHEET 29
-L- STA 1163+00.00
TEMP. IMPACTS IN SURFACE WATER
IMPACTS IN SURFACE WATER (STREAM RELOCATION)
FILL IN WETLAND
SITE 39
SEE
WFG
IMPACTS IN SURFACE WATER (24" RCP)
TEMP. IMPACTS IN SURFACE WATER (TEMP. CAUSEWAY)
TEMP. IMPACTS IN SURFACE WATER
TEMP. IMPACTS IN SURFACE WATER (TEMP. PIPE FOR ACCESS ROAD)
IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL ZZZZ
IMPACTS IN SURFACE WATER (CHANNEL CHANGE)
SITE 37
SEF
SITE 38
SEE
SITE 40
FRENCH BROAD RIVER
TEMP. IMPACTS IN SURFACE WATER
IMPACTS IN SURFACE WATER (STREAM RELOCATION)
IMPACTS IN SURFACE WATER (STREAM RELOCATION)
TEMP. IMPACTS IN SURFACE WATER
NON JS FROM -L- STA. 1152+82 TO -L- STA. 1153+90
BILTMORE FARMS, INC.
GRAPHIC SCALE
FOR -L- EB & -L- WB PROFILES, SEE SHEETS 86 & 87
FOR RETAINING WALL -RW17-, SEE SHEETS W-19

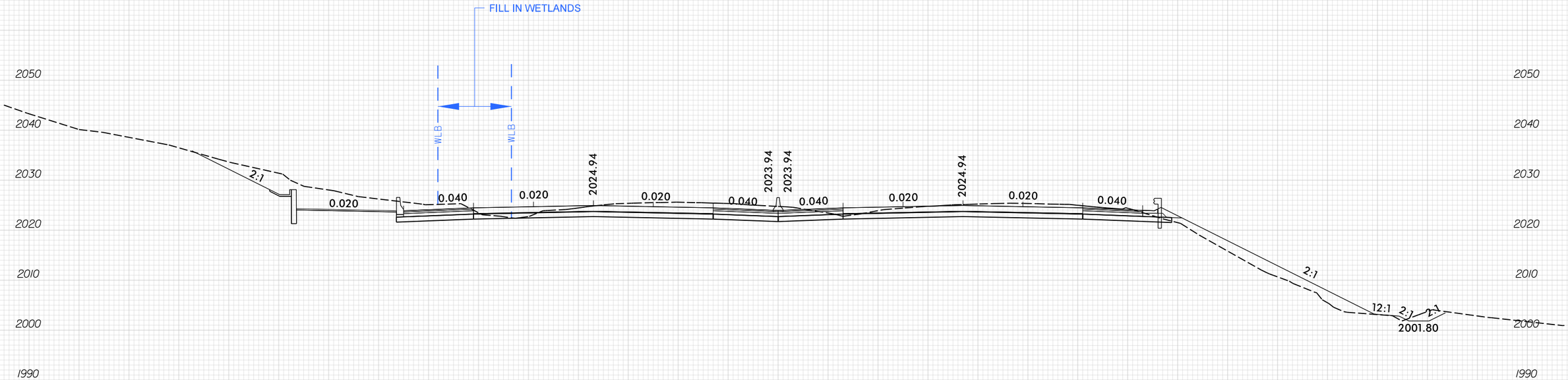

HNTB
PROJECT REFERENCE NO. I-4700
SHEET NO. 28
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
PERMIT DRAWING
SHEET 78 OF 97
WETLAND & STREAM IMPACTS
NAD 83
LEGEND
DENOTES FILL IN WETLAND
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
DENOTES IMPACTS IN SURFACE WATER
BILTMORE FARMS, LLC
BILTMORE FARMS, INC.
TEMP. IMPACTS IN SURFACE WATER
IMPACTS IN SURFACE WATER (STREAM RELOCATION)
FILL IN WETLAND
SITE 39 SEE WFG
IMPACTS IN SURFACE WATER (24" RCP)
TEMP. IMPACTS IN SURFACE WATER (TEMP. CAUSEWAY)
MATCHLINE SHEET 27 -L- STA 1149+00.00
MATCHLINE SHEET 29 -L- STA 1163+00.00
TEMP. IMPACTS IN SURFACE WATER
TEMP. IMPACTS IN SURFACE WATER (TEMP. PIPE FOR ACCESS ROAD)
IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL ZZZZ
IMPACTS IN SURFACE WATER (CHANNEL CHANGE)
SITE 37 SEF
SITE 38 SEE
SITE 40
FRENCH BROAD RIVER
TEMP. IMPACTS IN SURFACE WATER
IMPACTS IN SURFACE WATER (STREAM RELOCATION)
IMPACTS IN SURFACE WATER (STREAM RELOCATION)
TEMP. IMPACTS IN SURFACE WATER
NON JS FROM -L- STA. 1152+82 TO -L- STA. 1153+90
4' LATERAL BASE DITCH SEE DETAIL YYY EST. 290 CY DDE
CLASS 'B' RIPRAP EST. 2 TONS EST. 7 SYGF
4' LATERAL BASE DITCH SEE DETAIL YYY EST. 354 CY DDE
CLASS 'B' RIPRAP EST. 8 TONS EST. 21 SYGF
CLASS 'B' RIPRAP EST. 13 TONS EST. 28 SYGF
CLASS 'B' RIPRAP EST. 2 TONS EST. 5 SYGF
CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL
END SBG STA. 1160+10.49 RT -L-
GRAPHIC SCALE
FOR -L- EB & -L- WB PROFILES, SEE SHEETS 86 & 87
FOR RETAINING WALL -RW17-, SEE SHEETS W-19
7/19/2017
12/3/2018
I4700B_HYD_PRM_PSH_28.dgn

6/23/16

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

PERMIT DRAWING
SHEET 79 OF 97

WETLAND CROSS SECTIONS



SITE 39

–L3– 1153+60.00

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 90 100 110

11/26/2018
I-4700B_HYD_PRM_XPL.dgn
HNTB

7/19/2017

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

PROJECT REFERENCE NO.	SHEET NO.
I-4700	29
RW SHEET NO.	I-4700B-39
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 80 OF 97

WETLAND & STREAM IMPACTS

NAD 83

LEGEND

JS JS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

MATCHLINE SHEET 28
–L– STA 1163+00.00

SITE 42 SFO

SITE 40
FRENCH BROAD RIVER

SITE 41 SFG

BILTMORE FARMS, INC.

COUNTY OF BUNCOMBE

WEST RANGE, LLC

ASHEVILLE CITY LIMITS

1165 1170 1175

TEMP. IMPACTS IN SURFACE WATER (TEMP. CAUSEWAY)

TEMP. IMPACTS IN SURFACE WATER (TEMP. PIPE FOR ACCESS ROAD)

TEMP. IMPACTS IN SURFACE WATER (TEMP. PIPE FOR ACCESS ROAD)

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

PROPOSED BRIDGE BENTS

CLASS 'B' RIPRAP
EST. 1 TONS
EST. 5 SYGF

REMOVE

15" RCP–IV

15" CSP

2' SPEC. LAT. BASE DITCH
SEE DETAIL ZZZ
EST. 35 TONS
EST. 72 SYGF
EST. 721 CY DDE

BEGIN SBG STA.
1175+00.00 LT –L–

BEGIN SBG STA.
1170+00.00 RT –L–

END SBG
BEGIN WALL GUTTER
STA 1172+00.00 RT –L–

CONCRETE ENERGY DISSIPATOR
SEE SPECIAL DETAIL

CLASS 'B' RIPRAP
EST. 7 TONS
EST. 16 SYGF

MATCHLINE SHEET 30
–L– STA 1175+50.00

48" WW W/ ISBW

TYPE B-77

I-26 EB BST

I-26 EBL 24" CONC

I-26 WB BST

I-26 WBL 24" CONC

50' 0' 50' 100' 150'
GRAPHIC SCALE

FOR –L– EB & –L– WB PROFILES, SEE SHEETS 57 & 58
FOR RETAINING WALL –RW18–, SEE SHEETS W–19
FOR RETAINING WALL –RW19–, SEE SHEETS W–20
FOR RETAINING WALL –RW20–, SEE SHEETS W–21

11/14/2018
I-4700B_HYD_PRM_PSH_29.dgn
HNTB

7/19/2017

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343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	29
RW SHEET NO.	I-4700B-39
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83

PERMIT DRAWING
SHEET 81 OF 97

WETLAND & STREAM IMPACTS

LEGEND
JS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

MATCHLINE SHEET 28
–L– STA 1163+00.00

MATCHLINE SHEET 30
–L– STA 1175+50.00

SITE 42 SFO

SITE 41 SFG

SITE 40
FRENCH BROAD RIVER

BILTMORE FARMS, INC.

COUNTY OF BUNCOMBE

WEST RANGE, LLC

ASHEVILLE CITY LIMITS

TEMP. IMPACTS IN SURFACE WATER (TEMP. CAUSEWAY)

TEMP. IMPACTS IN SURFACE WATER (TEMP. PIPE FOR ACCESS ROAD)

TEMP. IMPACTS IN SURFACE WATER (TEMP. PIPE FOR ACCESS ROAD)

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

PROPOSED BRIDGE BENTS

CLASS 'B' RIPRAP
EST. 1 TONS
EST. 5 SYGF

REMOVE

15" RCP–IV

2' SPEC. LAT. BASE DITCH
SEE DETAIL ZZZ
EST. 35 TONS
EST. 72 SYGF
EST. 721 CY DDE

BEGIN SBG STA.
1175+00.00 LT –L–

TYPE B–77

END SBG
BEGIN WALL GUTTER
STA 1172+00.00 RT –L–

15" CSP

CONCRETE ENERGY DISSIPATOR
SEE SPECIAL DETAIL

CLASS 'B' RIPRAP
EST. 7 TONS
EST. 16 SYGF

BEGIN SBG STA.
1170+00.00 RT –L–

50' 0' 50' 100' 150'
GRAPHIC SCALE

FOR –L– EB & –L– WB PROFILES, SEE SHEETS 57 & 58
FOR RETAINING WALL –RW18–, SEE SHEETS W–19
FOR RETAINING WALL –RW19–, SEE SHEETS W–20
FOR RETAINING WALL –RW20–, SEE SHEETS W–21

11/14/2018
I-4700B_HYD_PRM_PSH_29.dgn
HNTB

6/23/16

PROJ. REFERENCE NO.	SHEET NO.
I-4700	

PERMIT DRAWING
SHEET 82 OF 97

250 200 150 100 50 ℄ 50 100 150 200 250

2040 2030 2020 2010 2000 1990

BEGIN BRIDGE
–L– 1160+76.56

(+)0.6000%

PROFILE GRADE LINE (PGL)

℄ BRIDGE STA. = 1163+08.56 –L–
1 @ 151′–0″, 1 @ 170′–0″, 1 @ 143′–0″
STEEL GIRDER BRIDGE
SKEW = 119.5°
CROWN GRADE ELEV. = 2,026.47′

END BRIDGE
–L– 1165+40.56

(+)0.6000%

EXISTING ROADWAY

EXISTING BRIDGE

LOWEST LOW CHORD

1.5:1 SLOPE (TYP.)
NORMAL TO CAP
(CL. II RIP RAP)

NATURAL GROUND
(RT)

3′–6″
(TYP.)

ESTIMATED NORMAL
WSEL = 1994.3′

EXISTING GROUND

1.5:1 SLOPE (TYP.)
NORMAL TO CAP
(CL. II RIP RAP)

3′–6″
(TYP.)

NATURAL GROUND
(LT)

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.)

11/14/2018
I-4700B_HYD_PRM_PSH_29A_BPFL.dgn
HNTB

7/19/2017

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

PROJECT REFERENCE NO.	SHEET NO.
I-4700	30
R/W SHEET NO.	I-4700B-40
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 83 OF 97

WETLAND & STREAM IMPACTS

NAD 83

LEGEND

- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING

MATCHLINE SHEET 29 –L– STA 1175+50.00

MATCHLINE SHEET 31 –L– STA 1188+50.00

I180

I185

COUNTY OF BUNCOMBE

ASHEVILLE CITY LIMITS

DIXIE JOANN BROWN IRREVOCABLE TRUST

2' SPEC. LAT. BASE DITCH
SEE DETAIL ZZZ
EST. 35 TONS
EST. 72 SYGF
EST. 721 CY DDE

2' SPECIAL LATERAL BASE DITCH
SEE DETAIL FFF

REMOVE

PROP. SHOULDER BERM GUTTER

15" RCP-IV

24" RCP-IV

30" CSP W/1 ELBOW

30" RCP-IV

BDO REMOVE

50:1 FDPS TRANSITION FROM 12'-0" AT STA. 1183+58 TO 11'-8" AT STA. 1183+75

END SBG
BEGIN WALL GUTTER
STA. 1184+00.00 LT –L–

WALL GUTTER BEHIND WALL
SEE DETAIL U

15" CSP W/ 2 ELBOWS

24" CSP W/ 2 ELBOWS

CLASS 'B' RIPRAP
EST. 1 TONS
EST. 5 SYGF

CLASS 'B' RIPRAP
EST. 5 TONS
EST. 14 SYGF

MECHANIZED CLEARING IN WETLAND

SITE 43 | WDZ

FILL IN WETLAND

BEGIN SBG STA. 1181+30.00 RT –L–

50:1 FDPS TRANSITION FROM 11'-8" AT STA. 1181+55 TO 12'-0" AT STA. 1181+72

SPECIAL LATERAL 'V' DITCH
SEE DETAIL DDD
EST. 25 SYGF
EST. 14 CY DDE

18" RCP-IV

FILL W/FLOWABLE MATERIAL

PROP. SHOULDER BERM GUTTER

TYPE B-77

ST RANGE, LLC

STEVE A. & MARLENE V. BALDWIN

50' 0' 50' 100' 150'
GRAPHIC SCALE

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

11/30/2018
I-4700B_HYD_PRM_PSH_30.dgn
HNTB

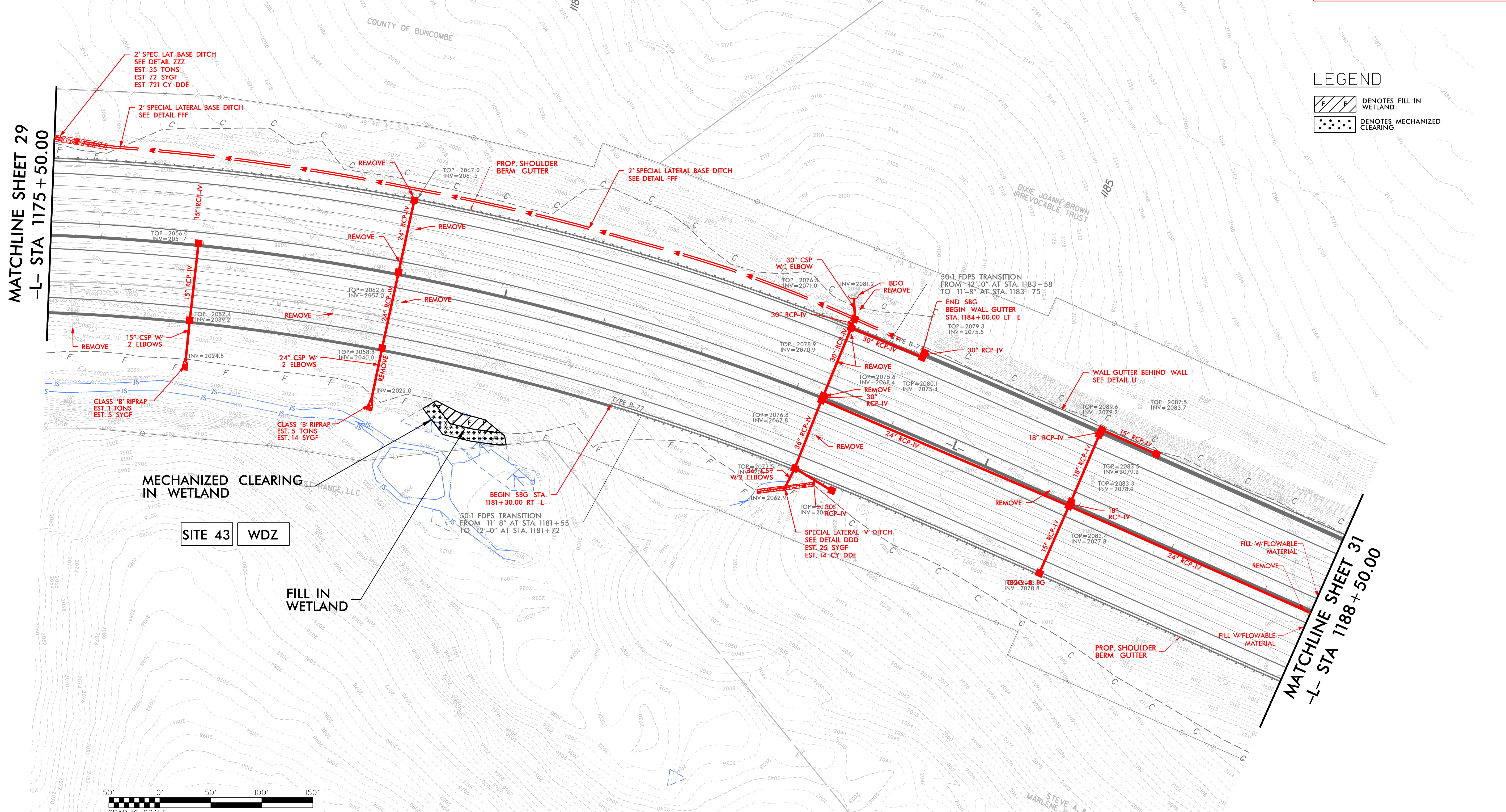
PROJECT REFERENCE NO.	SHEET NO.
I-4700	30
R/W SHEET NO.	I-4700B-40
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HNTB NORTH CAROLINA, P.C.

NAD 83

WETLAND & STREAM IMPACTS

PERMIT DRAWING
SHEET 84 OF 97



MATCHLINE SHEET 29
-L- STA 1175+50.00
MATCHLINE SHEET 31
-L- STA 1188+50.00
LEGEND
DENOTES FILL IN WETLAND
DENOTES MECHANIZED CLEARING
COUNTY OF BUNCOMBE
ASHEVILLE CITY LIMITS
DIXIE JOANN BROWN IRREVOCABLE TRUST
STEVE A. & MARLENE V. BALDWIN
2' SPEC. LAT. BASE DITCH SEE DETAIL ZZZ EST. 35 TONS EST. 72 SYGF EST. 721 CY DDE
2' SPECIAL LATERAL BASE DITCH SEE DETAIL FFF
PROP. SHOULDER BERM GUTTER
REMOVE
15" CSP W/ 2 ELBOWS
24" CSP W/ 2 ELBOWS
30" CSP W/1 ELBOW
CLASS 'B' RIPRAP EST. 1 TONS EST. 5 SYGF
CLASS 'B' RIPRAP EST. 5 TONS EST. 14 SYGF
MECHANIZED CLEARING IN WETLAND
FILL IN WETLAND
SITE 43
WDZ
BEGIN SBG STA. 1181+30.00 RT -L-
50:1 FDPS TRANSITION FROM 11'-8" AT STA. 1181+55 TO 12'-0" AT STA. 1181+72
50:1 FDPS TRANSITION FROM 12'-0" AT STA. 1183+58 TO 11'-8" AT STA. 1183+75
END SBG BEGIN WALL GUTTER STA. 1184+00.00 LT -L-
WALL GUTTER BEHIND WALL SEE DETAIL U
SPECIAL LATERAL 'V' DITCH SEE DETAIL DDD EST. 25 SYGF EST. 14 CY DDE
FILL W/FLOWABLE MATERIAL
BDO
TYPE B-77
GRAPHIC SCALE
50' 0' 50' 100' 150'

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

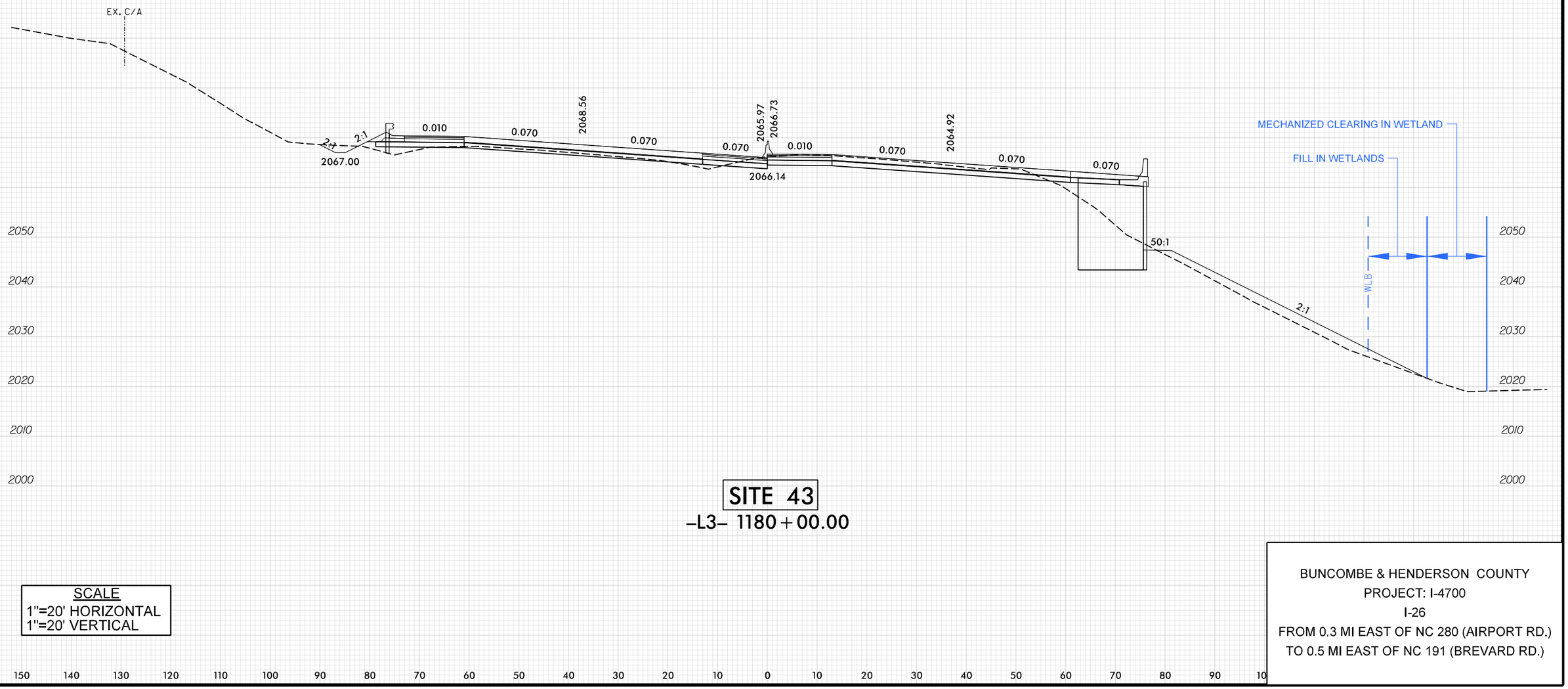
7/19/2017
11/30/2018
I4700B_HYD_PRM_PSH_30.dgn

6/23/16

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

PERMIT DRAWING
SHEET 85 OF 97

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.)

11/30/2018
I-4700B_HYD_PRM_XPL.dgn
HNYB

7/19/2017

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

PROJECT REFERENCE NO.	SHEET NO.
I-4700	31
R/W SHEET NO.	I-4700B-41
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83

PERMIT DRAWING SHEET 86 OF 97

WETLAND & STREAM IMPACTS

LEGEND

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

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

TEMP. IMPACTS IN SURFACE WATER

PIPE BURIED

SITE 45 SFR

SITE 44 SFG

MATCHLINE SHEET 30 –L– STA 1188+50.00

MATCHLINE SHEET 32 –L– STA 1202+00.00

BEGIN SBG STA. 1198+25.00 LT –L–

END SBG STA. 1193+75.00 RT –L–

END WALL GUTTER 1194+92.00 LT –L–

WALL GUTTER BEHIND WALL SEE DETAIL U

4' STD BASE DITCH SEE DETAIL WWW S = 8.9%

TOE PROTECTION SEE DETAIL AAAA EST. 250 TONS EST. 555 SYGF

PROP. SHOULDER BERM GUTTER

54" WELDED STEEL PIPE 0.75" WALL THICKNESS TRENCHLESS INSTALLATION BURY 1' BOTH ENDS

24" CSP W/ 2 ELBOWS

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

CLASS 'I' RIPRAP EST. 10 TONS EST. 25 SYGF

HW 54" RCP-IV

BLIND JB 54" RCP-IV

FILL W/FLOWABLE MATERIAL

PLUG & FILL W/FLOWABLE MATERIAL

RETAIN

REMOVE

18" RCP-IV

15" RCP-IV

24" RCP-IV

DIXIE JOANN BROWN IRREVOCABLE TRUST

WILLENA SAMS

JAMES R

OWNERSHIP UNKNOWN

STEVE A. & MARLENE V. BALDWIN

MARLENE V. & STEVE BALDWIN

VANETTE S. & STEVE A. BALDWIN

DEBORAH A. & ROY E. INGLE

50' 0' 50' 100' 150'
GRAPHIC SCALE

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

11/30/2018
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HNTB

7/19/2017

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PROJECT REFERENCE NO.	SHEET NO.
I-4700	31
R/W SHEET NO.	I-4700B-41
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 87 OF 97

WETLAND & STREAM IMPACTS

NAD 83

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

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

PIPE BURIED

SITE 45 SFR

SITE 44 SFG

BEGIN SBG STA. 1198+25.00 LT –L–

END SBG STA. 1193+75.00 RT –L–

END WALL GUTTER 1194+92.00 LT –L–

WALL GUTTER BEHIND WALL SEE DETAIL U

TOE PROTECTION SEE DETAIL AAAA EST. 250 TONS EST. 555 SYGF

PROP. SHOULDER BERM GUTTER

4' STD. BASE DITCH SEE DETAIL WWW S = 8.9%

54" WELDED STEEL PIPE 0.75" WALL THICKNESS TRENCHLESS INSTALLATION BURY 1' BOTH ENDS

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

CLASS 'I' RIPRAP EST. 10 TONS EST. 25 SYGF

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

50' 0' 50' 100' 150'
GRAPHIC SCALE

11/30/2018
I-4700B_HYD_PRM_PSH_31.dgn
HNTB

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NC License No: C-1554

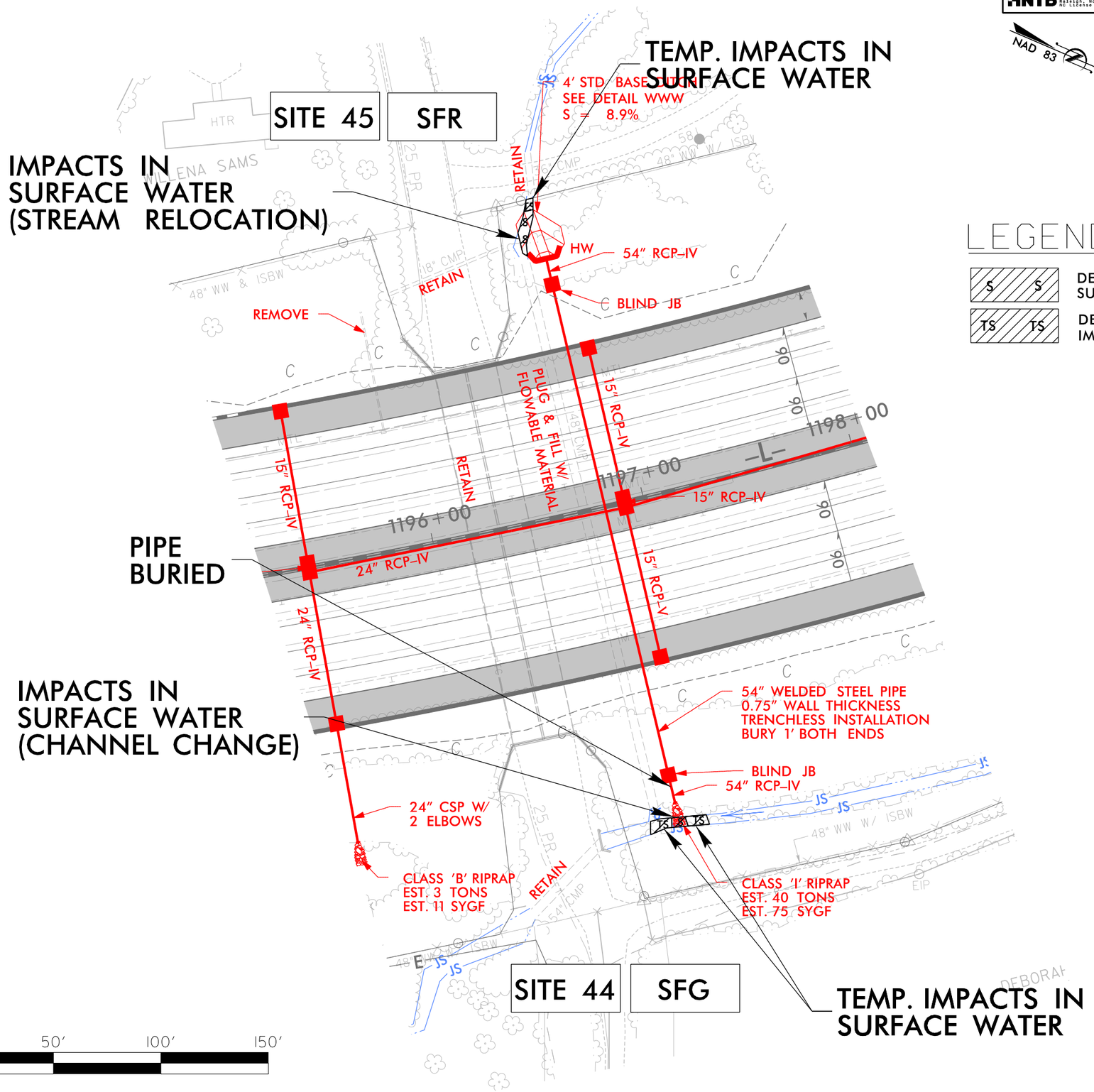
PROJECT REFERENCE NO.	SHEET NO.
I-4700	31
RW SHEET NO.	I-4700B-41
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83

PERMIT DRAWING SHEET 88 OF 97

LEGEND

- S S — DENOTES IMPACTS IN SURFACE WATER
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER



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NC License No: C-1554

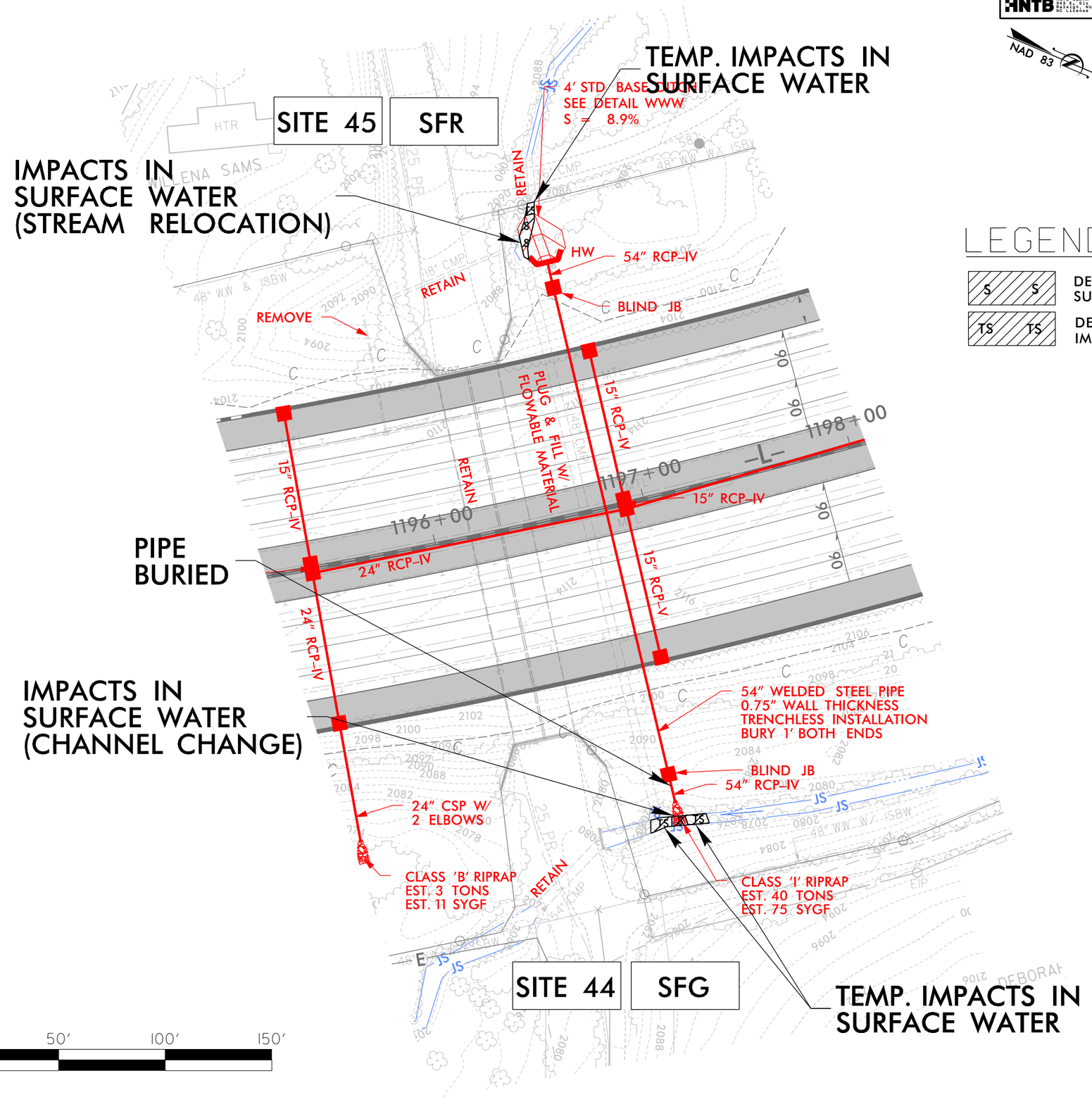
PROJECT REFERENCE NO.	SHEET NO.
I-4700	31
RW SHEET NO.	I-4700B-41
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83

PERMIT DRAWING SHEET 89 OF 97

LEGEND

- S S — DENOTES IMPACTS IN SURFACE WATER
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER



50' 0' 50' 100' 150'

GRAPHIC SCALE

7/19/2017

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

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

PERMIT DRAWING
SHEET 90 OF 97

WETLAND & STREAM IMPACTS

NAD 83

LEGEND

DENOTES IMPACTS IN SURFACE WATER

ASHEVILLE CITY LIMITS

SCHRADER

ISBLKBUS

1205

1210

1215

MISSION HEALTH, INC.

WEST RANGE, LLC

VANETTE S. & STEVE A. BALDWIN

MATCHLINE SHEET 31
–L– STA 1202+00.00

MATCHLINE SHEET 33
–L– STA 1215+00.00

4' LATERAL BASE DITCH
SEE DETAIL BBBB
EST. 70 TONS
EST. 150 SYGF
EST. 3156 CY DDE

4' SPECIAL LATERAL BASE DITCH
SEE DETAIL CCCC
EST. 95 TONS
EST. 215 SYGF

TOE PROTECTION
SEE DETAIL AAAA
EST. 40 TONS
EST. 95 SYGF

REMOVE

36" RCP-IV
BLIND JB

15" RCP-IV

15" RCP-IV

TB2GI-B FG

36" WELDED STEEL PIPE
0.50" WALL THICKNESS
TRENCHLESS INSTALLATION

REMOVE

18" RCP-IV

REMOVE

15" RCP-IV

FILL W/ FLOWABLE MATERIAL

PROP. SHOULDER BERM GUTTER

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

15" RCP-IV

15" RCP-IV

REMOVE

FILL W/ FLOWABLE MATERIAL

TYPE B-77

BEGIN SBG STA. 1206+75.00RT –L–

15" CSP

BLIND JB

36" RCP-IV

15" CSP W/ 2 ELBOWS

15" CSP W/ 2 ELBOWS

CLASS 'B' RIPRAP
EST. 2 TONS
EST. 7 SYGF

CLASS 'I' RIPRAP
EST. 10 TONS
EST. 23 SYGF

50:1 FDPS TRANSITION
FROM 11'-8" AT STA. 1207+00
TO 12'-0" AT STA. 1207+17

CLASS 'B' RIPRAP
EST. 1 TONS
EST. 5 SYGF

CLASS 'B' RIPRAP
EST. 1 TONS
EST. 5 SYGF

BLIND JB
42" RCP-IV

CLASS 'I' RIPRAP
EST. 11 TONS
EST. 16 SYGF

STANDARD V DITCH
SEE DETAIL ??
EST. XX CY DDE
S = X.X%
V = X.X fps
D = X.X ft

SITE 46
SFQ

PIPE NOT BURIED

IMPACTS IN SURFACE WATER (42" RCP)

50' 0' 50' 100' 150'
GRAPHIC SCALE

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

11/30/2018
I-4700B_HYD_PRM_PSH_32.dgn
HNTB

7/19/2017

HNTB NORTH CAROLINA, P.C.
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Raleigh, North Carolina 27609
NC License No: C-1554

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

PERMIT DRAWING
SHEET 91 OF 97

WETLAND & STREAM IMPACTS

NAD 83

LEGEND

DENOTES IMPACTS IN SURFACE WATER

MATCHLINE SHEET 31
–L– STA 1202+00.00

MATCHLINE SHEET 33
–L– STA 1215+00.00

ASHEVILLE CITY LIMITS

SCHRADER

MISSION HEALTH, INC.

WEST RANGE, LLC

VANETTE S. & STEVE A. BALDWIN

1205

1210

1215

4' LATERAL BASE DITCH
SEE DETAIL BBBB
EST. 70 TONS
EST. 150 SYGF
EST. 3156 CY DDE

4' SPECIAL LATERAL BASE DITCH
SEE DETAIL CCCC
EST. 95 TONS
EST. 215 SYGF

TOE PROTECTION
SEE DETAIL AAAA
EST. 40 TONS
EST. 95 SYGF

REMOVE

HW

36" RCP-IV
BLIND JB

15" RCP-IV

TB2GI-B FG

36" WELDED STEEL PIPE
0.50" WALL THICKNESS
TRENCHLESS INSTALLATION

18" RCP-IV

FLOWABLE MATERIAL FILL W/

TYPE B-77

BEGIN SBG STA. 1206+75.00RT –L–

15" CSP

BLIND JB

36" RCP-IV

CLASS 'B' RIPRAP
EST. 2 TONS
EST. 7 SYGF

CLASS 'I' RIPRAP
EST. 10 TONS
EST. 23 SYGF

STANDARD 'V' DITCH
SEE DETAIL ??
EST. XX CY DDE
S = X.X%
V = X.X fps
D = X.X ft

50:1 FDPS TRANSITION
FROM 11'–8" AT STA. 1207+00
TO 12'–0" AT STA. 1207+17

15" CSP W/
2 ELBOWS

CLASS 'B' RIPRAP
EST. 1 TONS
EST. 5 SYGF

PROP. SHOULDER
BERM GUTTER

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

FILL W/
FLOWABLE MATERIAL

BLIND JB
42" RCP-IV

CLASS 'I' RIPRAP
EST. 11 TONS
EST. 16 SYGF

SITE 46
SFQ

PIPE NOT BURIED

IMPACTS IN SURFACE WATER (42" RCP)

50' 0' 50' 100' 150'
GRAPHIC SCALE

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

11/30/2016
I-4700B_HYD_PRM_PSH_32.dgn
HNTB

7/19/2017

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Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	33
R/W SHEET NO.	I-4700B-43
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 92 OF 97

WETLAND & STREAM IMPACTS

NAD 83

LEGEND

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

TEMP. IMPACTS IN SURFACE WATER

SITE 47 | SFQ

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

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

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

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AAAA

42" RCP-IV BLIND JB

IMPACTS IN SURFACE WATER (42" RCP)

PIPE NOT BURIED

BERM DITCH SEE DETAIL D

PROP. SHOULDER BERM GUTTER

15" RCP-IV

18" RCP-IV

FS-1

REMOVE

24" RCP-IV

MATCHLINE SHEET 32
-L- STA 1215+00.00

MATCHLINE SHEET 34
-L- STA 1228+50.00

RIDGEFIELD BUSINESS CENTER I PROPERTY OWNERS ASSOCIATION, INC.

WEST RANGE, LLC

50' 0' 50' 100' 150'
GRAPHIC SCALE

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

11/30/2016
I-4700B_HYD_PRM_PSH_33.dgn
HNTB

7/19/2017

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

PROJECT REFERENCE NO.	SHEET NO.
I-4700	33
R/W SHEET NO.	I-4700B-43
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 93 OF 97

WETLAND & STREAM IMPACTS

NAD 83

LEGEND

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

TEMP. IMPACTS IN SURFACE WATER

SITE 47 | SFQ

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

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

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

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AAAA

12" RCP-IV BLIND JB

BERM DITCH SEE DETAIL D

IMPACTS IN SURFACE WATER (42" RCP)

PIPE NOT BURIED

PROP. SHOULDER BERM GUTTER

15" RCP-IV

18" RCP-IV

FS-1

REMOVE

24" RCP-IV

MATCHLINE SHEET 32 –L– STA 1215+00.00

MATCHLINE SHEET 34 –L– STA 1228+50.00

50' 0' 50' 100' 150'
GRAPHIC SCALE

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

11/30/2016
I-4700B_HYD_PRM_PSH_33.dgn
HNTB

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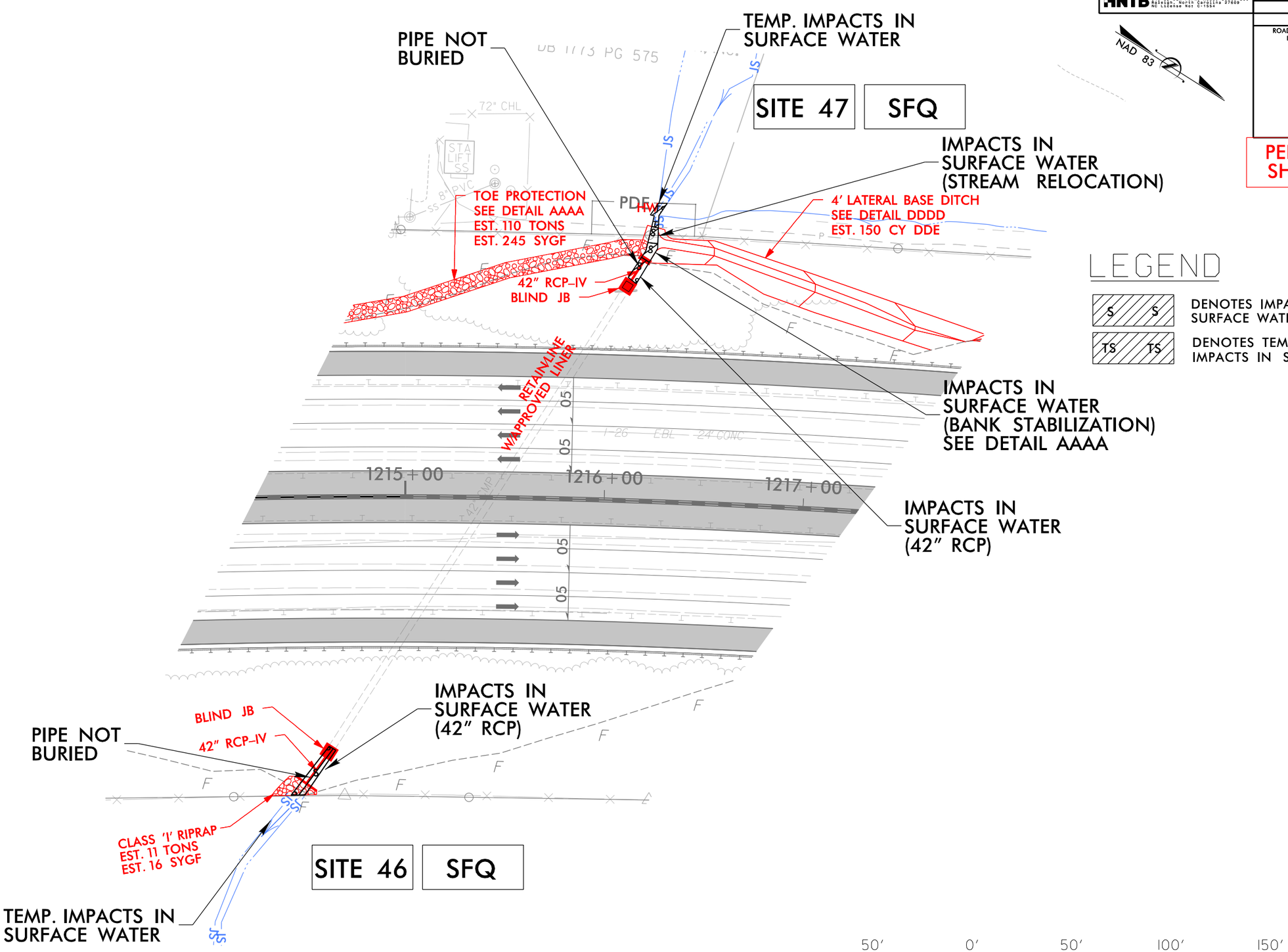
343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	33
R/W SHEET NO.	I-4700B-43
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 94 OF 97

NAD 83



LEGEND

S S	DENOTES IMPACTS IN SURFACE WATER
TS TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50' 0' 50' 100' 150'
GRAPHIC SCALE

HNTB NORTH CAROLINA, P.C.
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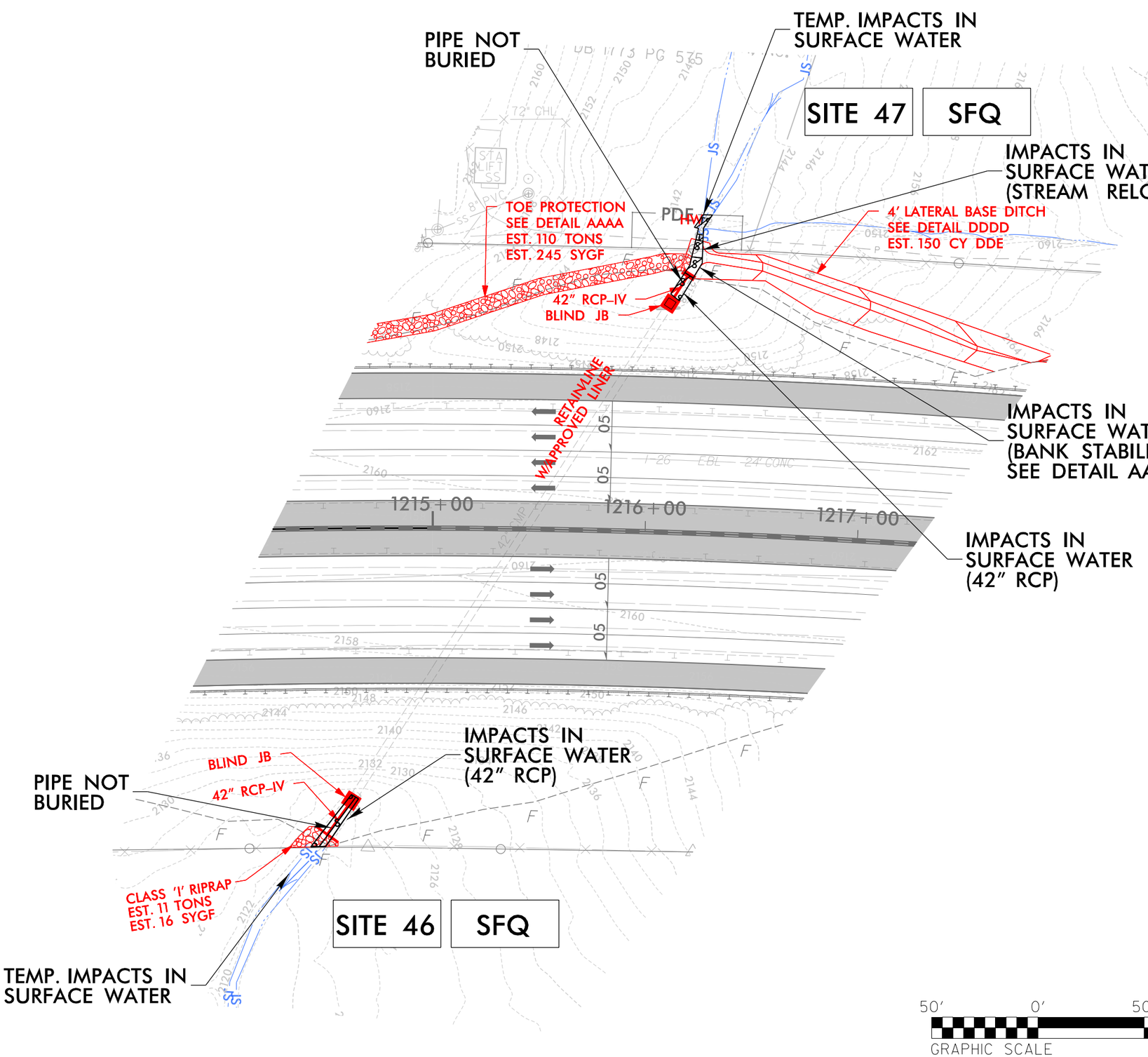
PROJECT REFERENCE NO.	SHEET NO.
I-4700	33
R/W SHEET NO.	I-4700B-43
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 95 OF 97

NAD 83



LEGEND

S S	DENOTES IMPACTS IN SURFACE WATER
TS TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50' 0' 50' 100' 150'
GRAPHIC SCALE

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								342		
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*1 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*1 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									27	
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	Bank Stabilization at the outlet of Proposed 54" RCP Extension								12	11	
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	0.03						
11	WBV	EBL 938+81 to 952+45 LT	RipRap Outlet Protection of Proposed 24" CSP and Existing 66" RCP	0.15		< 0.01	0.37						
12	UT to French Broad River / SFX / WBU	WBL 942+31 to 943+22 RT	30" RCP Extension Due to Roadway Widening			0.01	0.02				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	< 0.01				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*1 at downstream of 66" CSP Extension								22	7	
15	Powell Creek / SDN	WBL 983+40 to 983+73 RT	Bank Stabilization at inlet of Proposed 2@ 10' X 10' RCBC								42	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+07 LT	Bank Stabilization at outlet of Proposed 2@ 10' X 10' RCBC								82	13	
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 at inlet of 2 @ 48" RCP								10	10	
18	UT to French Broad River / SDU	L 1026+47 to 1026+68 LT	Channel Change*1 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*1 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			0.06						
20	UT to French Broad River / SDV	L 1042+57 to 1042+72 RT	Bank Stabilization at outlet of proposed 42" RCP 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*1 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	0.01						
TOTALS*:				0.26		0.07	0.50				1564	173	

*Rounded totals are sum of actual impacts

NOTES:
*1: Emedding Riprap

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
12/3/2018
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*1 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*1 at Outlet of Proposed 48" RCP								24	10	
24A	UT to French Broad River / SDX	EBL 1097+18 to 1097+46 median	Channel Change*1 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	Existing 30" CMP with 30" RCP Extension			< 0.01					19	13	
28	UT to French Broad River / SDY	WBL 1104+88 to 1105+14 LT	Channel Change*1 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*1 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*1 at Outlet of 24" CSP and Conc. Energy Dissipator								9	20	
30	UT to French Broad River / SDX	EBL 1118+02 to 1118+30 RT	Channel Change*1 at Outlet of Proposed 15" CSP and Conc. Energy Dissipator								9	20	
30	UT to French Broad River / SDX	WBL 1118+34 to 1118+65 LT	Channel Change*1 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			0.30						
32	UT to French Broad River / SEQ	WBL 1131+60 to 1131+94 RT	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	
33	UT to French Broad River / SEQ	EBL 1131+00 to 1131+12 LT	Proposed 60" WSP with 60" RCP Extension								30		
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								30	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*1 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*1 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								356	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*1 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 Acess Road									662	
41	UT to French Broad River / SFG	L 1172+85 to 1173+15 RT	Channel Change*1 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 Acess Road									9	
43	WDZ	L 1179+54 to 1180+29 RT	Fill in Wetland Due to Roadway Widening	0.02			0.02						
44	UT to French Broad River / SFG	L 1196+69 to 1196+95 RT	Channel Change*1 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								29		
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	0.32				1392	1428	
TOTALS FOR I-4700:				0.67		0.07	0.82				2956	1601	

*Rounded totals are sum of actual impacts

NOTES:
Site 40: Impacts of interior bents are 400 SF
*1: Emedding Riprap

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
12/3/2018
Buncombe & Henderson County
I-4700

7/24/2017

TIP PROJECT: I–4700

CONTRACT: C204266

28-NOV-2018 09:20
I4700A_RDY_TSH
HNTB

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BUNCOMBE & HENDERSON COUNTIES

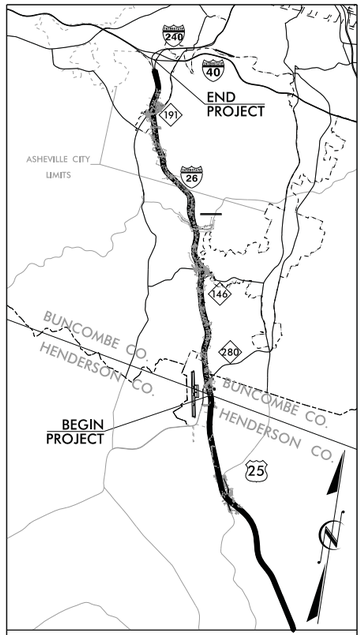
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I–4700	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
WBS 36030.1.FS4	IMNHF–026–1(86)9	I–4700A(P.E.)
WBS 36030.1.FS3	IMNHF–026–1(86)9	I–4700B(P.E.)
WBS 36030.1.5	TBD	I–4700A(UTIL)
WBS 36030.1.6	TBD	I–4700B(UTIL)
WBS 36030.2.3	TBD	I–4700A(R/W)
WBS 36030.2.4	TBD	I–4700B(R/W)
WBS 36030.3.4	NHPP–026–1(199)6	I–4700(CONST)

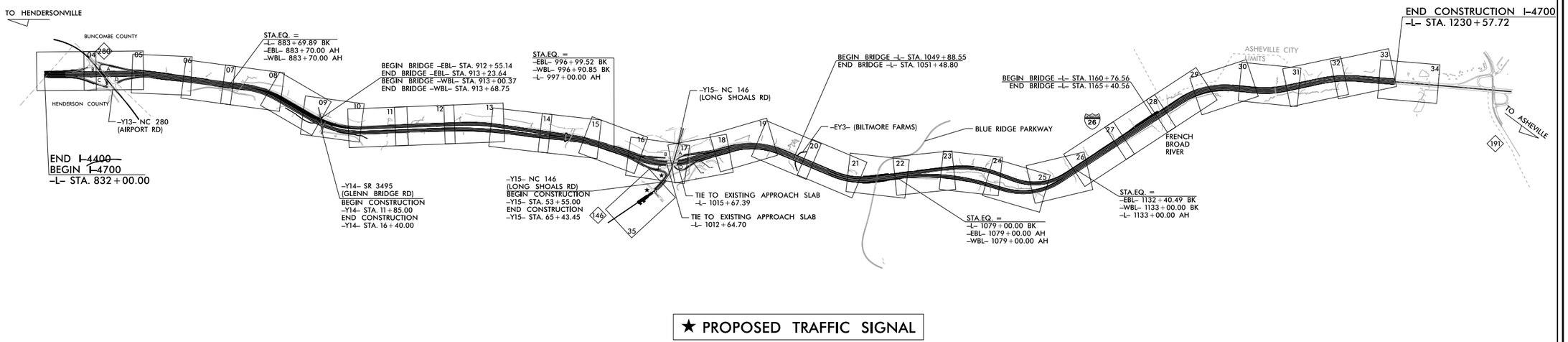
100% PLANS

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, DRAINAGE, PAVING, STRUCTURES, AND SIGNALS



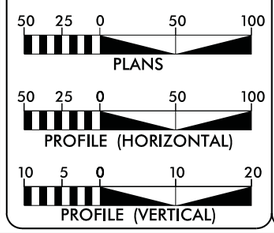
VICINITY MAP



★ PROPOSED TRAFFIC SIGNAL

NOTE:
1. THIS IS A CONTROLLED– ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.

GRAPHIC SCALES



DESIGN DATA

ADT 2019 = 84,662
ADT 2040 = 117,900
K = 10
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–4700 = 7.358 MI

TOTAL LENGTH OF STRUCTURES OF TIP PROJECT

I–4700 = 0.131 MI

TOTAL LENGTH OF TIP PROJECT

I–4700 = 7.489 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:
MAY 21, 2019

JOSEPH OLSON, P.E.
PROJECT ENGINEER

JEFF HESS, P.E.
PROJECT DESIGN ENGINEER

WANDA AUSTIN, P.E.
NCDOT CONTACT

HYDRAULICS ENGINEER

P.E.
SIGNATURE:

ROADWAY DESIGN ENGINEER

P.E.
SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

PROJECT REFERENCE NO.	SHEET NO.
I-4700	4
R/W SHEET NO.	I-4700A-16
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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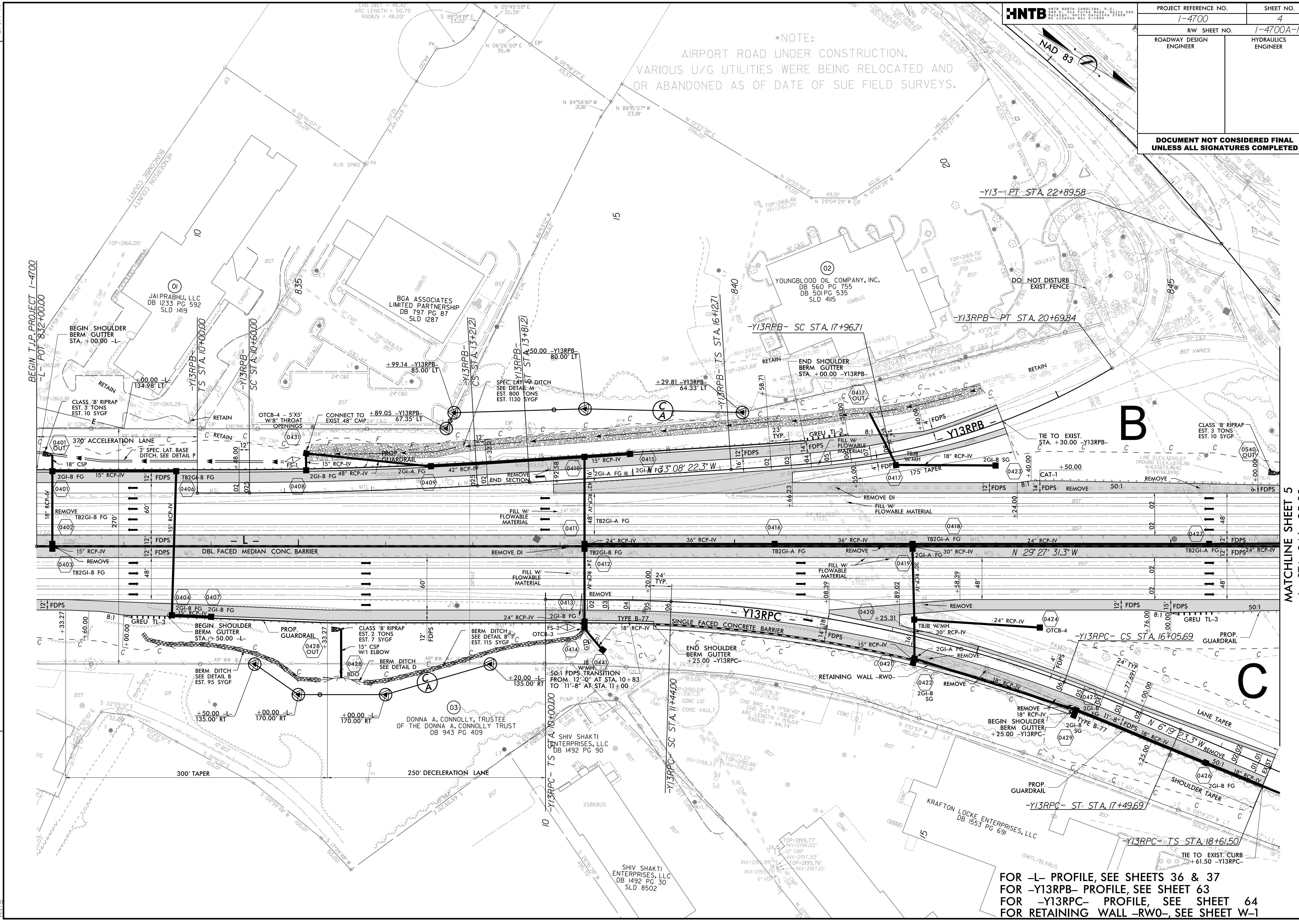

HNTB
NAD 83
*NOTE:
AIRPORT ROAD UNDER CONSTRUCTION.
VARIOUS U/G UTILITIES WERE BEING RELOCATED AND
OR ABANDONED AS OF DATE OF SUE FIELD SURVEYS.
BUNCOMBE COUNTY
HENDERSON COUNTY
JAI PRABHU, LLC
DB 1233 PG 592
SLD 1419
BGA ASSOCIATES
LIMITED PARTNERSHIP
DB 797 PG 87
SLD 1287
YOUNGBLOOD OIL COMPANY, INC.
DB 560 PG 755
DB 501 PG 535
SLD 4115
DONNA A. CONNOLLY, TRUSTEE
OF THE DONNA A. CONNOLLY TRUST
DB 943 PG 409
SHIV SHAKTI
ENTERPRISES, LLC
DB 1492 PG 90
SHIV SHAKTI
ENTERPRISES, LLC
DB 1492 PG 30
SLD 8502
KRAFTON LOCKE ENTERPRISES, LLC
DB 1553 PG 691
BEGIN T.I.P. PROJECT I-4700
-L- POT 832+00.00
-Y13- PT STA. 22+89.58
-Y13RPB- PT STA. 20+69.84
-Y13RPB- SC STA. 17+96.71
-Y13RPB- TS STA. 16+12.71
-Y13RPC- CS STA. 16+05.69
-Y13RPC- ST STA. 17+49.69
-Y13RPC- TS STA. 18+61.50
-Y13RPC- SC STA. 11+44.00
-Y13RPC- TS STA. 10+00.00
DO NOT DISTURB EXIST. FENCE
370' ACCELERATION LANE
300' TAPER
250' DECELERATION LANE
DBL. FACED MEDIAN CONC. BARRIER
SINGLE FACED CONCRETE BARRIER
RETAINING WALL -RW0-
N 29° 27' 31.3" W
N 33° 08' 22.3" W
N 6° 19' 23.3" W
Y13RPB
Y13RPC
B
C
MATCHLINE SHEET 5
-L- STA 846+25.00

FOR -L- PROFILE, SEE SHEETS 36 & 37
FOR -Y13RPB- PROFILE, SEE SHEET 63
FOR -Y13RPC- PROFILE, SEE SHEET 64
FOR RETAINING WALL -RW0-, SEE SHEET W-1

REVISIONS

8/17/99

03-DEC-2018 16:32
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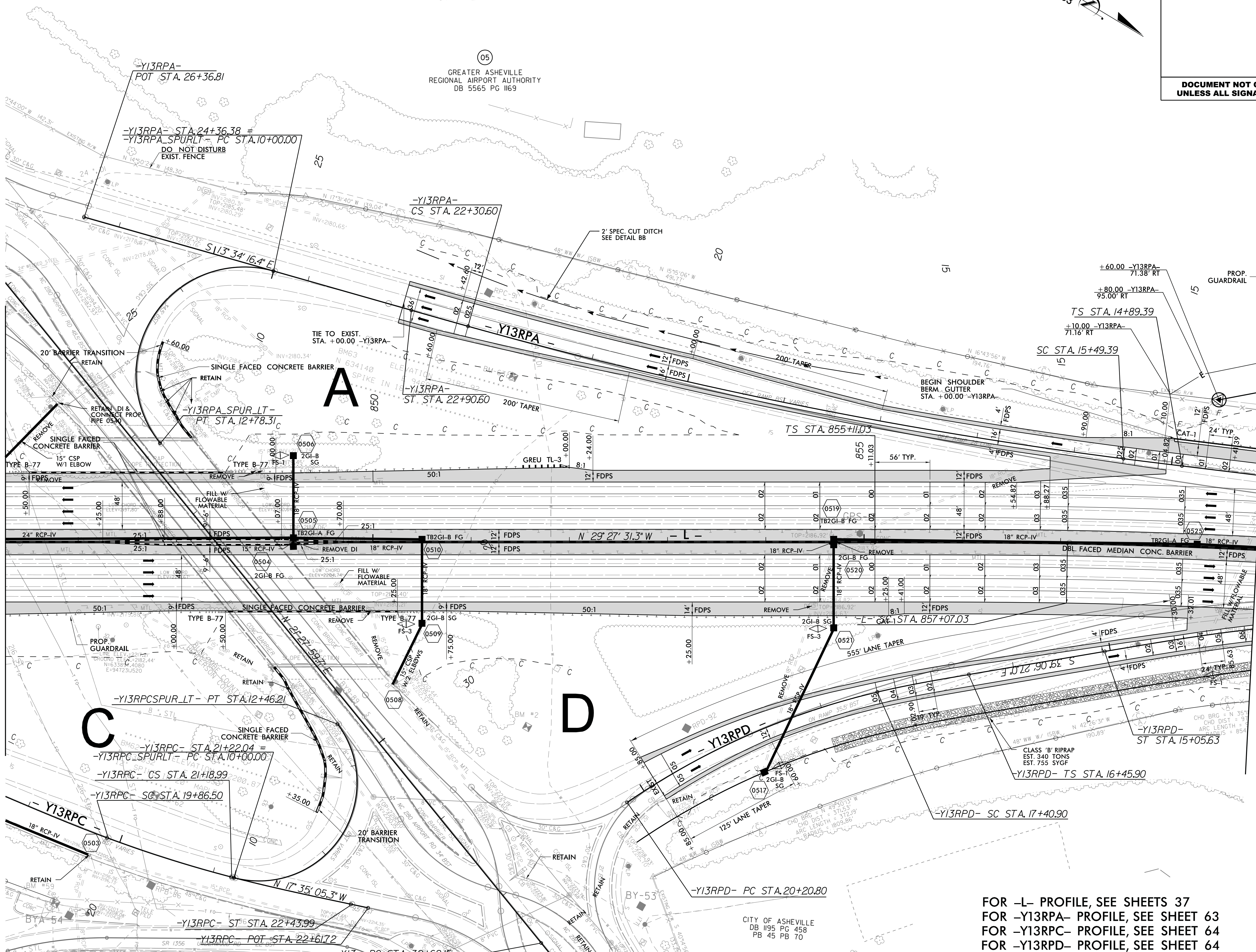
*NOTE:
AIRPORT ROAD UNDER CONSTRUCTION.
VARIOUS U/G UTILITIES WERE BEING RELOCATED AND
OR ABANDONED AS OF DATE OF SUE FIELD SURVEYS.



NAD 83
GREATER ASHEVILLE REGIONAL AIRPORT AUTHORITY DB 5565 PG 1169
-Y13RPA- POT STA. 26+36.81
-Y13RPA- STA. 24+36.38 = -Y13RPA_SPURLT- PC STA.10+00.00
DO NOT DISTURB EXIST. FENCE
-Y13RPA- CS STA. 22+30.60
2' SPEC. CUT DITCH SEE DETAIL BB
S 13° 34' 16.4" E
TIE TO EXIST. STA. +00.00 -Y13RPA-
20' BARRIER TRANSITION
SINGLE FACED CONCRETE BARRIER
RETAIN
-Y13RPA_SPUR_LT- PT STA. 12+78.31
-Y13RPA- ST STA. 22+90.60
200' TAPER
A
BEGIN SHOULDER BERM GUTTER STA. +00.00 -Y13RPA-
TS STA. 855+11.03
+60.00 -Y13RPA- 71.38' RT
+80.00 -Y13RPA- 95.00' RT
TS STA. 14+89.39
+10.00 -Y13RPA- 71.16' RT
SC STA. 15+49.39
PROP. GUARDRAIL
MATCHLINE SHEET 4 -L- STA. 846+25.00
MATCHLINE SHEET 6 -L- STA. 859+00.00
N 29° 27' 31.3" W -L-
DBL. FACED MEDIAN CONC. BARRIER
FILL W/ FLOWABLE MATERIAL
SINGLE FACED CONCRETE BARRIER
-L- SC STA. 857+07.03
555' LANE TAPER
PROP. GUARDRAIL
-Y13RPCSPUR_LT- PT STA. 12+46.21
C
D
-Y13RPC- STA. 21+22.04 = -Y13RPC_SPURLT- PC STA.10+00.00
-Y13RPC- CS STA. 21+18.99
-Y13RPC- SC STA. 19+86.50
20' BARRIER TRANSITION
N 17° 35' 05.3" W
-Y13RPC- ST STA. 22+43.99
-Y13RPC- POT STA. 22+61.72
-Y13- PC STA. 32+62.15
- Y13RPD -
125' LANE TAPER
CLASS 'B' RIPRAP EST. 340 TONS EST. 755 SYGF
-Y13RPD- ST STA. 15+05.63
-Y13RPD- TS STA. 16+45.90
-Y13RPD- SC STA. 17+40.90
-Y13RPD- PC STA. 20+20.80
CITY OF ASHEVILLE DB 1195 PG 458 PB 45 PB 70

FOR -L- PROFILE, SEE SHEETS 37
FOR -Y13RPA- PROFILE, SEE SHEET 63
FOR -Y13RPC- PROFILE, SEE SHEET 64
FOR -Y13RPD- PROFILE, SEE SHEET 64

REVISIONS

8/17/99

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

PROJECT REFERENCE NO.	SHEET NO.
I-4700	6
R/W SHEET NO.	I-4700A - 17
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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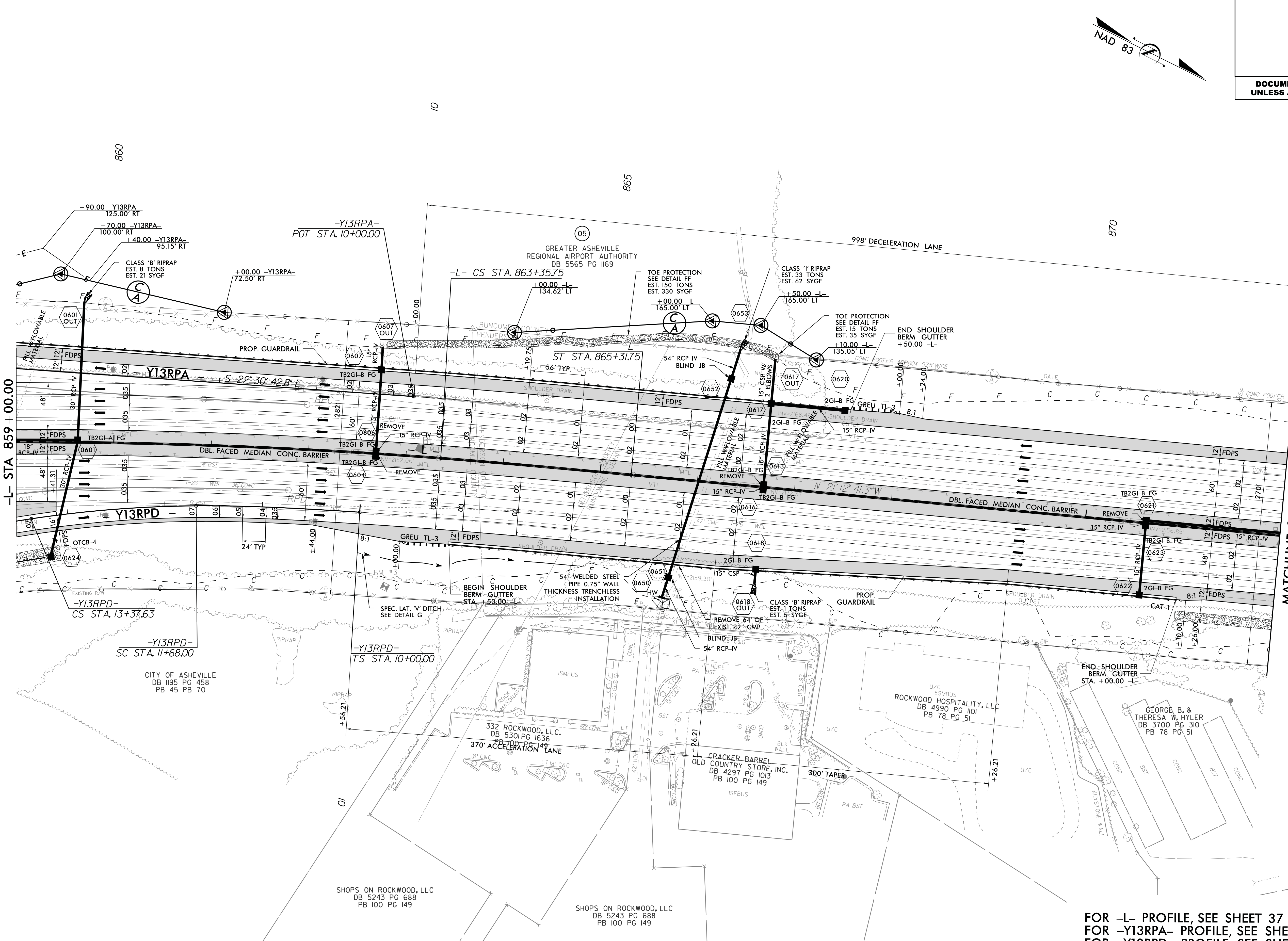
REVISIONS

7/19/2017



NAD 83
MATCHLINE SHEET 5
-L- STA 859+00.00
MATCHLINE SHEET 7
-L- STA 872+00.00
-Y13RPA-
POT STA. 10+00.00
-L- CS STA. 863+35.75
ST STA. 865+31.75
998' DECELERATION LANE
GREATER ASHEVILLE
REGIONAL AIRPORT AUTHORITY
DB 5565 PG 1169
Y13RPA
S 22°30' 42.8" E
Y13RPD
N 21°12' 41.3" W
DBL. FACED MEDIAN CONC. BARRIER
PROP. GUARDRAIL
CLASS 'B' RIPRAP
EST. 8 TONS
EST. 21 SYGF
CLASS 'I' RIPRAP
EST. 33 TONS
EST. 62 SYGF
TOE PROTECTION
SEE DETAIL FF
EST. 150 TONS
EST. 330 SYGF
TOE PROTECTION
SEE DETAIL FF
EST. 15 TONS
EST. 35 SYGF
END SHOULDER
BERM GUTTER
+50.00 -L-
BEGIN SHOULDER
BERM GUTTER
STA. +50.00 -L-
END SHOULDER
BERM GUTTER
STA. +00.00 -L-
54" WELDED STEEL
PIPE 0.75" WALL
THICKNESS TRENCHLESS
INSTALLATION
REMOVE 64' OF
EXIST. 42" CMP
CLASS 'B' RIPRAP
EST. 1 TONS
EST. 5 SYGF
SPEC. LAT. 'V' DITCH
SEE DETAIL G
-Y13RPD-
CS STA. 13+37.63
-Y13RPD-
SC STA. 11+68.00
-Y13RPD-
TS STA. 10+00.00
CITY OF ASHEVILLE
DB 1195 PG 458
PB 45 PB 70
332 ROCKWOOD, LLC.
DB 5301 PG 1636
PB 100 PG 149
370' ACCELERATION LANE
CRACKER BARREL
OLD COUNTRY STORE, INC.
DB 4297 PG 1013
PB 100 PG 149
300' TAPER
ROCKWOOD HOSPITALITY, LLC
DB 4990 PG 1101
PB 78 PG 51
GEORGE B. &
THERESA W. HYLER
DB 3700 PG 310
PB 78 PG 51
SHOPS ON ROCKWOOD, LLC
DB 5243 PG 688
PB 100 PG 149
SHOPS ON ROCKWOOD, LLC
DB 5243 PG 688
PB 100 PG 149

FOR -L- PROFILE, SEE SHEET 37 & 38
FOR -Y13RPA- PROFILE, SEE SHEET 63
FOR -Y13RPD- PROFILE, SEE SHEET 64

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8/17/99

REVISIONS

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Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	7
R/W SHEET NO.	I-4700A - 18
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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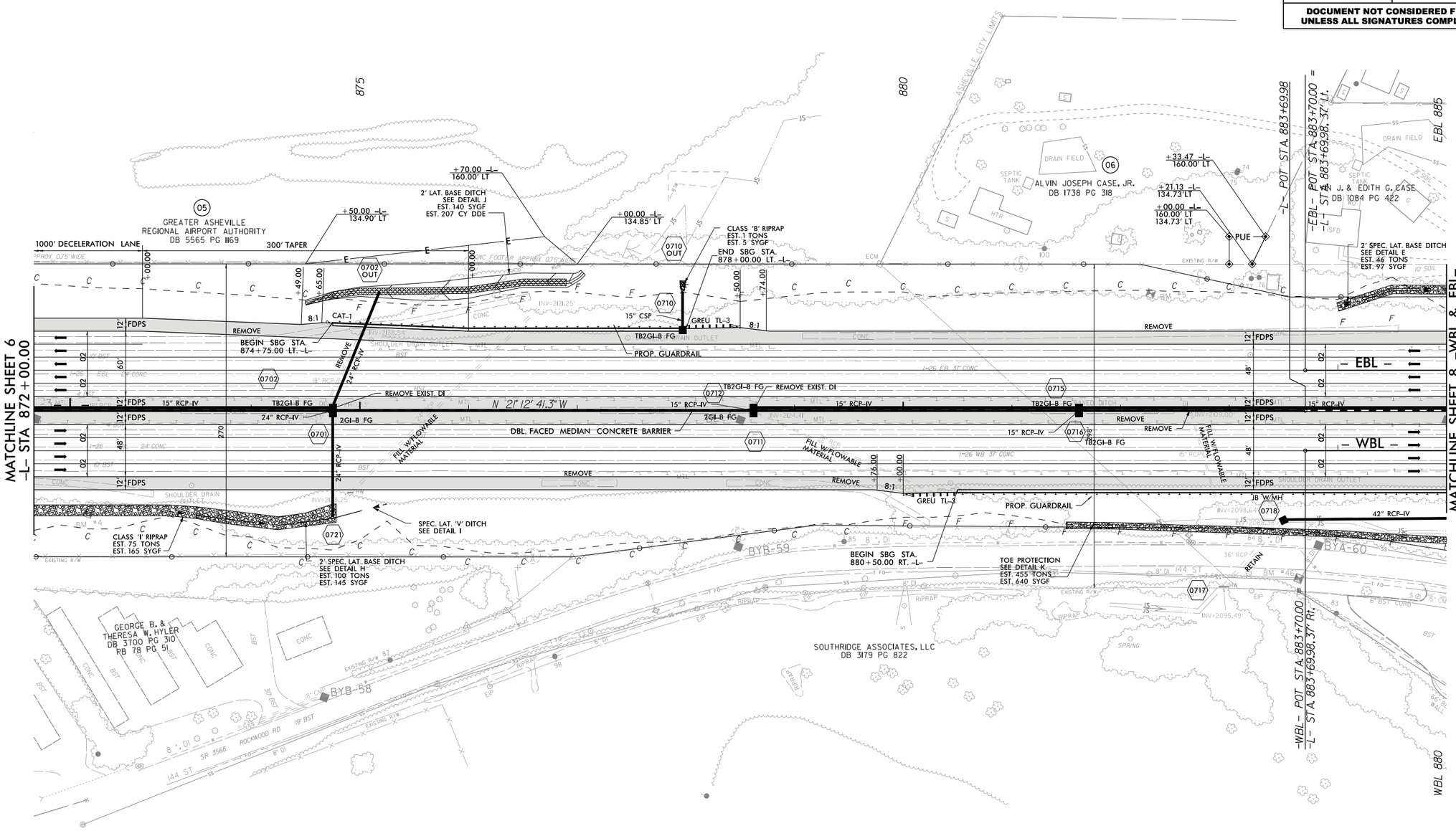
NAD 83



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

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PROJECT REFERENCE NO.	SHEET NO.
I-4700	8
R/W SHEET NO.	I-4700A - 19

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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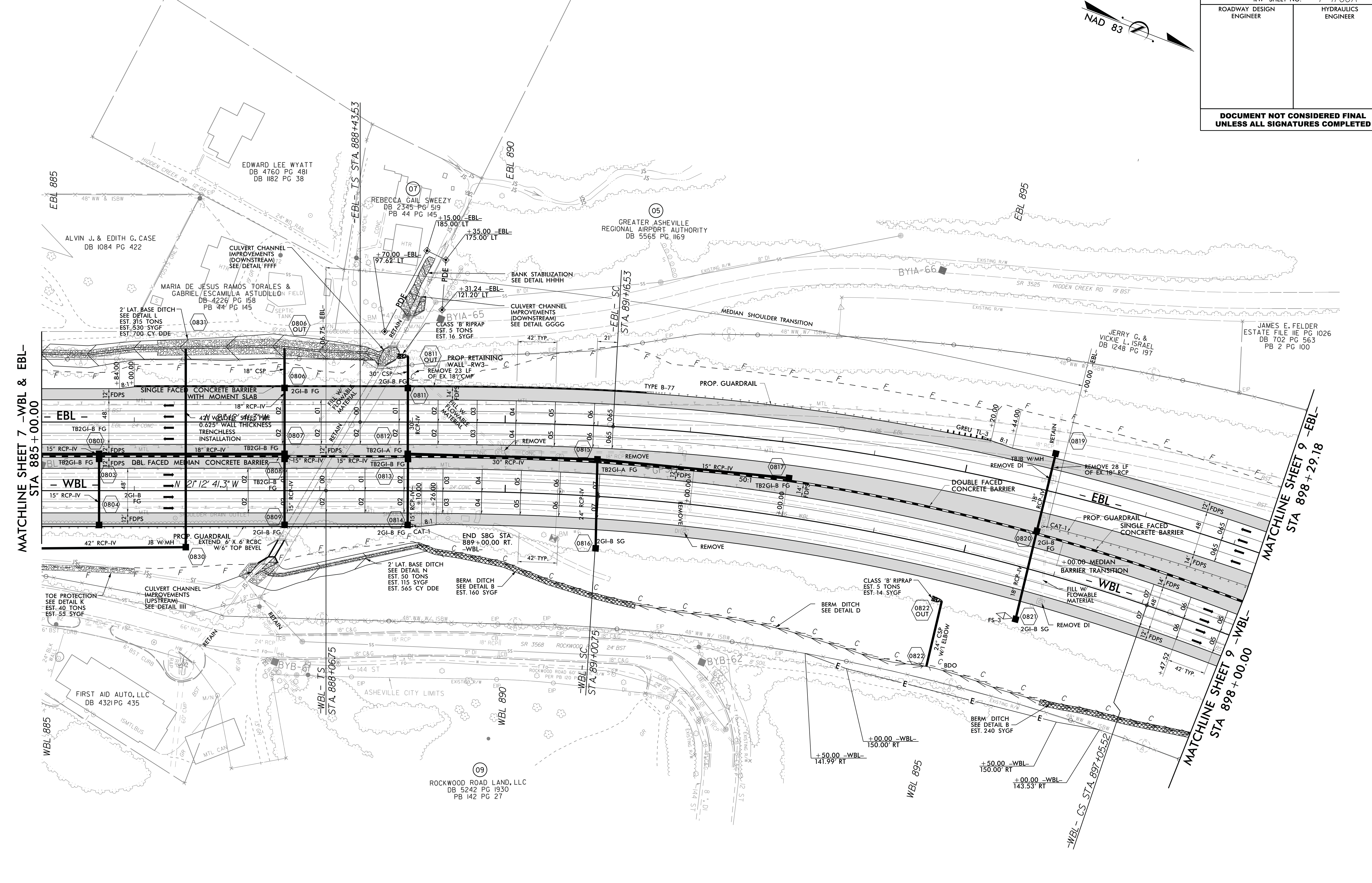

FOR - EBL - PROFILE, SEE SHEET 39 & 40
FOR - WBL - PROFILE, SEE SHEET 39 & 40
FOR RETAINING WALL -RW3-, SEE SHEET W-2

REVISIONS

8/17/99

03-DEC-2018 16:32
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PROJECT REFERENCE NO.	SHEET NO.
I-4700	9
R/W SHEET NO.	I-4700A-20

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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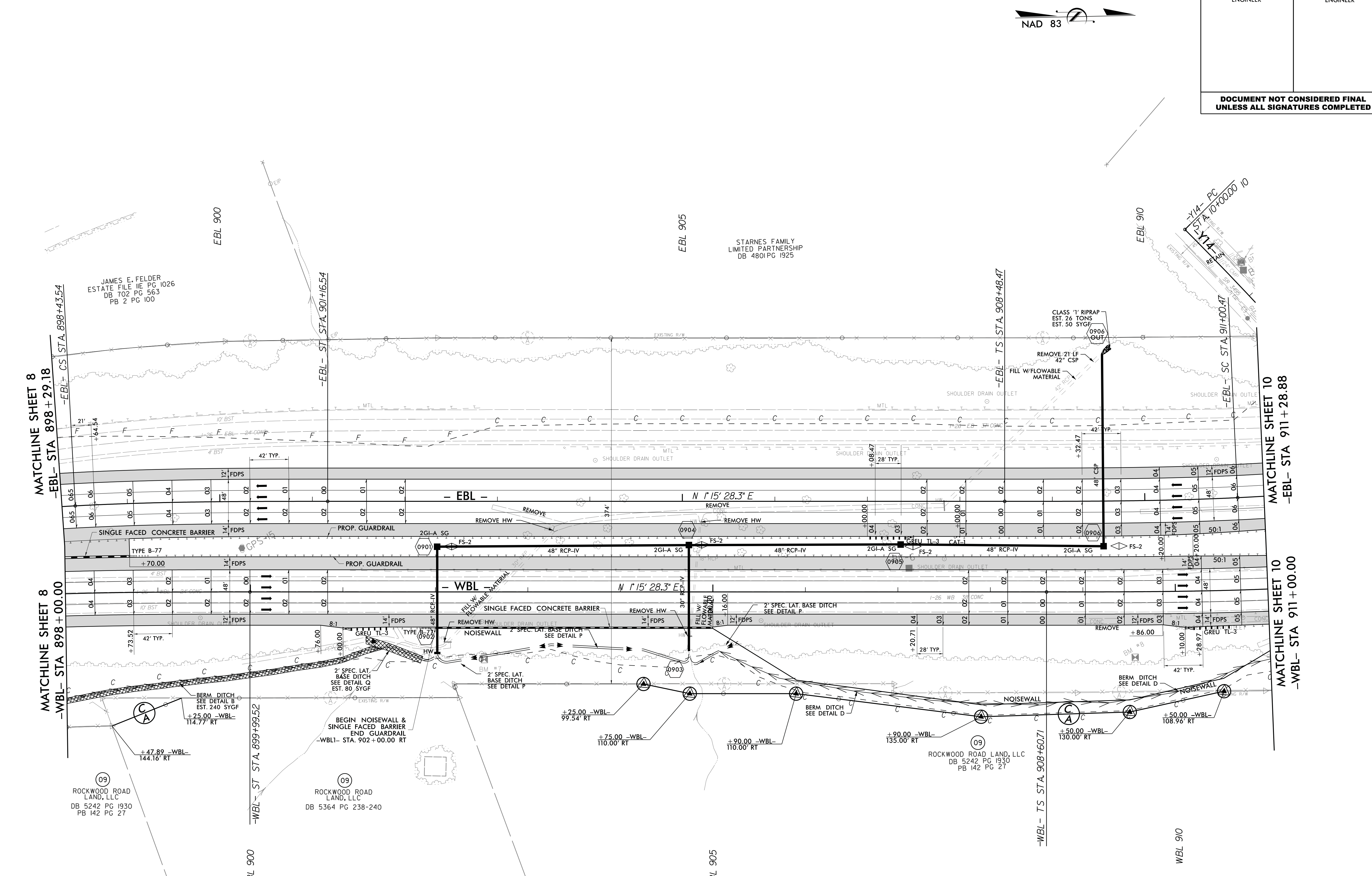
REVISIONS

8/17/99



NAD 83
JAMES E. FELDER
ESTATE FILE IIE PG 1026
DB 702 PG 563
PB 2 PG 100
STARNES FAMILY
LIMITED PARTNERSHIP
DB 4801 PG 1925
EBL 900
EBL 905
EBL 910
WBL 900
WBL 905
WBL 910
-Y14- PC
STA 10+00.00
MATCHLINE SHEET 8
-EBL- STA 898+29.18
MATCHLINE SHEET 8
-WBL- STA 898+00.00
MATCHLINE SHEET 10
-EBL- STA 911+28.88
MATCHLINE SHEET 10
-WBL- STA 911+00.00
-EBL- CS STA 898+43.54
-EBL- ST STA 901+16.54
-EBL- TS STA 908+48.47
-EBL- SC STA 911+00.47
-WBL- ST STA 899+99.52
-WBL- TS STA 908+60.71
- EBL -
- WBL -
N 1°15' 28.3" E
CLASS 'I' RIPRAP
EST. 26 TONS
EST. 50 SYGF
REMOVE 21 LF 42" CSP
FILL W/FLOWABLE MATERIAL
SHOULDER DRAIN OUTLET
SINGLE FACED CONCRETE BARRIER
PROP. GUARDRAIL
TYPE B-77
REMOVE HW
2GI-A SG
48" RCP-IV
30" RCP-IV
GREU TL-3
CAT-1
FS-2
FDPS
42' TYP.
28' TYP.
NOISEWALL
2' SPEC. LAT. BASE DITCH
SEE DETAIL P
2' SPEC. LAT. BASE DITCH
SEE DETAIL Q
EST. 80 SYGF
BERM DITCH
SEE DETAIL B
EST. 240 SYGF
BERM DITCH
SEE DETAIL D
BEGIN NOISEWALL &
SINGLE FACED BARRIER
END GUARDRAIL
-WBL1- STA. 902+00.00 RT
+25.00 -WBL-
114.77' RT
+47.89 -WBL-
144.16' RT
+25.00 -WBL-
99.54' RT
+75.00 -WBL-
110.00' RT
+90.00 -WBL-
110.00' RT
+90.00 -WBL-
135.00' RT
+50.00 -WBL-
130.00' RT
+50.00 -WBL-
108.96' RT
ROCKWOOD ROAD
LAND, LLC
DB 5242 PG 1930
PB 142 PG 27
ROCKWOOD ROAD
LAND, LLC
DB 5364 PG 238-240
ROCKWOOD ROAD LAND, LLC
DB 5242 PG 1930
PB 142 PG 27
EXISTING R/W

FOR – EBL – PROFILE, SEE SHEET 40 & 41
FOR – WBL – PROFILE, SEE SHEET 40 & 41

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PROJECT REFERENCE NO.	SHEET NO.
I-4700	10
R/W SHEET NO.	I-4700A - 21
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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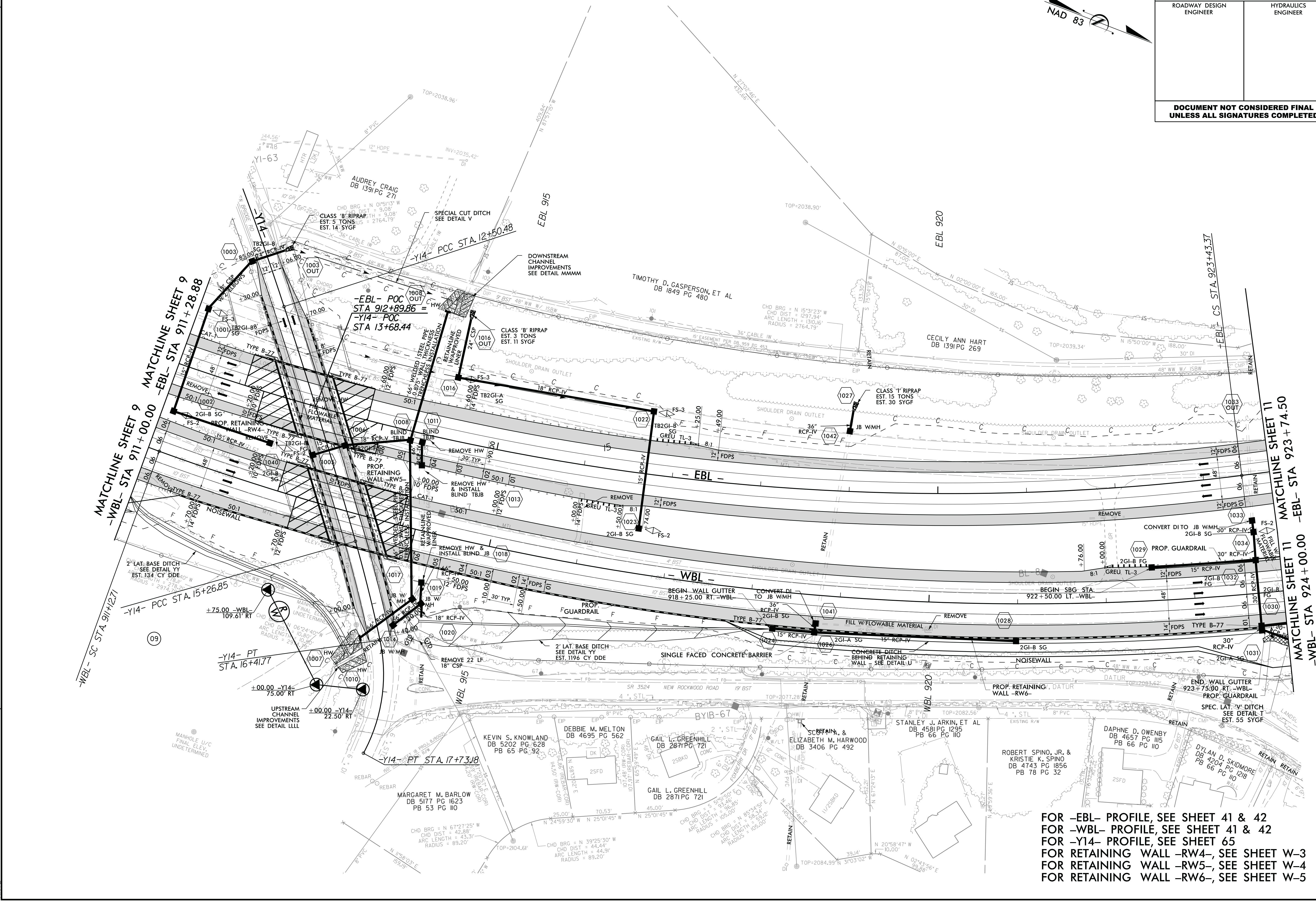

NAD 83
MATCHLINE SHEET 9 -EBL- STA 911+28.88
MATCHLINE SHEET 9 -WBL- STA 911+00.00
MATCHLINE SHEET 11 -EBL- STA 923+74.50
MATCHLINE SHEET 11 -WBL- STA 924+00.00
-EBL-
-WBL-
-Y14-
-Y14- PCC STA. 12+50.48
-EBL- POC STA 912+89.86 = -Y14- POC STA 13+68.44
-Y14- PCC STA. 15+26.85
-Y14- PT STA. 16+41.77
-Y14- PT STA. 17+73.18
-WBL- SC STA. 911+12.71
+EBL- CS STA. 923+43.37
AUDREY CRAIG DB 1391 PG 271
TIMOTHY D. GASPERSON, ET AL DB 1849 PG 480
CECILY ANN HART DB 1391 PG 269
KEVIN S. KNOWLAND DB 5202 PG 628 PB 65 PG 92
DEBBIE M. MELTON DB 4695 PG 562
GAIL L. GREENHILL DB 2871 PG 721
SCOTT A. & ELIZABETH M. HARWOOD DB 3406 PG 492
STANLEY J. ARKIN, ET AL DB 4581 PG 1295 PB 66 PG 110
ROBERT SPINO, JR. & KRISTIE K. SPINO DB 4743 PG 1856 PB 78 PG 32
DAPHNE D. OWENBY DB 4657 PG 1115 PB 66 PG 110
DYLAN D. SKIDMORE DB 4204 PG 1218 PB 66 PG 110
MARGARET M. BARLOW DB 5177 PG 1623 PB 53 PG 110
SR 3524 NEW ROCKWOOD ROAD
PROP. RETAINING WALL -RW4-
PROP. RETAINING WALL -RW5-
PROP. RETAINING WALL -RW6-
SINGLE FACED CONCRETE BARRIER
NOISEWALL
BEGIN WALL GUTTER 918+25.00 RT. -WBL-
END WALL GUTTER 923+75.00 RT. -WBL-
BEGIN SBG STA. 922+50.00 LT. -WBL-
DOWNSTREAM CHANNEL IMPROVEMENTS SEE DETAIL MMMM
UPSTREAM CHANNEL IMPROVEMENTS SEE DETAIL LLLL
SPECIAL CUT DITCH SEE DETAIL V

FOR -EBL- PROFILE, SEE SHEET 41 & 42
FOR -WBL- PROFILE, SEE SHEET 41 & 42
FOR -Y14- PROFILE, SEE SHEET 65
FOR RETAINING WALL -RW4-, SEE SHEET W-3
FOR RETAINING WALL -RW5-, SEE SHEET W-4
FOR RETAINING WALL -RW6-, SEE SHEET W-5

REVISIONS

8/17/99

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PROJECT REFERENCE NO.	SHEET NO.
I-4700	11
R/W SHEET NO.	I-4700A-22
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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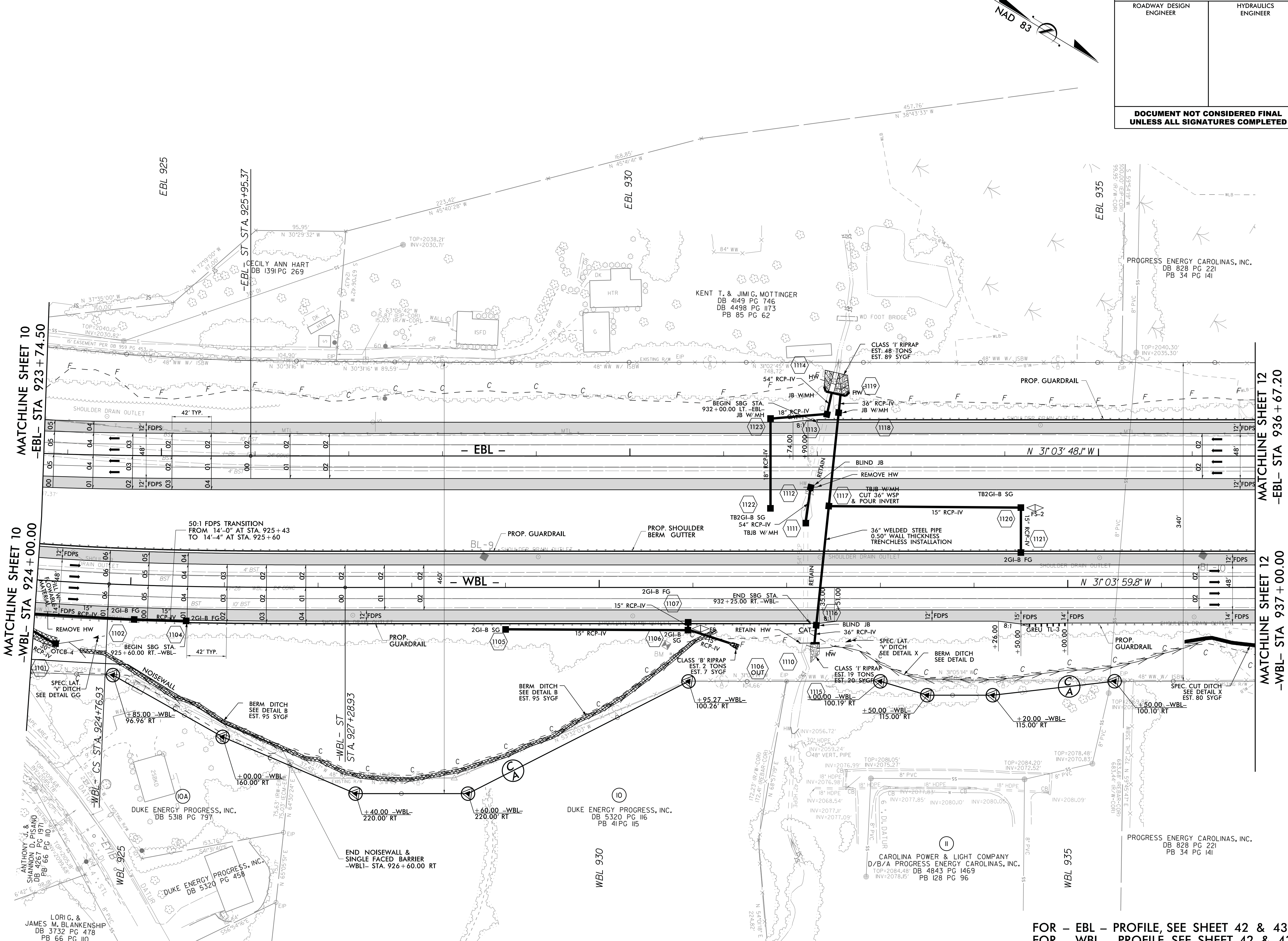
REVISIONS



NAD 83
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
EBL 925
EBL 930
EBL 935
WBL 925
WBL 930
WBL 935
- EBL -
- WBL -
N 31° 03' 48.1" W
N 31° 03' 59.8" W
-EBL- ST STA. 925+95.37
-WBL- ST STA. 927+28.93
-WBL- CS STA. 924+76.93
CECILY ANN HART
DB 1391 PG 269
KENT T. & JIMI G. MOTTINGER
DB 4149 PG 746
DB 4498 PG 1173
PB 85 PG 62
PROGRESS ENERGY CAROLINAS, INC.
DB 828 PG 221
PB 34 PG 141
DUKE ENERGY PROGRESS, INC.
DB 5318 PG 797
DUKE ENERGY PROGRESS, INC.
DB 5320 PG 116
PB 41 PG 115
DUKE ENERGY PROGRESS, INC.
DB 5320 PG 458
CAROLINA POWER & LIGHT COMPANY
D/B/A PROGRESS ENERGY CAROLINAS, INC.
DB 4843 PG 1469
PB 128 PG 96
ANTHONY J. & SHANNON D. PISANO
DB 4267 PG 1971
PB 66 PG 110
LORI G. & JAMES M. BLANKENSHIP
DB 3732 PG 478
PB 66 PG 110
PROP. GUARDRAIL
PROP. SHOULDER BERM GUTTER
50:1 FDPS TRANSITION FROM 14'-0" AT STA. 925+43 TO 14'-4" AT STA. 925+60
BEGIN SBG STA. 932+00.00 LT. -EBL-
END SBG STA. 932+25.00 RT. -WBL-
BEGIN SBG STA. 925+60.00 RT. -WBL-
CLASS 'I' RIPRAP EST. 48 TONS EST. 89 SYGF
CLASS 'B' RIPRAP EST. 2 TONS EST. 7 SYGF
CLASS 'I' RIPRAP EST. 19 TONS EST. 20 SYGF
36" WELDED STEEL PIPE 0.50" WALL THICKNESS TRENCHLESS INSTALLATION
TBJB W/MH CUT 36" WSP & POUR INVERT
BLIND JB
REMOVE HW
RETAIN HW
REMOVE HW
BERM DITCH SEE DETAIL B EST. 95 SYGF
BERM DITCH SEE DETAIL D
SPEC. LAT. 'V' DITCH SEE DETAIL X
SPEC. LAT. 'V' DITCH SEE DETAIL GG
SPEC. CUT DITCH SEE DETAIL X EST. 80 SYGF
END NOISEWALL & SINGLE FACED BARRIER -WBL1- STA. 926+60.00 RT
NOISEWALL
+85.00 -WBL- 96.96' RT
+00.00 -WBL- 160.00' RT
+40.00 -WBL- 220.00' RT
+60.00 -WBL- 220.00' RT
+95.27 -WBL- 100.26' RT
+00.00 -WBL- 100.19' RT
+50.00 -WBL- 115.00' RT
+20.00 -WBL- 115.00' RT
+50.00 -WBL- 100.10' RT
GREU TL-3

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

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REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
I-4700	12
R/W SHEET NO.	I-4700A-23

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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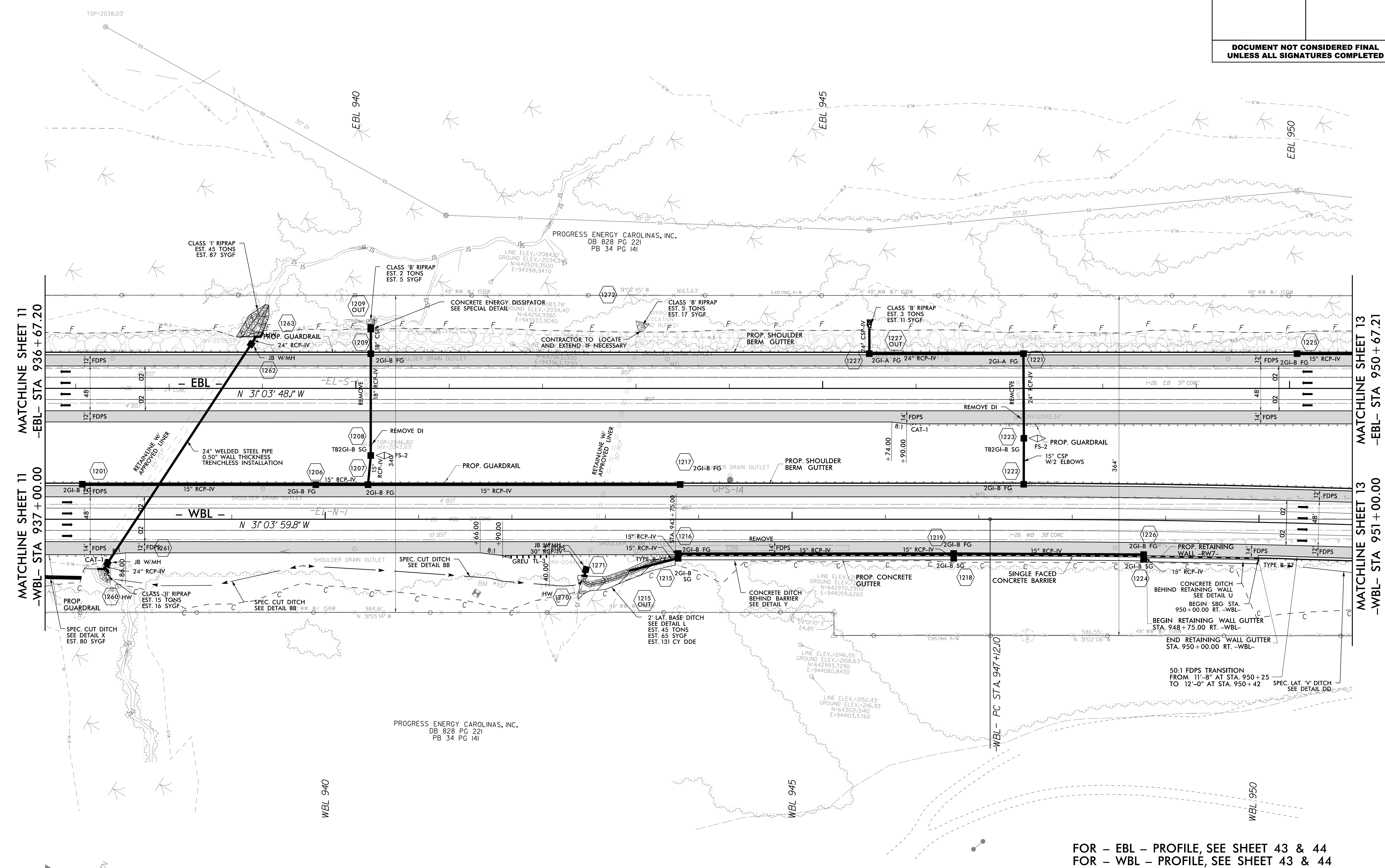

NAD 83
EBL 940
EBL 945
EBL 950
WBL 940
WBL 945
WBL 950
PROGRESS ENERGY CAROLINAS, INC.
DB 828 PG 221
PB 34 PG 141
MATCHLINE SHEET 11
-EBL- STA 936+67.20
MATCHLINE SHEET 11
-WBL- STA 937+00.00
MATCHLINE SHEET 13
-EBL- STA 950+67.21
MATCHLINE SHEET 13
-WBL- STA 951+00.00
- EBL -
N 31° 03' 48.1" W
- WBL -
N 31° 03' 59.8" W
CLASS 'I' RIPRAP
EST. 45 TONS
EST. 87 SYGF
CLASS 'B' RIPRAP
EST. 2 TONS
EST. 5 SYGF
CONCRETE ENERGY DISSIPATOR
SEE SPECIAL DETAIL
CLASS 'B' RIPRAP
EST. 5 TONS
EST. 17 SYGF
CLASS 'B' RIPRAP
EST. 3 TONS
EST. 11 SYGF
CONTRACTOR TO LOCATE
AND EXTEND IF NECESSARY
PROP. SHOULDER
BERM GUTTER
PROP. GUARDRAIL
24" RCP-IV
JB W/MH
REMOVE DI
24" WELDED STEEL PIPE
0.50" WALL THICKNESS
TRENCHLESS INSTALLATION
RETAINLINE W/
APPROVED LINER
15" CSP
W/2 ELBOWS
SPEC. CUT DITCH
SEE DETAIL BB
SPEC. CUT DITCH
SEE DETAIL X
EST. 80 SYGF
CLASS 'II' RIPRAP
EST. 15 TONS
EST. 16 SYGF
2' LAT. BASE DITCH
SEE DETAIL L
EST. 45 TONS
EST. 65 SYGF
EST. 131 CY DDE
CONCRETE DITCH
BEHIND BARRIER
SEE DETAIL Y
PROP. CONCRETE
GUTTER
SINGLE FACED
CONCRETE BARRIER
PROP. RETAINING
WALL -RW7-
CONCRETE DITCH
BEHIND RETAINING WALL
SEE DETAIL U
BEGIN SBG STA.
950+00.00 RT. -WBL-
BEGIN RETAINING WALL GUTTER
STA. 948+75.00 RT. -WBL-
END RETAINING WALL GUTTER
STA. 950+00.00 RT. -WBL-
50:1 FDPS TRANSITION
FROM 11'-8" AT STA. 950+25
TO 12'-0" AT STA. 950+42
SPEC. LAT. 'V' DITCH
SEE DETAIL DD
-WBL- PC STA 947+12.10
STA 943+75.00
GPS-14

FOR - EBL - PROFILE, SEE SHEET 43 & 44
FOR - WBL - PROFILE, SEE SHEET 43 & 44
FOR RETAINING WALL -RW7-, SEE SHEET W-6

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PROJECT REFERENCE NO.	SHEET NO.
I-4700	13
R/W SHEET NO.	I-4700A-24
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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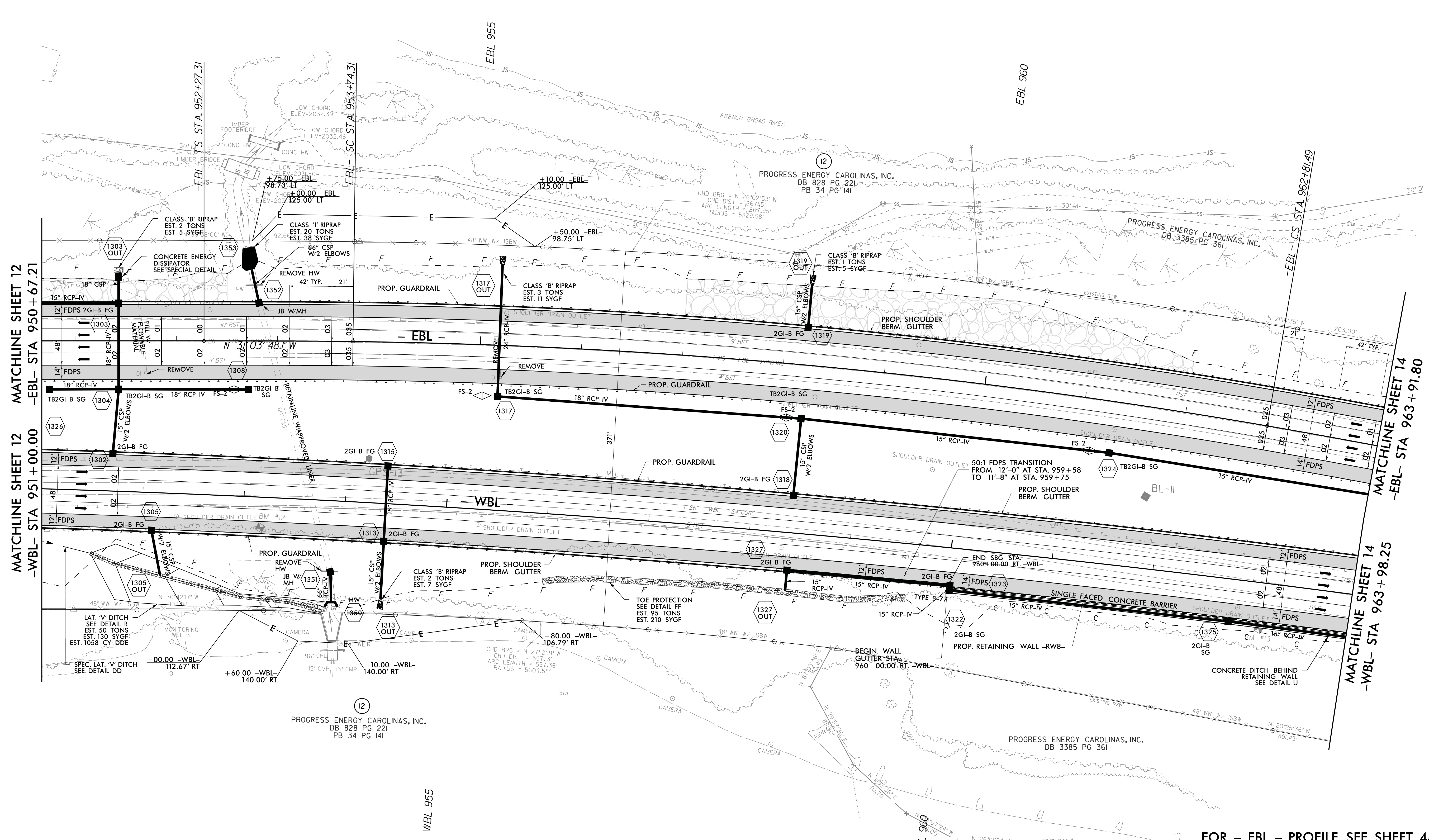
REVISIONS

8/17/99



NAD 83
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
-EBL- TS STA 952+27.31
-EBL- SC STA 953+74.31
-EBL- CS STA 962+81.49
EBL 955
EBL 960
WBL 955
WBL 960
- EBL -
- WBL -
FRENCH BROAD RIVER
PROGRESS ENERGY CAROLINAS, INC.
DB 828 PG 221
PB 34 PG 141
PROGRESS ENERGY CAROLINAS, INC.
DB 3385 PG 361
N 31°03'48" W
CLASS 'B' RIPRAP
EST. 2 TONS
EST. 5 SYGF
CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL
CLASS 'I' RIPRAP
EST. 20 TONS
EST. 38 SYGF
66" CSP W/2 ELBOWS
REMOVE HW
JB W/MH
+75.00 -EBL- 98.73' LT
+00.00 -EBL- 125.00' LT
+10.00 -EBL- 125.00' LT
+50.00 -EBL- 98.75' LT
PROP. GUARDRAIL
CLASS 'B' RIPRAP
EST. 3 TONS
EST. 11 SYGF
CLASS 'B' RIPRAP
EST. 1 TONS
EST. 5 SYGF
PROP. SHOULDER BERM GUTTER
RETAINING WALL W/APPROVED LINER
REMOVE
18" RCP-IV
15" RCP-IV
24" RCP-IV
15" CSP W/2 ELBOWS
TB2GI-B SG
2GI-B FG
FDPS
50:1 FDPS TRANSITION FROM 12'-0" AT STA. 959+58 TO 11'-8" AT STA. 959+75
BL-II
END SBG STA. 960+00.00 RT. -WBL-
SINGLE FACED CONCRETE BARRIER
TYPE B-77
TOE PROTECTION SEE DETAIL FF EST. 95 TONS EST. 210 SYGF
BEGIN WALL GUTTER STA. 960+00.00 RT. -WBL-
PROP. RETAINING WALL -RW8-
CONCRETE DITCH BEHIND RETAINING WALL SEE DETAIL U
LAT. 'V' DITCH SEE DETAIL R EST. 50 TONS EST. 130 SYGF EST. 1058 CY DDE
SPEC. LAT. 'V' DITCH SEE DETAIL DD
+00.00 -WBL- 112.67' RT
+60.00 -WBL- 140.00' RT
+10.00 -WBL- 140.00' RT
+80.00 -WBL- 106.79' RT
CLASS 'B' RIPRAP EST. 2 TONS EST. 7 SYGF

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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PROJECT REFERENCE NO.	SHEET NO.
I-4700	14
R/W SHEET NO.	I-4700A-25
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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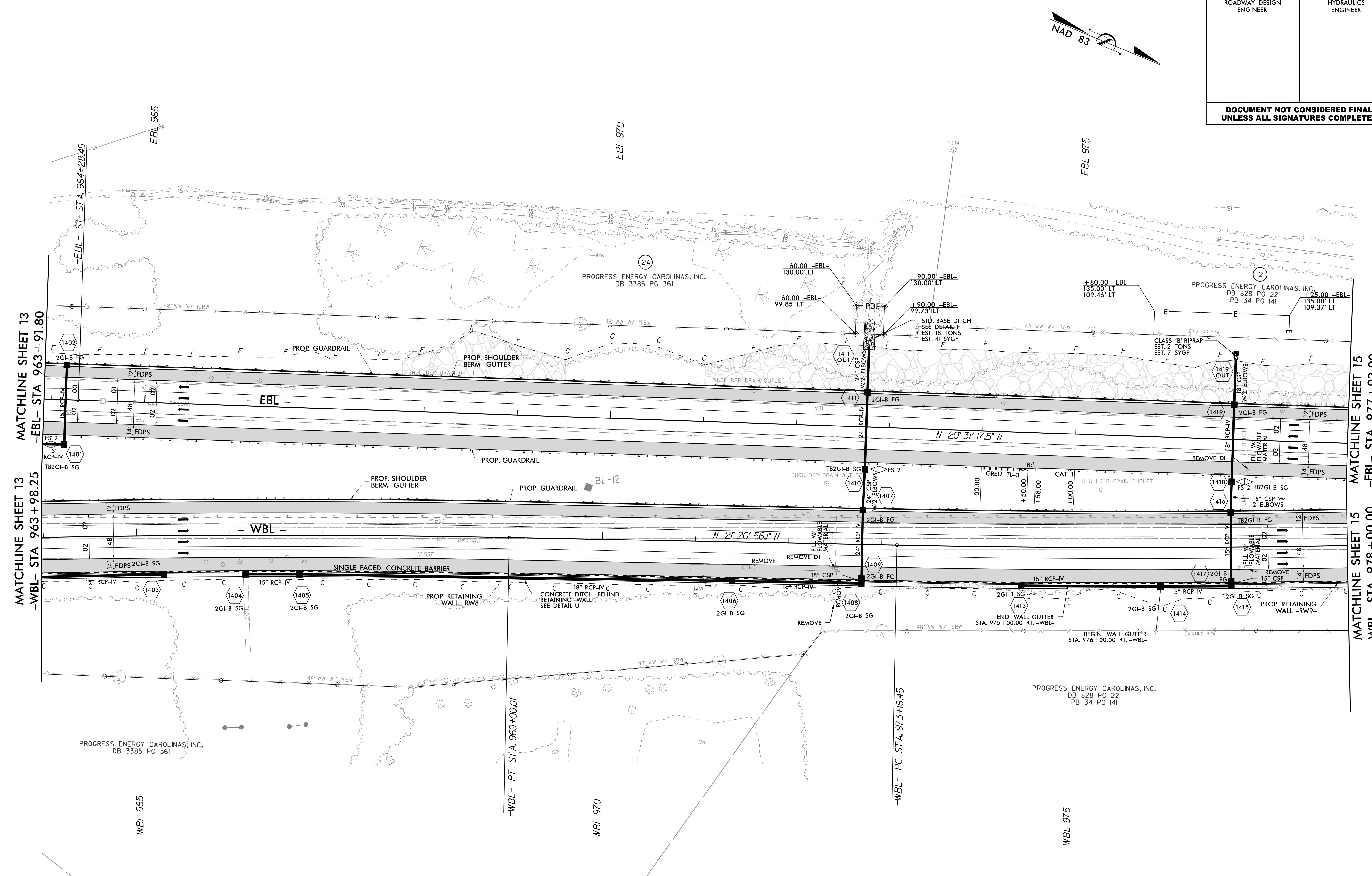

NAD 83
EBL 965
EBL 970
EBL 975
-EBL- ST. STA. 964+28.49
PROGRESS ENERGY CAROLINAS, INC.
DB 3385 PG 361
PROGRESS ENERGY CAROLINAS, INC.
DB 828 PG 221
PB 34 PG 141
MATCHLINE SHEET 13
-EBL- STA 963+91.80
MATCHLINE SHEET 13
-WBL- STA 963+98.25
MATCHLINE SHEET 15
-EBL- STA 977+92.00
MATCHLINE SHEET 15
-WBL- STA 978+00.00
- EBL -
- WBL -
N 20° 31' 17.5" W
N 21° 20' 56.1" W
PROP. GUARDRAIL
PROP. SHOULDER BERM GUTTER
SINGLE FACED CONCRETE BARRIER
PROP. RETAINING WALL -RW8-
CONCRETE DITCH BEHIND RETAINING WALL SEE DETAIL U
PROP. RETAINING WALL -RW9-
STD. BASE DITCH SEE DETAIL F EST. 18 TONS EST. 41 SYGF
CLASS 'B' RIPRAP EST. 2 TONS EST. 7 SYGF
+60.00 -EBL- 130.00' LT
+60.00 -EBL- 99.85' LT
+90.00 -EBL- 130.00' LT
+90.00 -EBL- 99.73' LT
+80.00 -EBL- 135.00' LT 109.46' LT
+25.00 -EBL- 135.00' LT 109.37' LT
PDE
FDPS
2GI-B FG
TB2GI-B SG
2GI-B SG
TB2GI-B FG
15" RCP-IV
18" RCP-IV
24" RCP-IV
18" CSP
15" CSP
24" CSP W/2 ELBOWS
18" CSP W/2 ELBOWS
15" CSP W/ 2 ELBOWS
FILL W/ FLOWABLE MATERIAL
REMOVE DI
REMOVE
FS-2
GREU TL-3
CAT-1
END WALL GUTTER STA. 975+00.00 RT. -WBL-
BEGIN WALL GUTTER STA. 976+00.00 RT. -WBL-
1401
1402
1403
1404
1405
1406
1407
1408
1409
1410
1411 OUT
1413
1414
1415
1416
1417
1418
1419
1419 OUT
12A
12
BL-12
-WBL- PT STA. 969+00.01
-WBL- PC STA. 973+16.45
WBL 965
WBL 970
WBL 975
48" WW W/ ISBW
EXISTING R/W
SHOULDER DRAIN OUTLET

FOR - EBL - PROFILE, SEE SHEET 45 & 46
FOR - WBL - PROFILE, SEE SHEET 45 & 46
FOR RETAINING WALL -RW8-, SEE SHEET W-7 & W-8
FOR RETAINING WALL -RW9-, SEE SHEET W-9

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PROJECT REFERENCE NO.	SHEET NO.
I-4700	15
R/W SHEET NO.	I-4700A-26
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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NAD 83

MATCHLINE SHEET 14
–EBL– STA. 977+92.00
–WBL– STA. 978+00.00

MATCHLINE SHEET 16
–EBL– STA 991+04.17
–WBL– STA 991+00.00

–EBL– PT STA. 977+92.00
–EBL– TS STA. 983+41.92
–EBL– SC STA. 984+88.92
EBL 980
EBL 985
EBL 990

–WBL– PT STA. 978+04.58
–WBL– TS STA. 980+90.49
–WBL– SC STA. 982+37.49
WBL 980
WBL 985
WBL 990

– EBL –
N 20° 31' 17.5" W

– WBL –
N 23° 31' 01.2" W

(12) PROGRESS ENERGY CAROLINAS, INC.
DB 828 PG 221
PB 34 PG 141

(13) RIVERLINK, INC.
DB 4843 PG 33

(14) HICKLIN HILL, LLC
DB 4743 PG 1390
DB 1992 PG 202

HOPE W. RYAN
DB 778 PG 284

RIVERLINK, INC.
DB 4843 PG 33

+40.00 –EBL–
135.00' LT
109.30' LT

+15.00 –EBL–
135.00' LT
109.20' LT

+40.00 –EBL–
109.26' LT

+70.00 –EBL–
200.00' LT
FOOTBRIDGE

+40.00 –EBL–
109.79' LT

+30.00 –EBL–
180.00' LT

+22.57 –EBL–
130.00' LT

CLASS 'B' RIPRAP
EST. 1 TONS
EST. 5 SYGF

DOWNSTREAM CHANNEL IMPROVEMENTS SEE DETAIL KKKK

EXTEND 2@ 10' X 10' RCBC

3 BARREL 10'X10' CONC BOX CULVERT (*)

CLASS '1' RIPRAP
EST. 15 TONS
EST. 30 SYGF

END SBG STA.
989+00.00 LT. –EBL–

FILL W/ FLOWABLE MATERIAL

PROP. GUARDRAIL

END SBG STA.
980+00.00 LT. –WBL–

TYPE B-77

DBL. FACED MEDIAN CONCRETE BARRIER

+37.50
2GI-B SG
+50.00 BEGIN MEDIAN SHLD TRANSITION

SINGLE FACED CONCRETE BARRIER

PROP. RETAINING WALL –RW9–

END SBG STA.
986+00.00 RT. –WBL–

50:1 FDPS TRANSITION FROM 11'-8" AT STA. 980+25 TO 12'-0" AT STA. 980+42

+50.00 –WBL–
97.28' RT

+03.00 –WBL–
120.17' RT

+75.00 –WBL–
150.00' RT

+90.00 –WBL–
140.00' RT

+30.00 –WBL–
118.78' RT

PROP. GATE

UPSTREAM CHANNEL IMPROVEMENTS SEE DETAIL JJJJ

2' LAT. BASE DITCH
SEE DETAIL JJ
EST. 95 SYGF
EST. 856 CY DDE

SPEC. LAT. 'V' DITCH
SEE DETAIL GG

BEGIN SBG STA.
990+50.00 RT. –WBL–

BERM DITCH
SEE DETAIL B
EST. 100 SYGF

JB W/MH

36" RCP-IV

HW

EXISTING ACCESS POINT FOR CAROLINA POWER AND LIGHT PER DB 894 PG 175

FOR – EBL – PROFILE, SEE SHEET 46 & 47
FOR – WBL – PROFILE, SEE SHEET 46 & 47
FOR RETAINING WALL –RW9–, SEE SHEET W-9

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PROJECT REFERENCE NO.	SHEET NO.
I-4700	16
R/W SHEET NO.	I-4700A-27

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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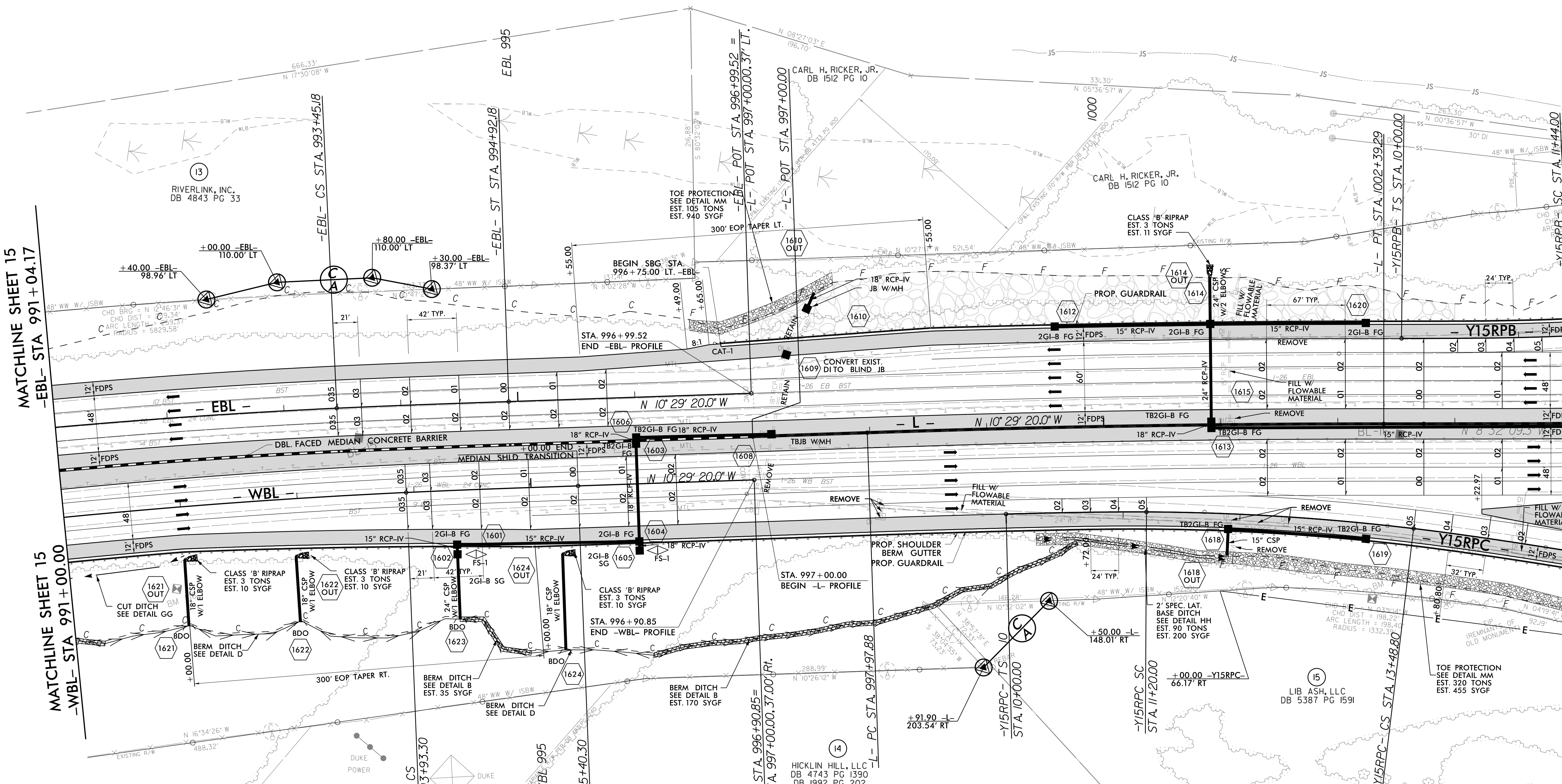
REVISIONS



FOR – L – PROFILE, SEE SHEET 47 & 48
FOR – EBL – PROFILE, SEE SHEET 47
FOR – WBL – PROFILE, SEE SHEET 47
FOR – Y15RPB – PROFILE, SEE SHEET 66
FOR – Y15RPC – PROFILE, SEE SHEET 67

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REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
I-4700	17
R/W SHEET NO.	I-4700A-28
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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★ PROPOSED TRAFFIC SIGNAL

NAD 83

MATCHLINE SHEET 16
–L– STA. 1004+00.00

MATCHLINE SHEET 18
–L– STA 1017+00.00

MATCHLINE SHEET 35
–Y15– STA 55+00.00

FRENCH BROAD RIVER

CARL H. RICKER, JR.
DB 1512 PG 10

LIB ASH, LLC
DB 5387 PG 1591

–L– SC STA. 1006+75.55
–Y15RPB– CS STA. 14+70.83
–Y15RPB– ST STA. 16+62.83
–Y15RPA– PT STA. 23+56.22
–L– POC STA. 1014+48.00=
–Y15– POT STA. 50+00.00
△= 110°08'14"
–Y15RPB–
POT STA. 19+37.28
–Y15RPC– ST STA. 15+08.80
–Y15RPC– PC STA. 18+68.57
–Y15RPC– PT STA. 20+47.11
–Y15RPC– PC STA. 23+45.06
–Y15RPC– PT STA. 25+20.42
–Y15RPD– PT STA. 20+39.78
–Y15RPD– POT STA. 20+60.82
–Y15– PC STA. 50+72.69

360' LANE TAPER
PROP. GUARDRAIL
END SBG STA. 16+80.00 LT. –Y15RPB–
UNCLOG & RETAIN
BEGIN 2'-6" C&G STA. 1009+00.00 LT. –L–
200' SHOULDER TRANSITION
END 2'-6" C&G MATCH EXIST.
TIE TO EXISTING GUARDRAIL STA. 1012+87.70
TIE TO EXISTING APPROACH SLAB –L– STA. 1012+64.70
TIE TO EXISTING GUARDRAIL STA. 1012+43.12
TIE TO EXISTING GUARDRAIL STA. 1016+01.08
BEGIN 2'-6" C&G MATCH EXIST.
TIE TO EXISTING APPROACH SLAB –L– STA. 1015+67.39
TIE TO EXISTING GUARDRAIL STA. 1015+35.89
DBL. FACED MEDIAN CONCRETE BARRIER
CONVERT DI TO JB W/MH
CONVERT CB TO JB W/ MH
FILL W/ FLOWABLE MATERIAL
ADJUST MH
80' EOP TAPER LT
120' EOP TAPER LT
SPEC. LAT. 'V' DITCH SEE DETAIL OO
RETAIN/UNE W/APPROVED LINER
PROP. 2'-6" CURB AND GUTTER
END SBG STA. 17+60.00 RT –Y15RPC–
BEGIN MILL AND OVERLAY STA. 18+25.00 –Y15RPC–
END MILL AND OVERLAY STA. 22+07.30 –Y15RPC–
BEGIN MILL AND OVERLAY STA. 33+55.00 –Y15–
+43.35 –Y15RPC– 70.00' RT
+50.00 –Y15RPC– 80.00' RT
+80.00 –Y15RPC– 72.63' RT

FOR –L– PROFILE, SEE SHEET 48
FOR –Y15RPB– PROFILE, SEE SHEET 66
FOR –Y15RPC– PROFILE, SEE SHEET 67
FOR –Y15RPD– PROFILE, SEE SHEET 68

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

HNTB NORTH CAROLINA, P.C.

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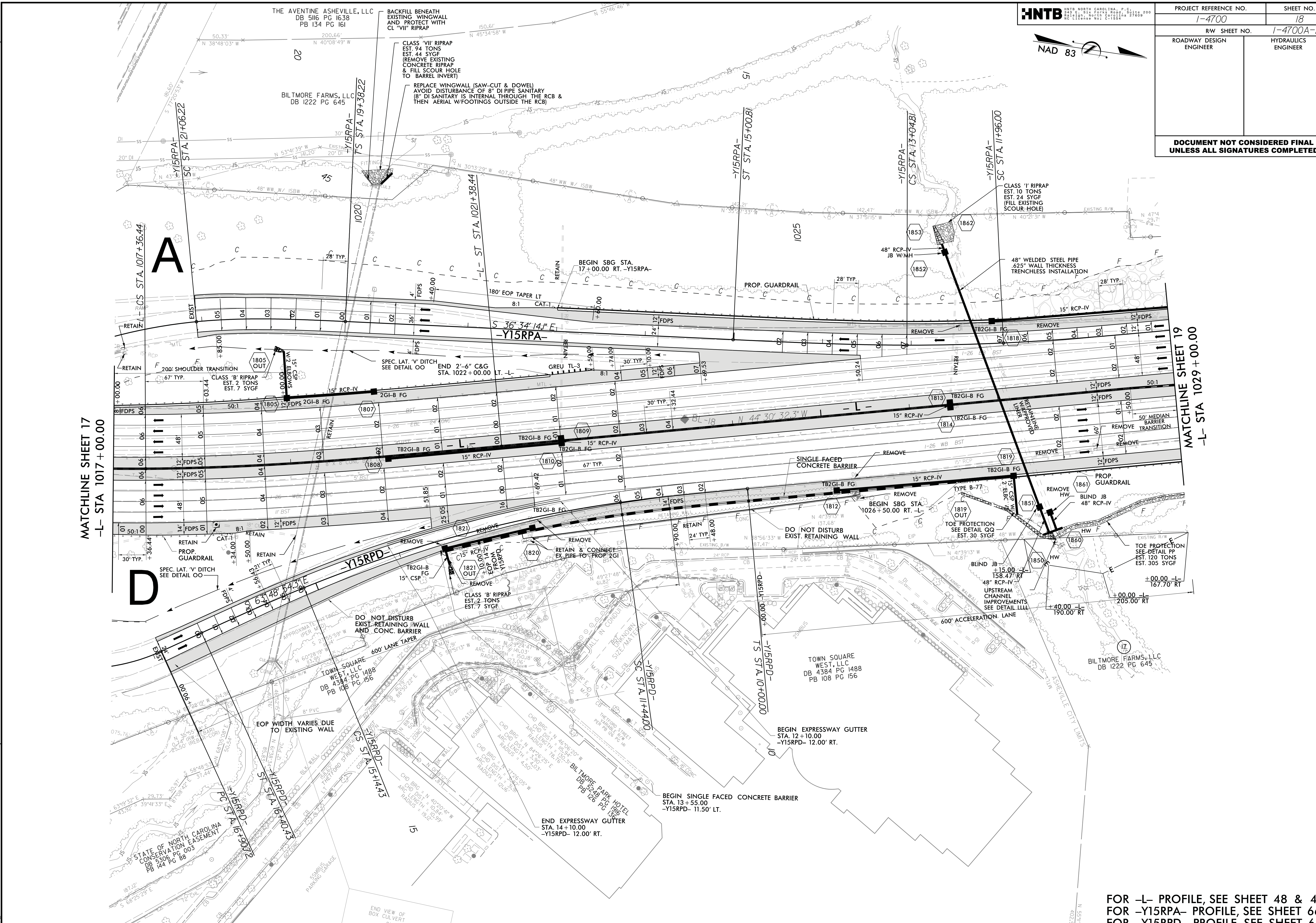

NAD 83
THE AVENTINE ASHEVILLE, LLC
DB 5116 PG 1638
PB 134 PG 161
BACKFILL BENEATH EXISTING WINGWALL AND PROTECT WITH CL "VII" RIPRAP
CLASS 'VII' RIPRAP EST. 94 TONS EST. 44 SYGF (REMOVE EXISTING CONCRETE RIPRAP & FILL SCOUR HOLE TO BARREL INVERT)
REPLACE WINGWALL (SAW-CUT & DOWEL) AVOID DISTURBANCE OF 8" DI PIPE SANITARY (8" DI SANITARY IS INTERNAL THROUGH THE RCB & THEN AERIAL W/FOOTINGS OUTSIDE THE RCB)
BILTMORE FARMS, LLC
DB 1222 PG 645
-Y15RPA- SC STA. 21+06.22
-Y15RPA- TS STA. 19+38.22
-L- ST STA. 1021+38.44
-Y15RPA- ST STA. 15+00.81
-Y15RPA- CS STA. 13+04.81
-Y15RPA- SC STA. 11+96.00
-L- CS STA. 1017+36.44
CLASS 'I' RIPRAP EST. 10 TONS EST. 24 SYGF (FILL EXISTING SCOUR HOLE)
48" RCP-IV JB W/MH
48" WELDED STEEL PIPE .625" WALL THICKNESS TRENCHLESS INSTALLATION
BEGIN SBG STA. 17+00.00 RT. -Y15RPA-
PROP. GUARDRAIL
180' EOP TAPER LT
S 36°34'14.1" E
-Y15RPA-
SPEC. LAT. 'V' DITCH SEE DETAIL OO
END 2'-6" C&G STA. 1022+00.00 LT. -L-
GREU TL-3
200' SHOULDER TRANSITION
CLASS 'B' RIPRAP EST. 2 TONS EST. 7 SYGF
A
MATCHLINE SHEET 17 -L- STA 1017+00.00
MATCHLINE SHEET 19 -L- STA 1029+00.00
N 44°30'32.3" W
BL-18
-L-
SINGLE FACED CONCRETE BARRIER
BEGIN SBG STA. 1026+50.00 RT. -L-
DO NOT DISTURB EXIST. RETAINING WALL
RETAIN & CONNECT EX. PIPE TO PROP. 2GI
TOE PROTECTION SEE DETAIL QQ EST. 30 SYGF
TOE PROTECTION SEE DETAIL PP EST. 120 TONS EST. 305 SYGF
BLIND JB 48" RCP-IV
UPSTREAM CHANNEL IMPROVEMENTS SEE DETAIL LLLL
600' ACCELERATION LANE
50' MEDIAN BARRIER TRANSITION
PROP. GUARDRAIL
-Y15RPD-
S 63°48'54.3" E
D
CLASS 'B' RIPRAP EST. 2 TONS EST. 7 SYGF
DO NOT DISTURB EXIST. RETAINING WALL AND CONC. BARRIER
600' LANE TAPER
TOWN SQUARE WEST, LLC DB 4384 PG 1488 PB 108 PG 156
EOP WIDTH VARIES DUE TO EXISTING WALL
-Y15RPD- SC STA. 11+44.00
-Y15RPD- TS STA. 10+00.00
-Y15RPD- CS STA. 15+14.43
-Y15RPD- ST STA. 16+40.43
-Y15RPD- PC STA. 16+90.72
BEGIN EXPRESSWAY GUTTER STA. 12+10.00 -Y15RPD- 12.00' RT.
BEGIN SINGLE FACED CONCRETE BARRIER STA. 13+55.00 -Y15RPD- 11.50' LT.
END EXPRESSWAY GUTTER STA. 14+10.00 -Y15RPD- 12.00' RT.
BILTMORE PARK HOTEL DB 5248 PG 1966 PB 126 PG 156
STATE OF NORTH CAROLINA CONSERVATION EASEMENT DB 5306 PG 003 PB 144 PG 88
BILTMORE FARMS, LLC DB 1222 PG 645
END VIEW OF BOX CULVERT
ASHEVILLE CITY LIMITS

FOR -L- PROFILE, SEE SHEET 48 & 49
FOR -Y15RPA- PROFILE, SEE SHEET 66
FOR -Y15RPD- PROFILE, SEE SHEET 68

REVISIONS

8/17/99

03-DEC-2018 16:33 I4700A_RDY_PSH_18.dgn HNTB

PROJECT REFERENCE NO.	SHEET NO.
I-4700	19
R/W SHEET NO.	I-4700A-29
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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

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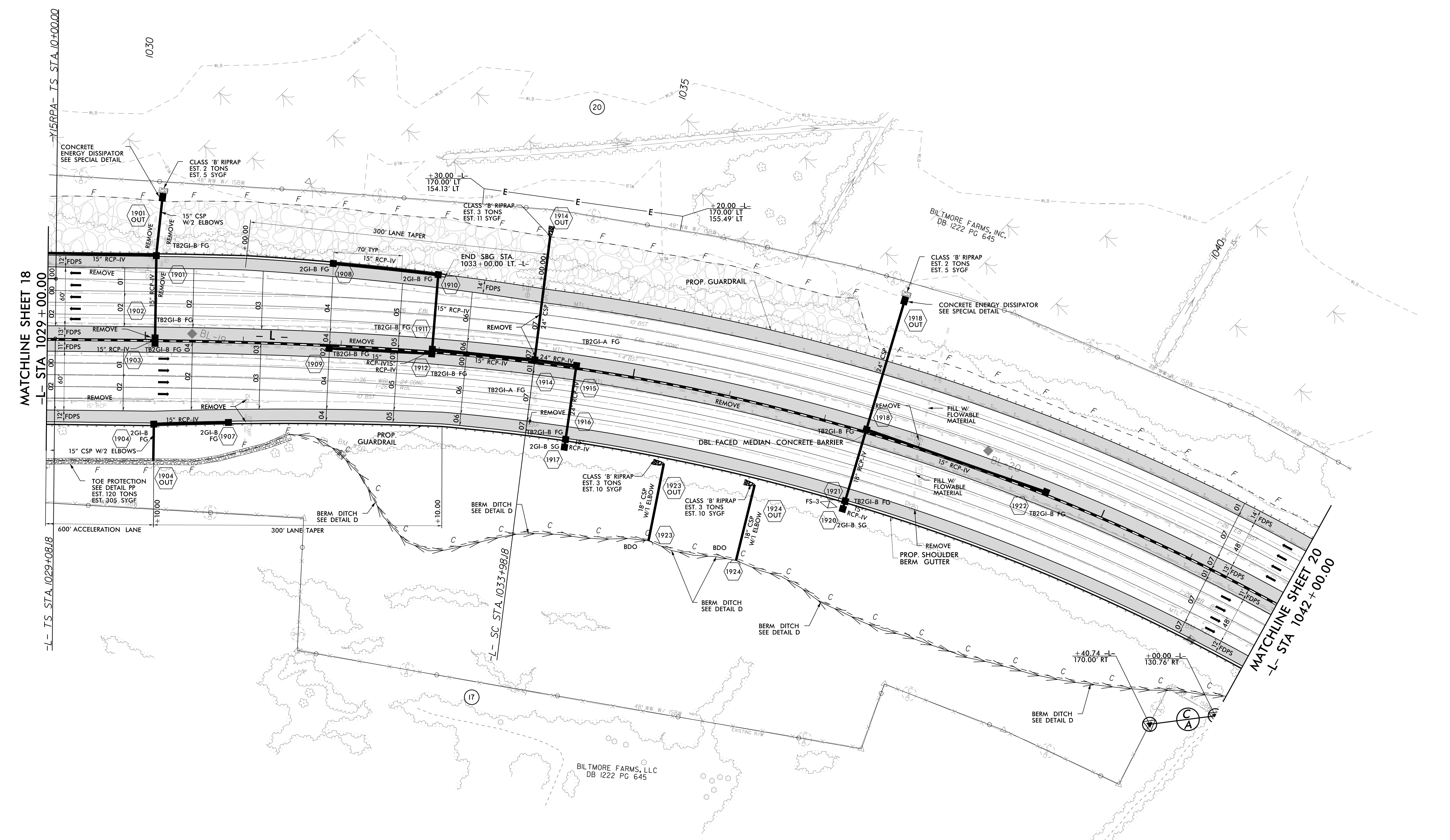

NAD 83
MATCHLINE SHEET 18
-L- STA 1029+00.00
MATCHLINE SHEET 20
-L- STA 1042+00.00
-Y15RPA- TS STA 10+00.00
-L- TS STA 1029+08.18
-L- SC STA 1033+98.18
CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL
CLASS 'B' RIPRAP EST. 2 TONS EST. 5 SYGF
CLASS 'B' RIPRAP EST. 3 TONS EST. 11 SYGF
CLASS 'B' RIPRAP EST. 3 TONS EST. 10 SYGF
15" CSP W/2 ELBOWS
300' LANE TAPER
70' TYP.
END SBG STA. 1033+00.00 LT. -L-
+30.00 -L- 170.00' LT 154.13' LT
+20.00 -L- 170.00' LT 155.49' LT
BILTMORE FARMS, INC. DB 1222 PG 645
PROP. GUARDRAIL
DBL. FACED MEDIAN CONCRETE BARRIER
FILL W/ FLOWABLE MATERIAL
TOE PROTECTION SEE DETAIL PP EST. 120 TONS EST. 305 SYGF
600' ACCELERATION LANE
BERM DITCH SEE DETAIL D
PROP. SHOULDER BERM GUTTER
+40.74 -L- 170.00' RT
+00.00 -L- 130.76' RT
BILTMORE FARMS, LLC DB 1222 PG 645

FOR – L – PROFILE, SEE SHEET 49

8/17/99

REVISIONS

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343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No. C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	20
R/W SHEET NO.	I-4700A-30
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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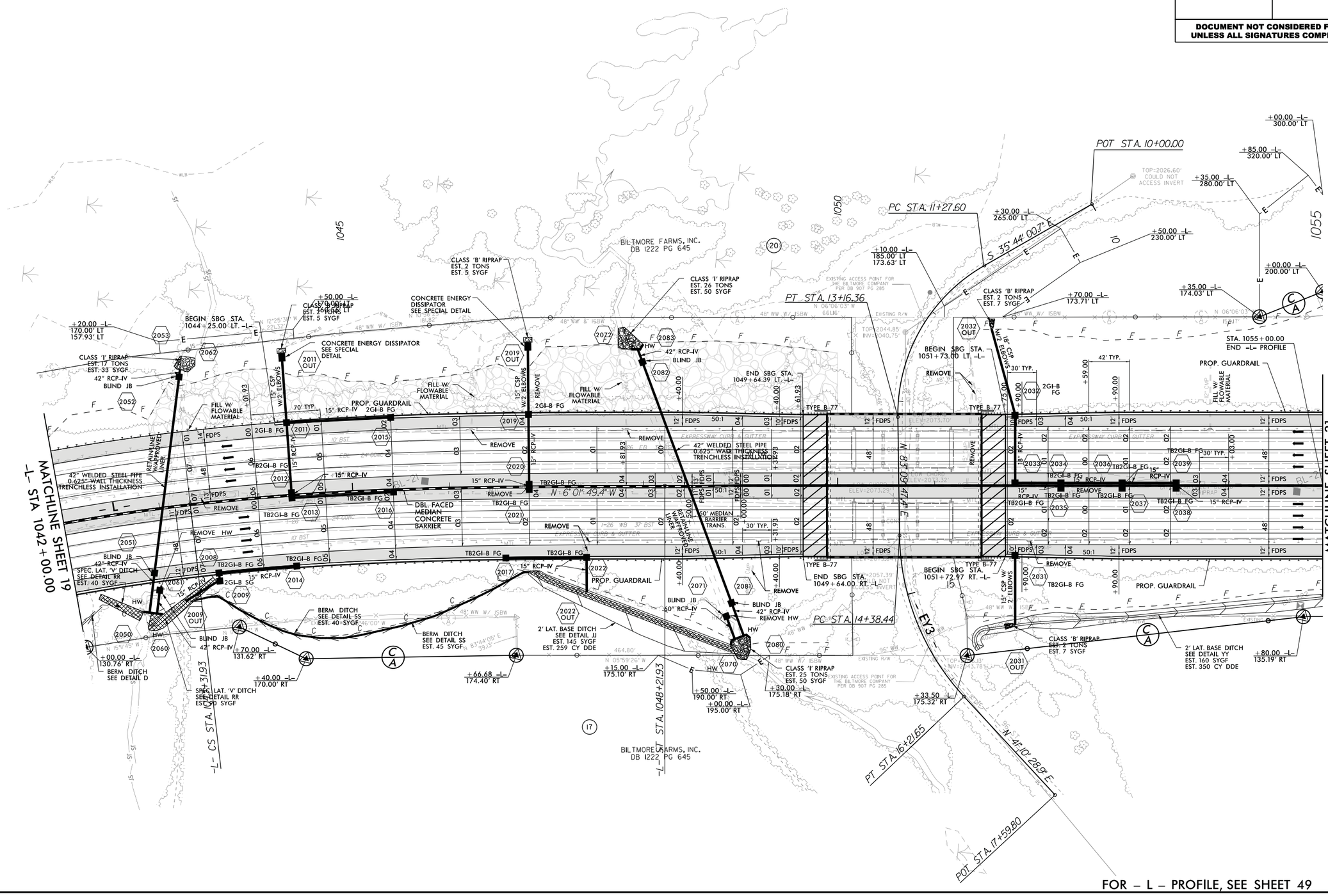
NAD 83



PROJECT REFERENCE NO.	SHEET NO.
I-4700	21
R/W SHEET NO.	I-4700B-31
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

HNTB NORTH CAROLINA, P.C.

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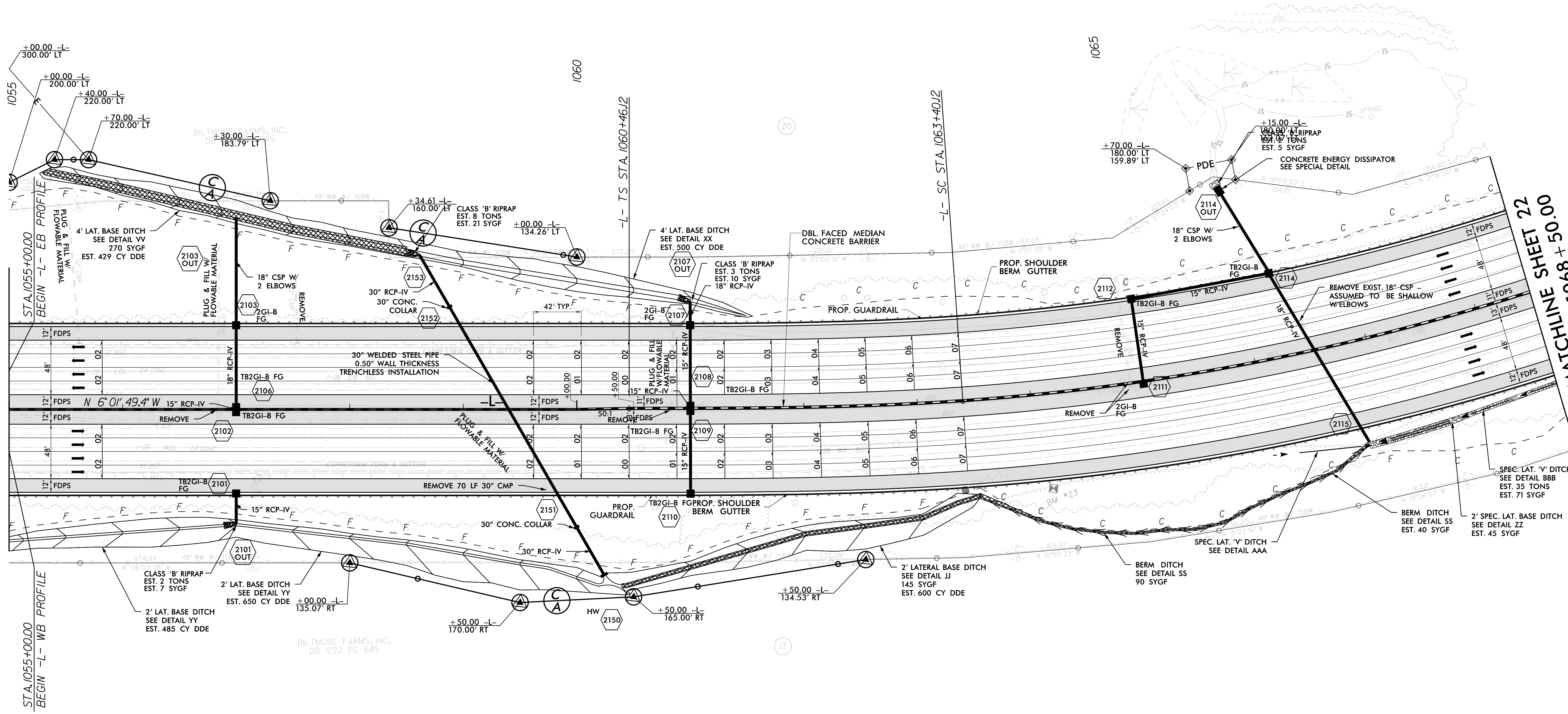
REVISIONS



FOR -L- EB & -L- WB PROFILES, SEE SHEET 50 & 51

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7/19/2017

PROJECT REFERENCE NO.	SHEET NO.
I-4700	22
R/W SHEET NO.	I-4700B-32
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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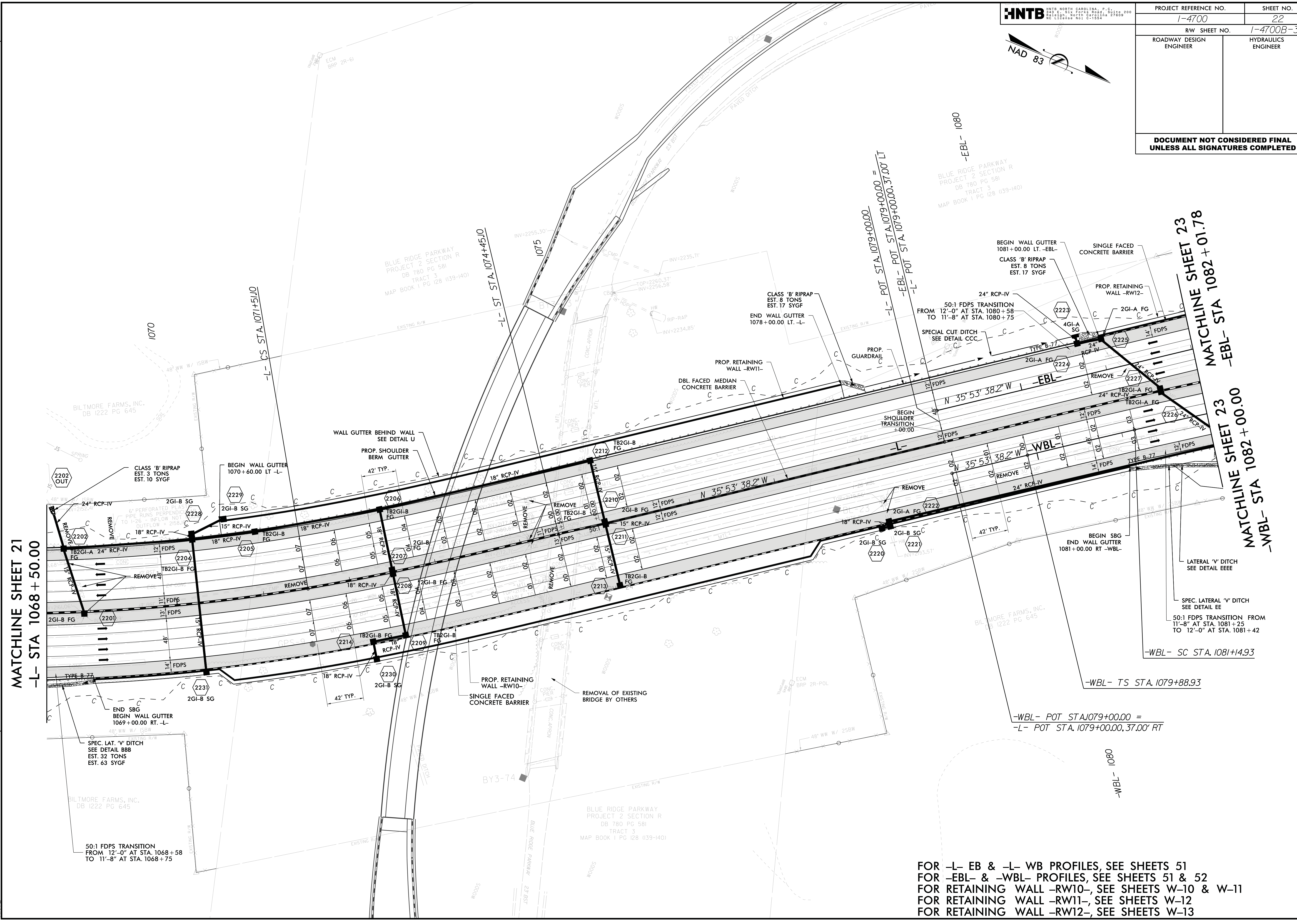

NAD 83
MATCHLINE SHEET 21 -L- STA 1068+50.00
MATCHLINE SHEET 23 -EBL- STA 1082+01.78
MATCHLINE SHEET 23 -WBL- STA 1082+00.00
-L- CS STA 1071+51.10
-L- ST STA 1074+45.10
-L- POT STA 1079+00.00
-EBL- POT STA 1079+00.00 = -L- POT STA 1079+00.00, 37.00' LT
-WBL- POT STA 1079+00.00 = -L- POT STA 1079+00.00, 37.00' RT
-WBL- TS STA 1079+88.93
-WBL- SC STA 1081+14.93
N 35°53' 38.2" W
BLUE RIDGE PARKWAY PROJECT 2 SECTION R DB 780 PG 581 TRACT 3 MAP BOOK 1 PG 128 (139-140)
BILTMORE FARMS, INC. DB 1222 PG 645
CLASS 'B' RIPRAP EST. 3 TONS EST. 10 SYGF
BEGIN WALL GUTTER 1070+60.00 LT -L-
WALL GUTTER BEHIND WALL SEE DETAIL U
PROP. SHOULDER BERM GUTTER
PROP. RETAINING WALL -RW10-
SINGLE FACED CONCRETE BARRIER
REMOVAL OF EXISTING BRIDGE BY OTHERS
PROP. RETAINING WALL -RW11-
DBL. FACED MEDIAN CONCRETE BARRIER
CLASS 'B' RIPRAP EST. 8 TONS EST. 17 SYGF
END WALL GUTTER 1078+00.00 LT. -L-
PROP. GUARDRAIL
SPECIAL CUT DITCH SEE DETAIL CCC
50:1 FDPS TRANSITION FROM 12'-0" AT STA. 1080+58 TO 11'-8" AT STA. 1080+75
BEGIN WALL GUTTER 1081+00.00 LT. -EBL-
SINGLE FACED CONCRETE BARRIER
PROP. RETAINING WALL -RW12-
BEGIN SHOULDER TRANSITION +00.00
BEGIN SBG END WALL GUTTER 1081+00.00 RT -WBL-
LATERAL 'V' DITCH SEE DETAIL EEEE
SPEC. LATERAL 'V' DITCH SEE DETAIL EE
50:1 FDPS TRANSITION FROM 11'-8" AT STA. 1081+25 TO 12'-0" AT STA. 1081+42
END SBG BEGIN WALL GUTTER 1069+00.00 RT. -L-
SPEC. LAT. 'V' DITCH SEE DETAIL BBB EST. 32 TONS EST. 63 SYGF
50:1 FDPS TRANSITION FROM 12'-0" AT STA. 1068+58 TO 11'-8" AT STA. 1068+75
42' TYP.

FOR -L- EB & -L- WB PROFILES, SEE SHEETS 51
FOR -EBL- & -WBL- PROFILES, SEE SHEETS 51 & 52
FOR RETAINING WALL -RW10-, SEE SHEETS W-10 & W-11
FOR RETAINING WALL -RW11-, SEE SHEETS W-12
FOR RETAINING WALL -RW12-, SEE SHEETS W-13

REVISIONS

7/19/2017

28-NOV-2018 10:00
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343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	23
R/W SHEET NO.	I-4700B-33
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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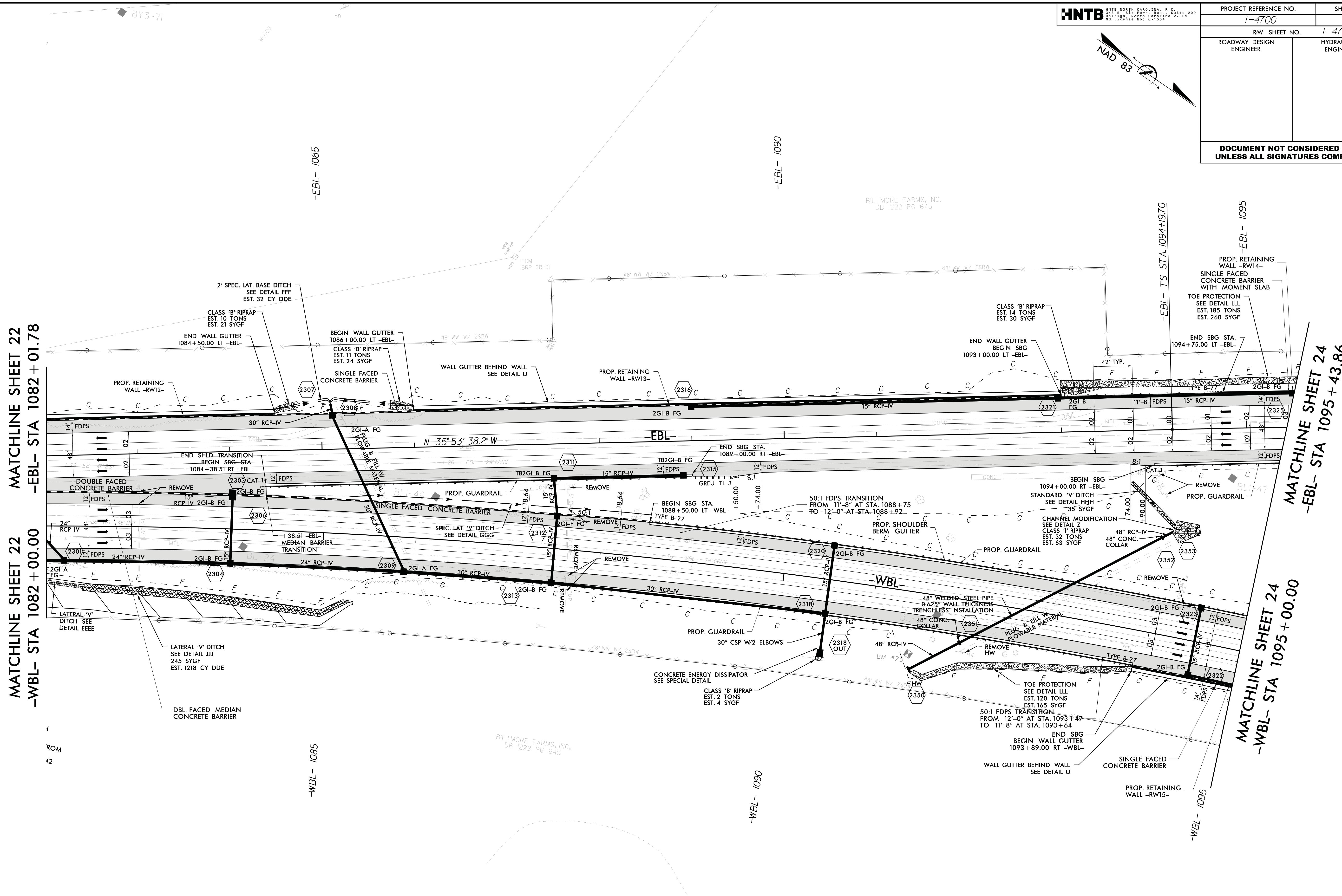
REVISIONS



NAD 83
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
-EBL- 1085
-EBL- 1090
-EBL- 1095
-WBL- 1085
-WBL- 1090
-WBL- 1095
-EBL- TS STA 1094+19.70
BILTMORE FARMS, INC. DB 1222 PG 645
-EBL-
N 35° 53' 38.2" W
-WBL-
2' SPEC. LAT. BASE DITCH SEE DETAIL FFF EST. 32 CY DDE
CLASS 'B' RIPRAP EST. 10 TONS EST. 21 SYGF
END WALL GUTTER 1084+50.00 LT -EBL-
PROP. RETAINING WALL -RW12-
BEGIN WALL GUTTER 1086+00.00 LT -EBL-
CLASS 'B' RIPRAP EST. 11 TONS EST. 24 SYGF
SINGLE FACED CONCRETE BARRIER
WALL GUTTER BEHIND WALL SEE DETAIL U
PROP. RETAINING WALL -RW13-
CLASS 'B' RIPRAP EST. 14 TONS EST. 30 SYGF
END WALL GUTTER BEGIN SBG 1093+00.00 LT -EBL-
PROP. RETAINING WALL -RW14-
SINGLE FACED CONCRETE BARRIER WITH MOMENT SLAB
TOE PROTECTION SEE DETAIL LLL EST. 185 TONS EST. 260 SYGF
END SBG STA. 1094+75.00 LT -EBL-
42' TYP.
END SHLD TRANSITION BEGIN SBG STA. 1084+38.51 RT -EBL-
DOUBLE FACED CONCRETE BARRIER
REMOVE
PROP. GUARDRAIL
SINGLE FACED CONCRETE BARRIER
SPEC. LAT. 'V' DITCH SEE DETAIL GGG
+38.51 -EBL- MEDIAN BARRIER TRANSITION
END SBG STA. 1089+00.00 RT -EBL-
GREU TL-3
BEGIN SBG STA. 1088+50.00 LT -WBL- TYPE B-77
50:1 FDPS TRANSITION FROM 11'-8" AT STA. 1088+75 TO 12'-0" AT STA. 1088+92
PROP. SHOULDER BERM GUTTER
BEGIN SBG 1094+00.00 RT -EBL-
STANDARD 'V' DITCH SEE DETAIL HHH 35 SYGF
CHANNEL MODIFICATION SEE DETAIL Z CLASS 'I' RIPRAP EST. 32 TONS EST. 63 SYGF
48" RCP-IV
48" CONC. COLLAR
PLUG & FILL W/ FLOWABLE MATERIAL
48" WELDED STEEL PIPE 0.625" WALL THICKNESS TRENCHLESS INSTALLATION
48" CONC. COLLAR
REMOVE HW
TOE PROTECTION SEE DETAIL LLL EST. 120 TONS EST. 165 SYGF
50:1 FDPS TRANSITION FROM 12'-0" AT STA. 1093+47 TO 11'-8" AT STA. 1093+64
END SBG BEGIN WALL GUTTER 1093+89.00 RT -WBL-
WALL GUTTER BEHIND WALL SEE DETAIL U
SINGLE FACED CONCRETE BARRIER
PROP. RETAINING WALL -RW15-
30" CSP W/2 ELBOWS
CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL
CLASS 'B' RIPRAP EST. 2 TONS EST. 4 SYGF
LATERAL 'V' DITCH SEE DETAIL EEEE
LATERAL 'V' DITCH SEE DETAIL JJJ 245 SYGF EST. 1218 CY DDE
DBL. FACED MEDIAN CONCRETE BARRIER
2301 2303 2304 2306 2307 2308 2309 2311 2312 2313 2315 2316 2318 2318 OUT 2320 2321 2323 2325 2327 2350 2351 2352 2353
2GI-A FG
2GI-B FG
2GI-F FG
TB2GI-B FG
30" RCP-IV
24" RCP-IV
15" RCP-IV
FDPS
CAT-1
TYPE B-77
BY3-71
ECM BRP 2R-91
48" WW W/ 2SBW

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

HNTB NORTH CAROLINA, P.C.

PROJECT REFERENCE NO.	SHEET NO.
I-4700	24
R/W SHEET NO.	I-4700B-34
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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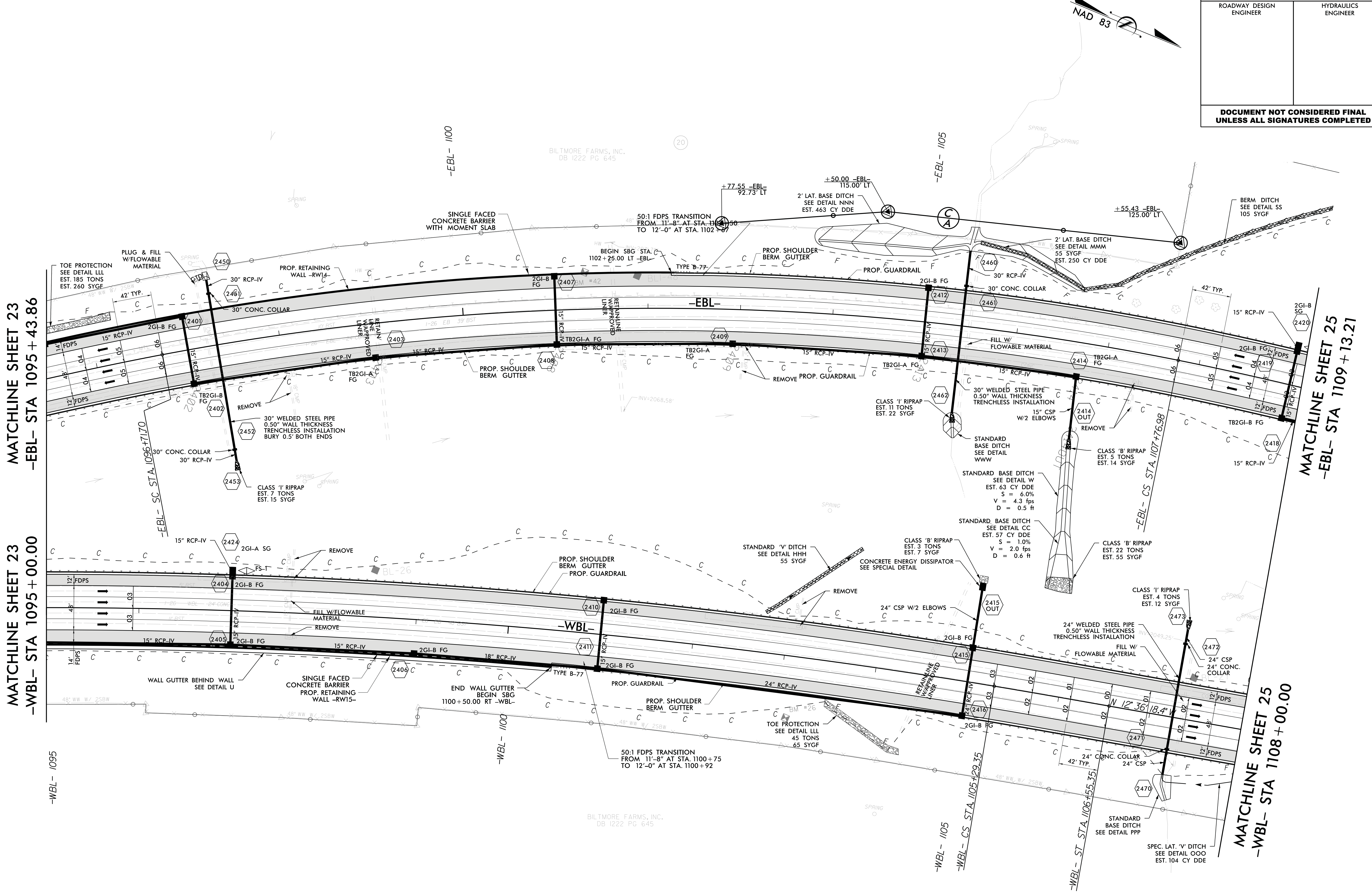
REVISIONS


NAD 83
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
BILTMORE FARMS, INC. DB 1222 PG 645
-EBL-
-WBL-
-EBL- 1100
-EBL- 1105
-WBL- 1095
-WBL- 1100
-WBL- 1105
-EBL- SC STA 1096+17.70
-EBL- CS STA 1107+76.98
-WBL- CS STA 1105+29.35
-WBL- ST STA 1106+55.35
TOE PROTECTION SEE DETAIL LLL EST. 185 TONS EST. 260 SYGF
PLUG & FILL W/FLOWABLE MATERIAL
SINGLE FACED CONCRETE BARRIER WITH MOMENT SLAB
PROP. RETAINING WALL -RW14-
50:1 FDPS TRANSITION FROM 11'-8" AT STA. 1101+50 TO 12'-0" AT STA. 1102+67
BEGIN SBG STA. 1102+25.00 LT -EBL-
TYPE B-77
PROP. SHOULDER BERM GUTTER
PROP. GUARDRAIL
+77.55 -EBL- 92.73' LT
+50.00 -EBL- 115.00' LT
2' LAT. BASE DITCH SEE DETAIL NNN EST. 463 CY DDE
2' LAT. BASE DITCH SEE DETAIL MMM 55 SYGF EST. 250 CY DDE
+55.43 -EBL- 125.00' LT
BERM DITCH SEE DETAIL SS 105 SYGF
30" RCP-IV
30" CONC. COLLAR
30" WELDED STEEL PIPE 0.50" WALL THICKNESS TRENCHLESS INSTALLATION BURY 0.5' BOTH ENDS
CLASS 'I' RIPRAP EST. 7 TONS EST. 15 SYGF
CLASS 'I' RIPRAP EST. 11 TONS EST. 22 SYGF
30" WELDED STEEL PIPE 0.50" WALL THICKNESS TRENCHLESS INSTALLATION
FILL W/ FLOWABLE MATERIAL
STANDARD BASE DITCH SEE DETAIL WWW
15" CSP W/2 ELBOWS
REMOVE
CLASS 'B' RIPRAP EST. 5 TONS EST. 14 SYGF
STANDARD BASE DITCH SEE DETAIL W EST. 63 CY DDE S = 6.0% V = 4.3 fps D = 0.5 ft
STANDARD BASE DITCH SEE DETAIL CC EST. 57 CY DDE S = 1.0% V = 2.0 fps D = 0.6 ft
CLASS 'B' RIPRAP EST. 22 TONS EST. 55 SYGF
STANDARD 'V' DITCH SEE DETAIL HHH 55 SYGF
CLASS 'B' RIPRAP EST. 3 TONS EST. 7 SYGF
CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL
24" CSP W/2 ELBOWS
CLASS 'I' RIPRAP EST. 4 TONS EST. 12 SYGF
24" WELDED STEEL PIPE 0.50" WALL THICKNESS TRENCHLESS INSTALLATION
24" CSP
24" CONC. COLLAR
WALL GUTTER BEHIND WALL SEE DETAIL U
SINGLE FACED CONCRETE BARRIER PROP. RETAINING WALL -RW15-
END WALL GUTTER BEGIN SBG 1100+50.00 RT -WBL-
TOE PROTECTION SEE DETAIL LLL 45 TONS 65 SYGF
50:1 FDPS TRANSITION FROM 11'-8" AT STA. 1100+75 TO 12'-0" AT STA. 1100+92
STANDARD BASE DITCH SEE DETAIL PPP
SPEC. LAT. 'V' DITCH SEE DETAIL OOO EST. 104 CY DDE
RETAINLINE W/APPROVED LINER
N 12°36'18.4" W
42' TYP.
FDPS
15" RCP-IV
18" RCP-IV
24" RCP-IV
2GI-B FG
2GI-A SG
TB2GI-A FG
TB2GI-B FG
FS-1
SPRING

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

7/19/2017

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PROJECT REFERENCE NO.	SHEET NO.
I-4700	25
R/W SHEET NO.	I-4700B-35
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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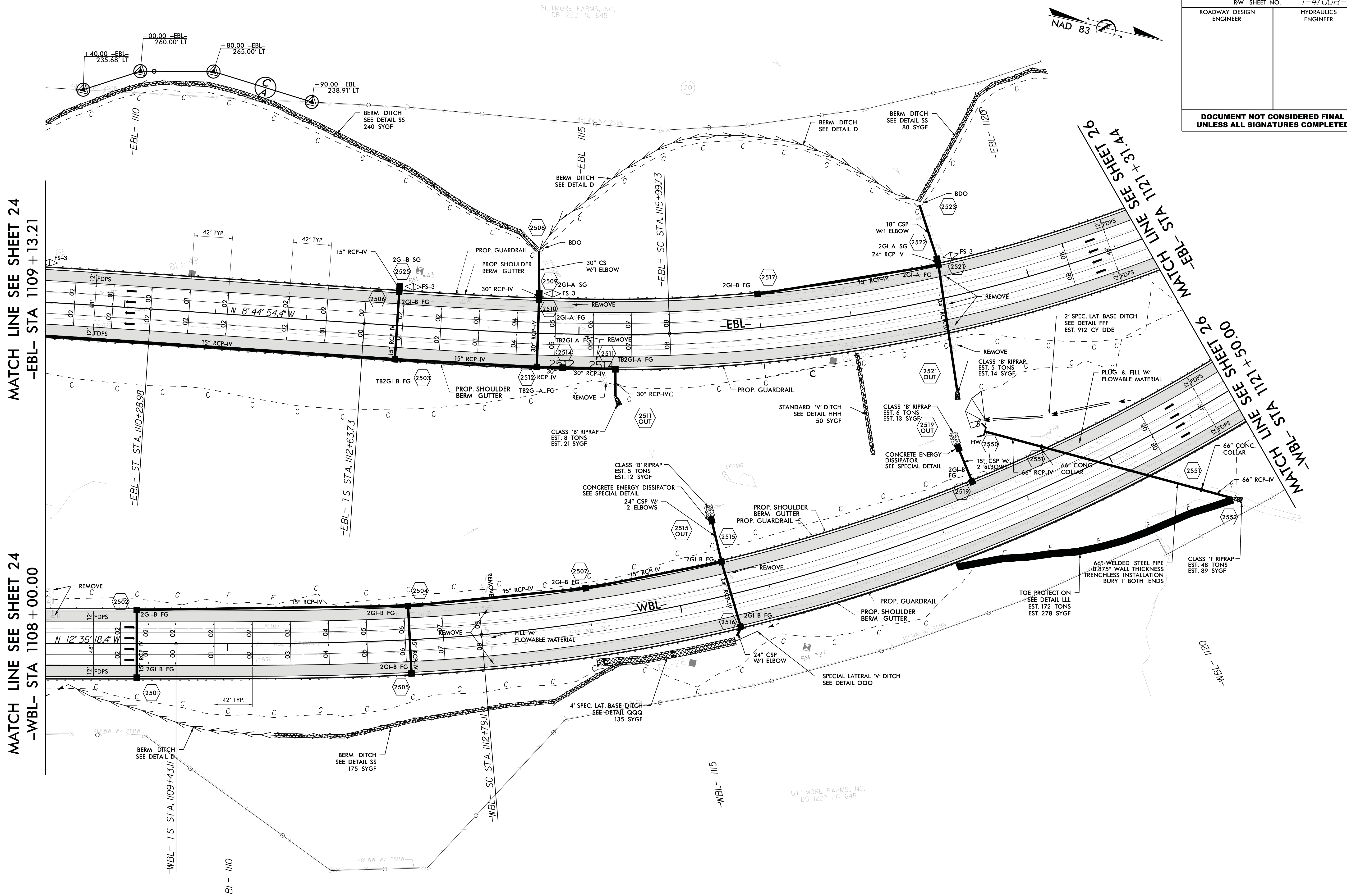
REVISIONS

7/19/2017



NAD 83
BILTMORE FARMS, INC. DB 1222 PG 645
+40.00 -EBL- 235.68' LT
+00.00 -EBL- 260.00' LT
+80.00 -EBL- 265.00' LT
+90.00 -EBL- 238.91' LT
BERM DITCH SEE DETAIL SS 240 SYGF
BERM DITCH SEE DETAIL D
BERM DITCH SEE DETAIL SS 80 SYGF
BDO
18" CSP W/1 ELBOW
2GI-A SG
24" RCP-IV
FS-3
REMOVE
2' SPEC. LAT. BASE DITCH SEE DETAIL FFF EST. 912 CY DDE
CLASS 'B' RIPRAP EST. 5 TONS EST. 14 SYGF
PLUG & FILL W/ FLOWABLE MATERIAL
MATCH LINE SEE SHEET 26 -EBL- STA 1121+31.44
MATCH LINE SEE SHEET 26 -WBL- STA 1121+50.00
MATCH LINE SEE SHEET 24 -EBL- STA 1109+13.21
MATCH LINE SEE SHEET 24 -WBL- STA 1108+00.00
42' TYP.
15" RCP-IV
2GI-B SG
PROP. GUARDRAIL
PROP. SHOULDER BERM GUTTER
30" CS W/1 ELBOW
30" RCP-IV
2GI-A SG
2GI-B FG
2GI-A FG
N 8° 44' 54.4" W
-EBL-
TB2GI-A FG
TB2GI-B FG
30" RCP-IV
CLASS 'B' RIPRAP EST. 8 TONS EST. 21 SYGF
STANDARD 'V' DITCH SEE DETAIL HHH 50 SYGF
CLASS 'B' RIPRAP EST. 6 TONS EST. 13 SYGF
CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL
15" CSP W/ 2 ELBOWS
66" RCP-IV
66" CONC. COLLAR
CLASS 'B' RIPRAP EST. 5 TONS EST. 12 SYGF
24" CSP W/ 2 ELBOWS
66" WELDED STEEL PIPE 0.875" WALL THICKNESS TRENCHLESS INSTALLATION BURY 1' BOTH ENDS
CLASS 'I' RIPRAP EST. 48 TONS EST. 89 SYGF
TOE PROTECTION SEE DETAIL LLL EST. 172 TONS EST. 278 SYGF
N 12° 36' 18.4" W
-WBL-
FILL W/ FLOWABLE MATERIAL
24" CSP W/1 ELBOW
SPECIAL LATERAL 'V' DITCH SEE DETAIL OOO
4' SPEC. LAT. BASE DITCH SEE DETAIL QQQ 135 SYGF
BERM DITCH SEE DETAIL D
BERM DITCH SEE DETAIL SS 175 SYGF
-EBL- ST STA. 1110+28.98
-EBL- TS STA. 1112+63.73
-EBL- SC STA. 1115+99.73
-WBL- TS STA. 1109+43.11
-WBL- SC STA. 1112+79.11
-EBL- 1110
-EBL- 1115
-EBL- 1120
-WBL- 1115
-WBL- 1120
BL- 1110

FOR -WBL- & -EBL- PROFILES, SEE SHEETS 53 & 54

28-NOV-2018 10:00
I4700B_RDY_PSH_25.dgn
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343 E. Six Forks Road, Suite 200
Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	26
R/W SHEET NO.	I-4700B-36
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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7/19/2017

REVISIONS

NAD 83

1135

MATCHLINE SHEET 25
–WBL– STA 1121+50.00

MATCHLINE SHEET 25
–EBL– STA 1121+31.44

MATCHLINE SHEET 27
–L– STA 1135+00.00

–EBL– 1125

–EBL– CS STA 1127+86.23

–EBL– 1130

–EBL– ST STA 1131+22.23

–EBL– POT STA 1132+40.49 = –L– POT STA 1133+00.00, 37.00' LT

–L– POT STA 1133+00.00

–WBL– CS STA 1125+90.81

–WBL– ST STA 1129+26.81

–WBL– 1130

–WBL– 1125

–WBL– POT STA 1133+00.00 = –L– POT STA 1133+00.00, 37.00' RT

BERM DITCH SEE DETAIL SS 230 SYGF

50:1 FDPS TRANSITION FROM 12'–0" AT STA. 1123+58 TO 11'–8" AT STA. 1123+75

BD300 18" CSP W/1 ELBOW

+58.36 –EBL– 110.00' LT

+50.00 –EBL– 91.27' LT

+50.00 –WBL– MEDIAN BARRIER TRANSITION

4GI-A SG 24" RCP-IV

PROP. GUARDRAIL

+85.00 –EBL– 87.94' LT

2' LATERAL BASE DITCH SEE DETAIL NNN EST. 673 CY DDE

+25.00 –EBL– 89.84' LT

+00.00 –EBL– 115.00' LT

+00.00 –EBL– 110.00' LT

+40.00 –EBL– 130.00' LT

+90.00 –EBL– 87.28' LT

+5.00 –L– 124.18' LT

TOE PROTECTION SEE DETAIL TTT EST. 254 TONS EST. 549 SYGF

PROP. SHOULDER BERM GUTTER

60" CONC. COLLAR

FILL W/ FLOWABLE MATERIAL

DBL FACED MEDIAN CONCRETE BARRIER

SINGLE FACED CONCRETE BARRIER

SPEC. LAT. 'V' DITCH SEE DETAIL OOO

SPEC. LAT. 'V' DITCH SEE DETAIL UUU EST. 15 TONS EST. 30 SYGF

TYPE B–77

END SBG STA. 1123+99.90 RT –EBL–

SPECIAL LATERAL 'V' DITCH SEE DETAIL OOO

2GI-SPECIAL DESIGN SG

END SBG STA. 1128+50.00 LT –WBL–

60" RCP-IV

60" WELDED STEEL PIPE 0.875" WALL THICKNESS TRENCHLESS INSTALLATION BURY 1' BOTH ENDS

JB W/HH 60" RCP-IV

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

CLASS 'B' RIPRAP EST. 2 TONS EST. 5 SYGF

CLASS 'I' RIPRAP EST. 33 TONS EST. 62 SYGF

24" CSP W/ 2 ELBOWS

REMOVE

N 62° 02' 09.9" W

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

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Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4700	27
R/W SHEET NO.	I-4700B-37
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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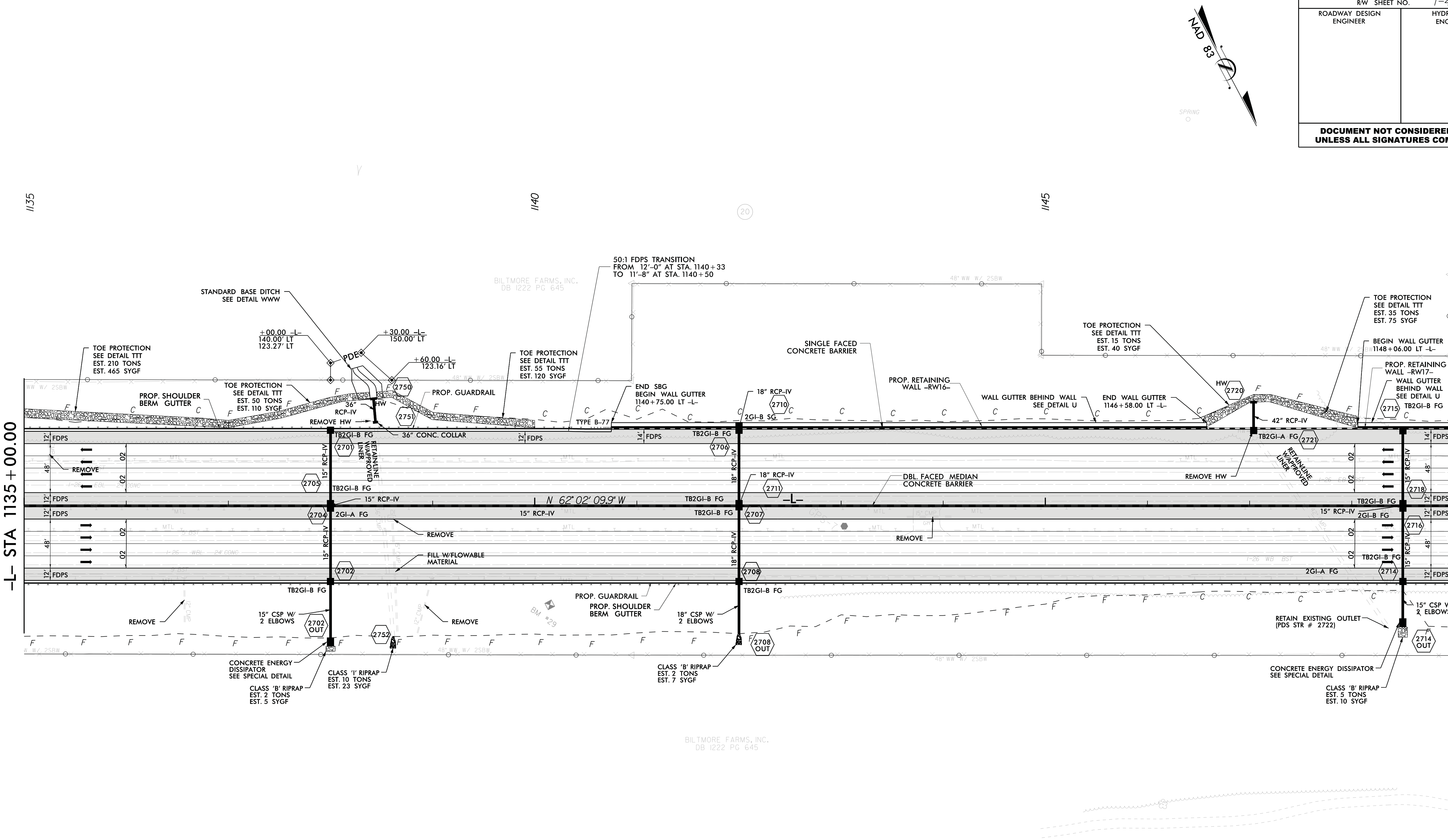
REVISIONS

7/19/2017

MATCHLINE SHEET 26 -L- STA 1135+00.00



NAD 83
1135
1140
1145
STANDARD BASE DITCH SEE DETAIL WWW
TOE PROTECTION SEE DETAIL TTT EST. 210 TONS EST. 465 SYGF
PROP. SHOULDER BERM GUTTER
TOE PROTECTION SEE DETAIL TTT EST. 50 TONS EST. 110 SYGF
+00.00 -L- 140.00' LT 123.27' LT
+30.00 -L- 150.00' LT
+60.00 -L- 123.16' LT
PROP. GUARDRAIL
TOE PROTECTION SEE DETAIL TTT EST. 55 TONS EST. 120 SYGF
50:1 FDPS TRANSITION FROM 12'-0" AT STA. 1140+33 TO 11'-8" AT STA. 1140+50
BILTMORE FARMS, INC. DB 1222 PG 645
END SBG BEGIN WALL GUTTER 1140+75.00 LT -L-
TYPE B-77
SINGLE FACED CONCRETE BARRIER
PROP. RETAINING WALL -RW16-
WALL GUTTER BEHIND WALL SEE DETAIL U
END WALL GUTTER 1146+58.00 LT -L-
TOE PROTECTION SEE DETAIL TTT EST. 15 TONS EST. 40 SYGF
TOE PROTECTION SEE DETAIL TTT EST. 35 TONS EST. 75 SYGF
BEGIN WALL GUTTER 1148+06.00 LT -L-
PROP. RETAINING WALL -RW17-
WALL GUTTER BEHIND WALL SEE DETAIL U
36" RCP-IV
REMOVE HW
36" CONC. COLLAR
RETAIN LINE W/APPROVED LINER
18" RCP-IV
42" RCP-IV
REMOVE HW
N 62° 02' 09.9" W
-L-
DBL. FACED MEDIAN CONCRETE BARRIER
15" RCP-IV
REMOVE
FILL W/FLOWABLE MATERIAL
PROP. GUARDRAIL
PROP. SHOULDER BERM GUTTER
15" CSP W/ 2 ELBOWS
18" CSP W/ 2 ELBOWS
RETAIN EXISTING OUTLET (PDS STR # 2722)
CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL
CLASS 'B' RIPRAP EST. 2 TONS EST. 5 SYGF
CLASS 'I' RIPRAP EST. 10 TONS EST. 23 SYGF
CLASS 'B' RIPRAP EST. 2 TONS EST. 7 SYGF
CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL
CLASS 'B' RIPRAP EST. 5 TONS EST. 10 SYGF
BILTMORE FARMS, INC. DB 1222 PG 645

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

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PROJECT REFERENCE NO.	SHEET NO.
I-4700	28
R/W SHEET NO.	I-4700B-38
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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NC License No: C-1554

NAD 83

7/19/2017

REVISIONS

MATCHLINE SHEET 27
–L– STA 1149+00.00

MATCHLINE SHEET 29
–L– STA 1163+00.00

1150 1155 1160

BILTMORE FARMS, INC.
DB 1222 PG 645

48" WW W/ 2SBW

WALL GUTTER BEHIND WALL SEE DETAIL U

SINGLE FACED CONCRETE BARRIER

PROP. RETAINING WALL –RW17–

2GI–B SG

4GI–B SG

15" CSP–IV

24" RCP–IV

15" RCP–IV

30" RCP–IV

18" RCP–IV

24" RCP–IV

2GI–A SG

TB2GI–B FG

TB2GI–A FG

2GI–B FG

2GI–A FG

FDPS

14' FDPS

12' FDPS

50:1

REMOVE

FILL W/ FLOWABLE MATERIAL

DBL FACED MEDIAN CONCRETE BARRIER

N 62° 02' 09.9" W

REMOVE PROP. SHOULDER BERM GUTTER

PROP. GUARDRAIL

15" CSP W/ FLOWABLE MATERIAL 2 ELBOWS

4' LATERAL BASE DITCH SEE DETAIL YYY EST. 290 CY DDE

CLASS 'B' RIPRAP EST. 2 TONS EST. 7 SYGF

4' LATERAL BASE DITCH SEE DETAIL YYY EST. 354 CY DDE

CLASS 'B' RIPRAP EST. 5 TONS EST. 14 SYGF

15" CSP CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

CLASS 'B' RIPRAP EST. 13 TONS EST. 28 SYGF

30" CSP W/2 ELBOWS

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

CLASS 'B' RIPRAP EST. 2 TONS EST. 5 SYGF

PROPOSED BRIDGE BENTS

RETAIN

END SBG STA 1160+10.49 RT –L–

42' TYP.

+25.00

+00.00

+70.00

2801 2802 2803 2804 2805 2806 2807 2808 2809 2810 2811 2812 2813 2814 2815 2816 2817 2818 2819 2820 2821 2822 2823 2824 2825 2826 2827 2828 2829 2830 2831 2832

2802 OUT 2808 OUT 2815 OUT 2822 OUT

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

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PROJECT REFERENCE NO.	SHEET NO.
I-4700	29
R/W SHEET NO.	I-4700B-39
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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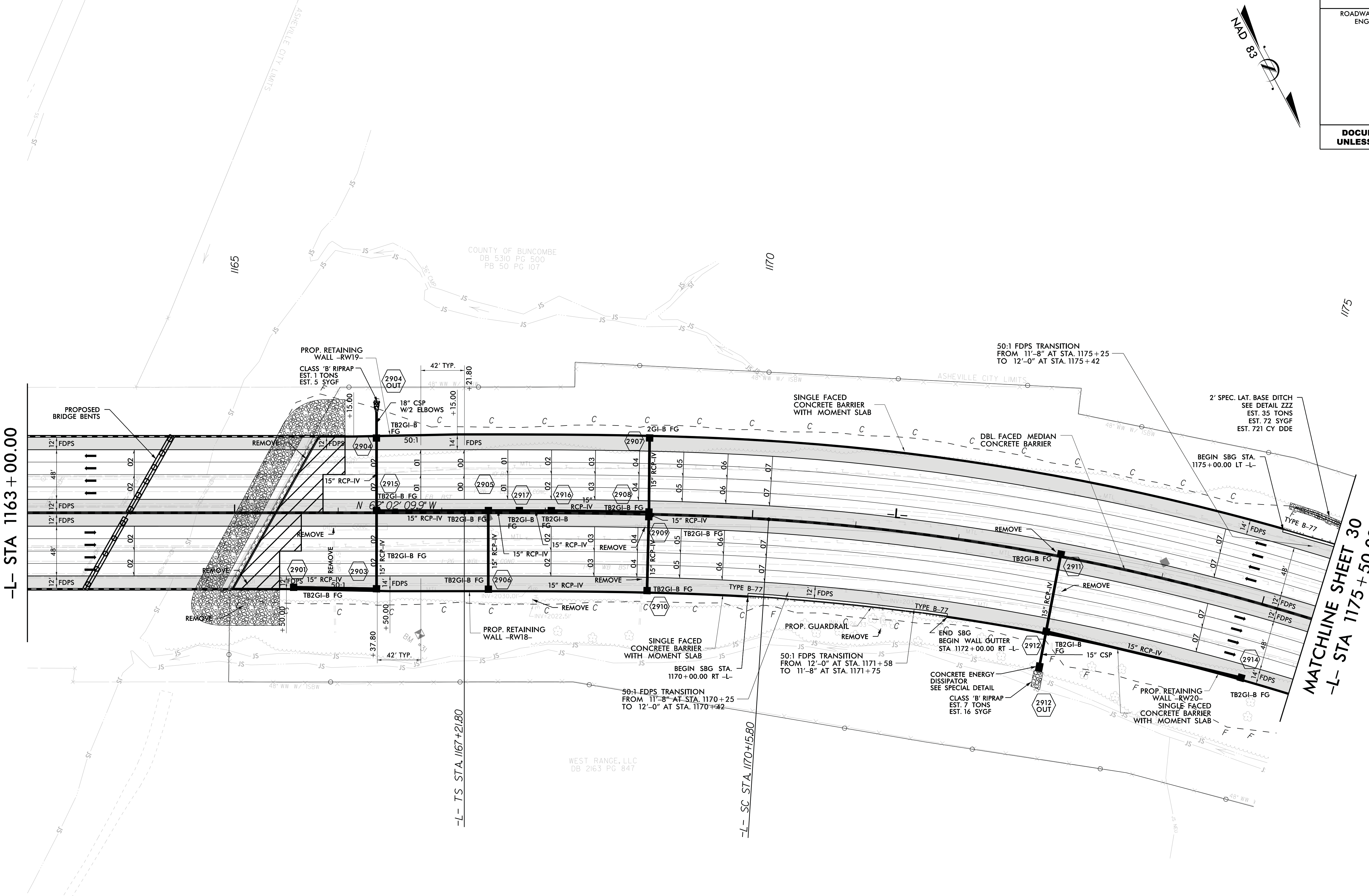
REVISIONS

7/19/2017



NAD 83
MATCHLINE SHEET 28
-L- STA 1163+00.00
MATCHLINE SHEET 30
-L- STA 1175+50.00
COUNTY OF BUNCOMBE
DB 5310 PG 500
PB 50 PG 107
WEST RANGE, LLC
DB 2163 PG 847
ASHEVILLE CITY LIMITS
PROPOSED BRIDGE BENTS
PROP. RETAINING WALL -RW19-
CLASS 'B' RIPRAP
EST. 1 TONS
EST. 5 SYGF
18" CSP W/2 ELBOWS
42' TYP.
PROP. RETAINING WALL -RW18-
-L- TS STA. 1167+21.80
-L- SC STA. 1170+15.80
SINGLE FACED CONCRETE BARRIER WITH MOMENT SLAB
BEGIN SBG STA. 1170+00.00 RT -L-
50:1 FDPS TRANSITION
FROM 11'-8" AT STA. 1170+25
TO 12'-0" AT STA. 1170+42
50:1 FDPS TRANSITION
FROM 12'-0" AT STA. 1171+58
TO 11'-8" AT STA. 1171+75
PROP. GUARDRAIL
END SBG
BEGIN WALL GUTTER
STA 1172+00.00 RT -L-
CONCRETE ENERGY DISSIPATOR
SEE SPECIAL DETAIL
CLASS 'B' RIPRAP
EST. 7 TONS
EST. 16 SYGF
50:1 FDPS TRANSITION
FROM 11'-8" AT STA. 1175+25
TO 12'-0" AT STA. 1175+42
DBL. FACED MEDIAN CONCRETE BARRIER
2' SPEC. LAT. BASE DITCH
SEE DETAIL ZZZ
EST. 35 TONS
EST. 72 SYGF
EST. 721 CY DDE
BEGIN SBG STA. 1175+00.00 LT -L-
PROP. RETAINING WALL -RW20-
SINGLE FACED CONCRETE BARRIER WITH MOMENT SLAB
N 62° 02' 09.9" W
TYPE B-77
FDPS
REMOVE
15" RCP-IV
TB2GI-B FG
2GI-B FG
15" CSP

FOR -L- EB & -L- WB PROFILES, SEE SHEETS 57 & 58
FOR RETAINING WALL -RW18-, SEE SHEETS W-19
FOR RETAINING WALL -RW19-, SEE SHEETS W-20
FOR RETAINING WALL -RW20-, SEE SHEETS W-21

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PROJECT REFERENCE NO.	SHEET NO.
I-4700	30
R/W SHEET NO.	I-4700B-40
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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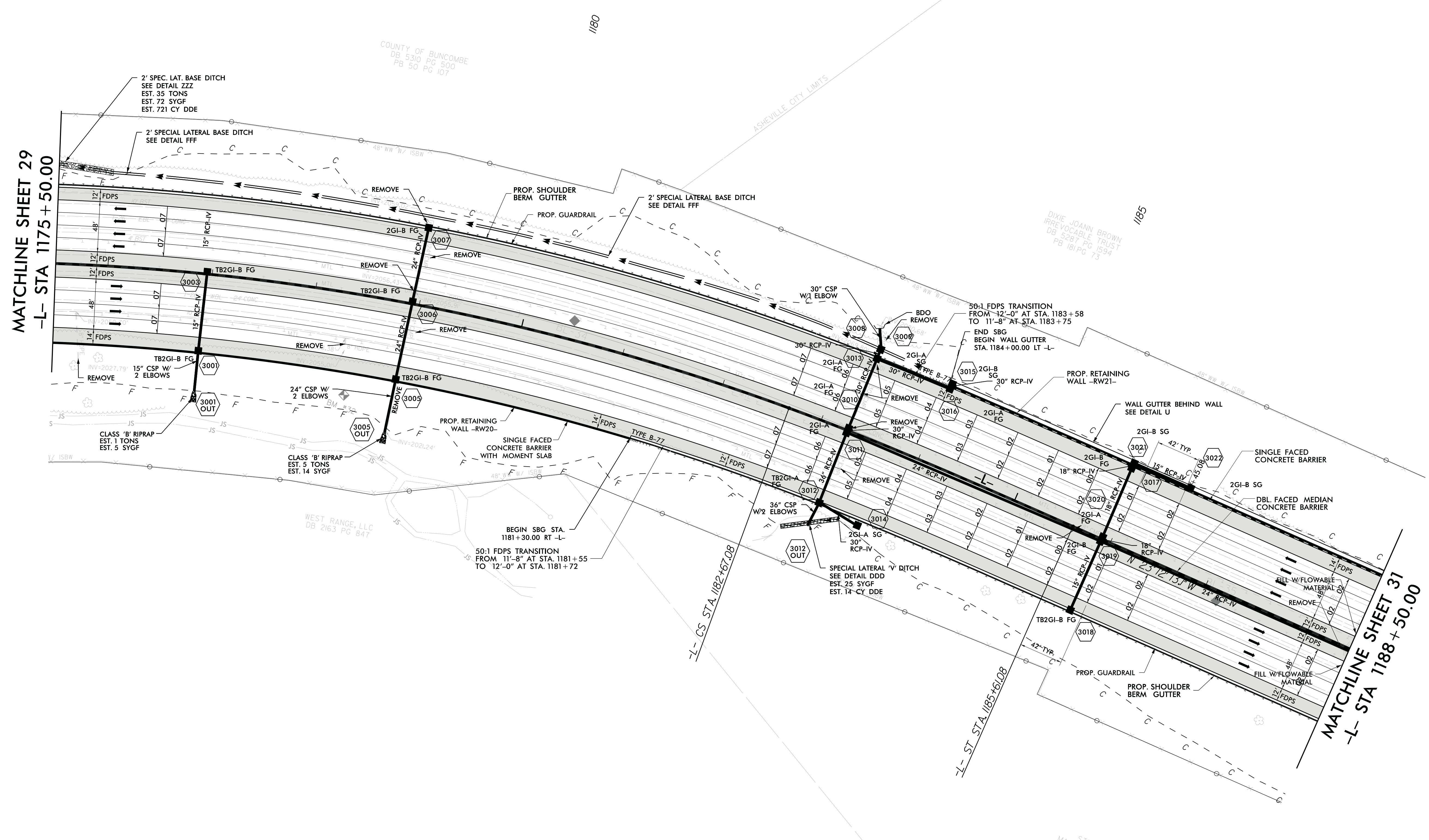
REVISIONS

7/19/2017



MATCHLINE SHEET 29
-L- STA 1175+50.00
MATCHLINE SHEET 31
-L- STA 1188+50.00
2' SPEC. LAT. BASE DITCH
SEE DETAIL ZZZ
EST. 35 TONS
EST. 72 SYGF
EST. 721 CY DDE
2' SPECIAL LATERAL BASE DITCH
SEE DETAIL FFF
PROP. SHOULDER BERM GUTTER
PROP. GUARDRAIL
COUNTY OF BUNCOMBE
DB 5310 PG 500
PB 50 PG 107
ASHEVILLE CITY LIMITS
DIXIE JOANN BROWN
IRREVOCABLE TRUST
DB 5267 PG 1594
PB 181 PG 73
WEST RANGE, LLC
DB 2163 PG 847
30" CSP W/1 ELBOW
BDO REMOVE
50:1 FDPS TRANSITION
FROM 12'-0" AT STA. 1183+58
TO 11'-8" AT STA. 1183+75
END SBG
BEGIN WALL GUTTER
STA. 1184+00.00 LT -L-
PROP. RETAINING WALL -RW21-
WALL GUTTER BEHIND WALL
SEE DETAIL U
SINGLE FACED CONCRETE BARRIER
DBL. FACED MEDIAN CONCRETE BARRIER
FILL W/FLOWABLE MATERIAL
15" CSP W/ 2 ELBOWS
CLASS 'B' RIPRAP
EST. 1 TONS
EST. 5 SYGF
24" CSP W/ 2 ELBOWS
CLASS 'B' RIPRAP
EST. 5 TONS
EST. 14 SYGF
PROP. RETAINING WALL -RW20-
SINGLE FACED CONCRETE BARRIER WITH MOMENT SLAB
BEGIN SBG STA. 1181+30.00 RT -L-
50:1 FDPS TRANSITION
FROM 11'-8" AT STA. 1181+55
TO 12'-0" AT STA. 1181+72
36" CSP W/2 ELBOWS
SPECIAL LATERAL 'V' DITCH
SEE DETAIL DDD
EST. 25 SYGF
EST. 14 CY DDE
-L- CS STA. 1182+67.08
-L- ST STA. 1185+61.08
N 23°12'13" W
STEVE A. & MARLENE V. BALDWIN
DB 4426 PG

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

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PROJECT REFERENCE NO.	SHEET NO.
I-4700	31
R/W SHEET NO.	I-4700B-41
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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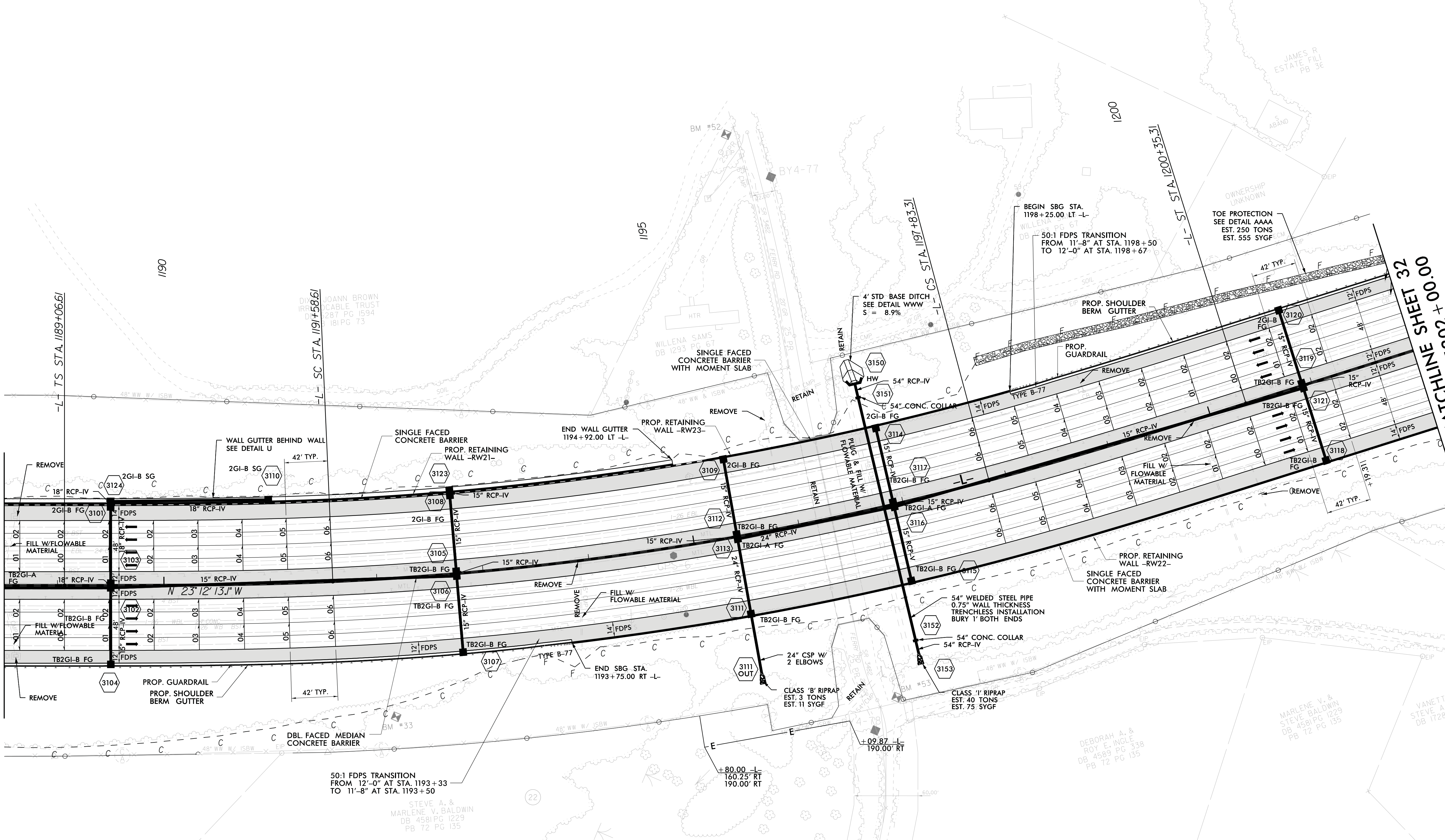
NAD 83

REVISIONS

7/19/2017



MATCHLINE SHEET 30
-L- STA 1188+50.00
MATCHLINE SHEET 32
-L- STA 1202+00.00
-L- TS STA 1189+06.61
-L- SC STA 1191+58.61
-L- CS STA 1197+83.31
-L- ST STA 1200+35.31
N 23° 12' 13.1" W
WALL GUTTER BEHIND WALL SEE DETAIL U
SINGLE FACED CONCRETE BARRIER
PROP. RETAINING WALL -RW21-
END WALL GUTTER 1194+92.00 LT -L-
PROP. RETAINING WALL -RW23-
SINGLE FACED CONCRETE BARRIER WITH MOMENT SLAB
4' STD BASE DITCH SEE DETAIL WWW S = 8.9%
BEGIN SBG STA. 1198+25.00 LT -L-
50:1 FDPS TRANSITION FROM 11'-8" AT STA. 1198+50 TO 12'-0" AT STA. 1198+67
TOE PROTECTION SEE DETAIL AAAA EST. 250 TONS EST. 555 SYGF
PROP. SHOULDER BERM GUTTER
PROP. GUARDRAIL
FILL W/FLOWABLE MATERIAL
PLUG & FILL W/ FLOWABLE MATERIAL
54" WELDED STEEL PIPE 0.75" WALL THICKNESS TRENCHLESS INSTALLATION BURY 1' BOTH ENDS
54" CONC. COLLAR
CLASS 'I' RIPRAP EST. 40 TONS EST. 75 SYGF
CLASS 'B' RIPRAP EST. 3 TONS EST. 11 SYGF
24" CSP W/ 2 ELBOWS
END SBG STA. 1193+75.00 RT -L-
DBL. FACED MEDIAN CONCRETE BARRIER
50:1 FDPS TRANSITION FROM 12'-0" AT STA. 1193+33 TO 11'-8" AT STA. 1193+50
PROP. RETAINING WALL -RW22-
REMOVE
RETAIN
42' TYP.

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

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PROJECT REFERENCE NO.	SHEET NO.
I-4700	32
R/W SHEET NO.	I-4700B-42
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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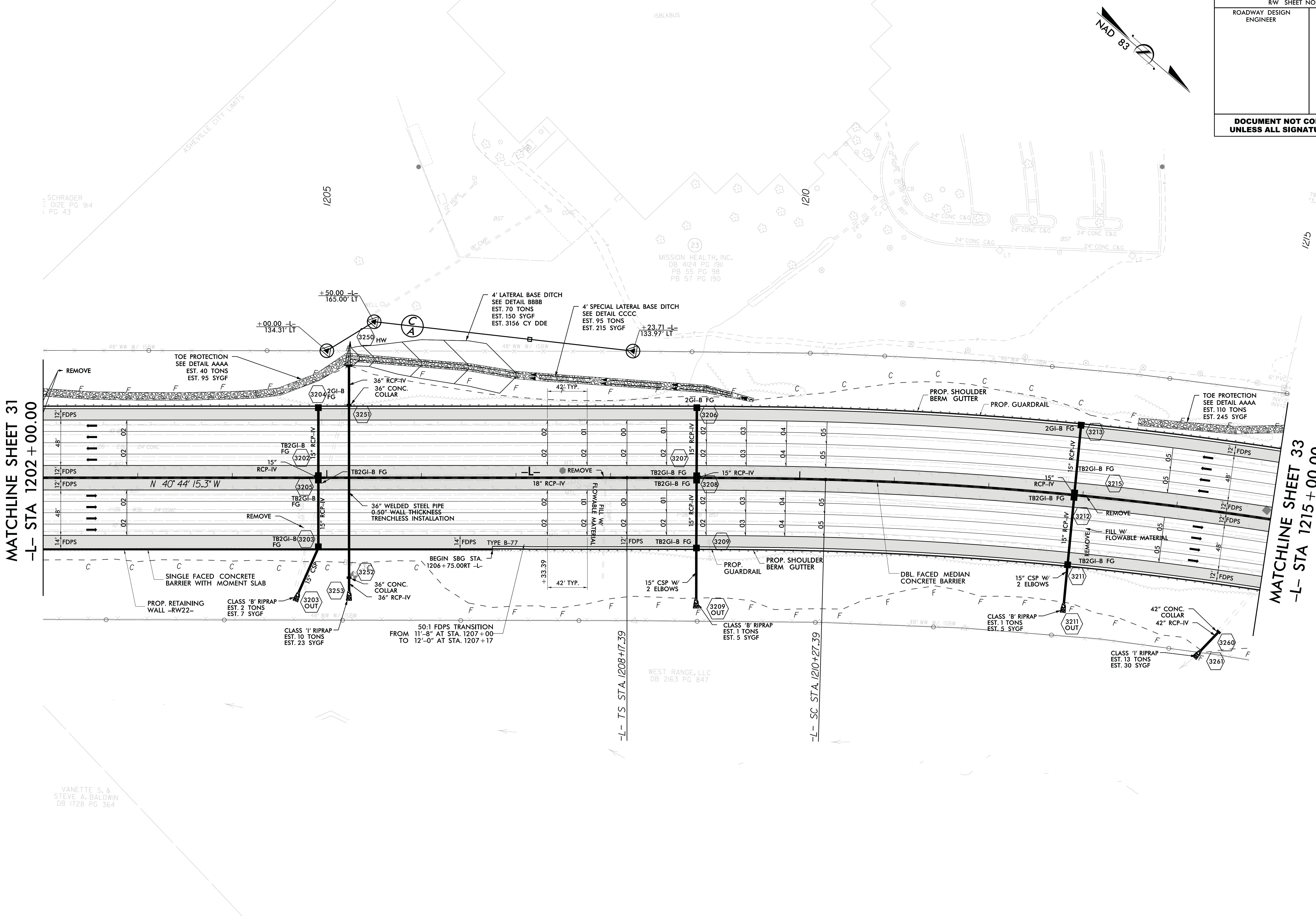

NAD 83
MATCHLINE SHEET 31
-L- STA 1202+00.00
MATCHLINE SHEET 33
-L- STA 1215+00.00
1205
1210
1215
ASHEVILLE CITY LIMITS
SCHRADER
MISSION HEALTH, INC.
DB 4124 PG 191
PB 55 PG 98
PB 57 PG 190
WEST RANGE, LLC
DB 2163 PG 847
VANETTE S. &
STEVE A. BALDWIN
DB 1728 PG 364
+50.00 -L-
165.00' LT
+00.00 -L-
134.31' LT
+23.71 -L-
133.97' LT
4' LATERAL BASE DITCH
SEE DETAIL BBBB
EST. 70 TONS
EST. 150 SYGF
EST. 3156 CY DDE
4' SPECIAL LATERAL BASE DITCH
SEE DETAIL CCCC
EST. 95 TONS
EST. 215 SYGF
TOE PROTECTION
SEE DETAIL AAAA
EST. 40 TONS
EST. 95 SYGF
REMOVE
36" RCP-IV
36" CONC. COLLAR
42' TYP.
2GI-B FG
PROP. SHOULDER BERM GUTTER
PROP. GUARDRAIL
TOE PROTECTION
SEE DETAIL AAAA
EST. 110 TONS
EST. 245 SYGF
FDPS
TB2GI-B FG
15" RCP-IV
N 40° 44' 15.3" W
-L-
18" RCP-IV
FILL W/ FLOWABLE MATERIAL
36" WELDED STEEL PIPE
0.50" WALL THICKNESS
TRENCHLESS INSTALLATION
TYPE B-77
BEGIN SBG STA.
1206+75.00RT -L-
SINGLE FACED CONCRETE
BARRIER WITH MOMENT SLAB
PROP. RETAINING WALL -RW22-
CLASS 'B' RIPRAP
EST. 2 TONS
EST. 7 SYGF
CLASS 'I' RIPRAP
EST. 10 TONS
EST. 23 SYGF
50:1 FDPS TRANSITION
FROM 11'-8" AT STA. 1207+00
TO 12'-0" AT STA. 1207+17
15" CSP W/ 2 ELBOWS
CLASS 'B' RIPRAP
EST. 1 TONS
EST. 5 SYGF
DBL. FACED MEDIAN CONCRETE BARRIER
CLASS 'B' RIPRAP
EST. 1 TONS
EST. 5 SYGF
42" CONC. COLLAR
42" RCP-IV
CLASS 'I' RIPRAP
EST. 13 TONS
EST. 30 SYGF
-L- TS STA. 1208+17.39
-L- SC STA. 1210+27.39

REVISIONS

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

7/19/2017
28-NOV-2018 10:01
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PROJECT REFERENCE NO.	SHEET NO.
I-4700	33
R/W SHEET NO.	I-4700B-43

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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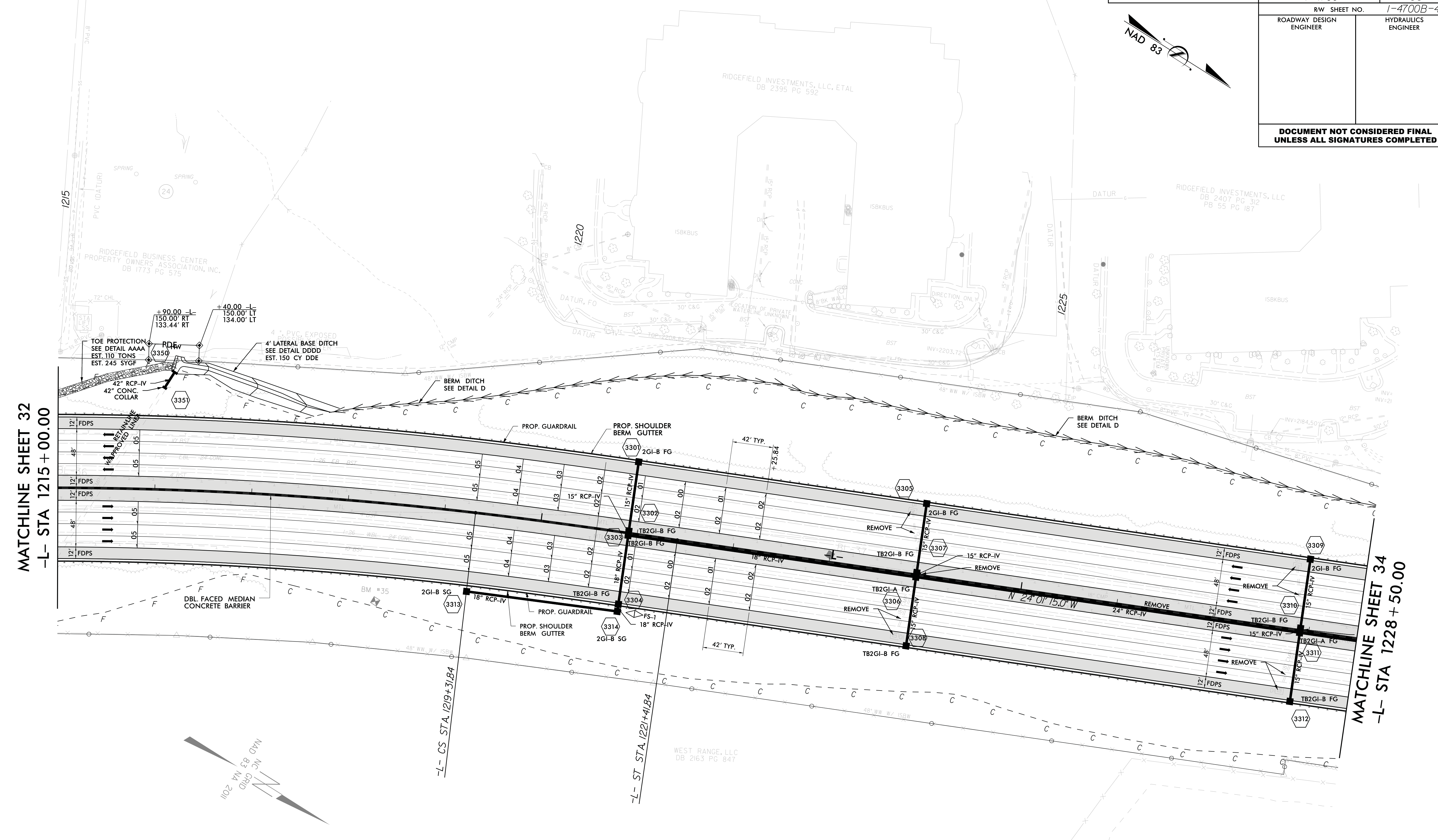

NAD 83
MATCHLINE SHEET 32
-L- STA 1215+00.00
MATCHLINE SHEET 34
-L- STA 1228+50.00
RIDGEFIELD INVESTMENTS, LLC, ETAL
DB 2395 PG 592
RIDGEFIELD INVESTMENTS, LLC
DB 2407 PG 312
PB 55 PG 187
RIDGEFIELD BUSINESS CENTER
PROPERTY OWNERS ASSOCIATION, INC.
DB 1773 PG 575
WEST RANGE, LLC
DB 2163 PG 847
TOE PROTECTION
SEE DETAIL AAAA
EST. 110 TONS
EST. 245 SYGF
+90.00 -L-
150.00' RT
133.44' RT
+40.00 -L-
150.00' LT
134.00' LT
4' LATERAL BASE DITCH
SEE DETAIL DDDD
EST. 150 CY DDE
42" RCP-IV
42" CONC. COLLAR
BERM DITCH
SEE DETAIL D
PROP. GUARDRAIL
PROP. SHOULDER
BERM GUTTER
DBL. FACED MEDIAN
CONCRETE BARRIER
N 24°01'15.0" W
-L- CS STA. 1219+31.84
-L- ST STA. 1221+41.84
42' TYP.
REMOVE
FDPS
2GI-B FG
TB2GI-B FG
TB2GI-A FG
2GI-B SG
15" RCP-IV
18" RCP-IV
24" RCP-IV
FS-1
BM #35
NAD 83
NC GRID
NA 2011

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

PROJECT REFERENCE NO.	SHEET NO.
I-4700	34
R/W SHEET NO.	I-4700B-44
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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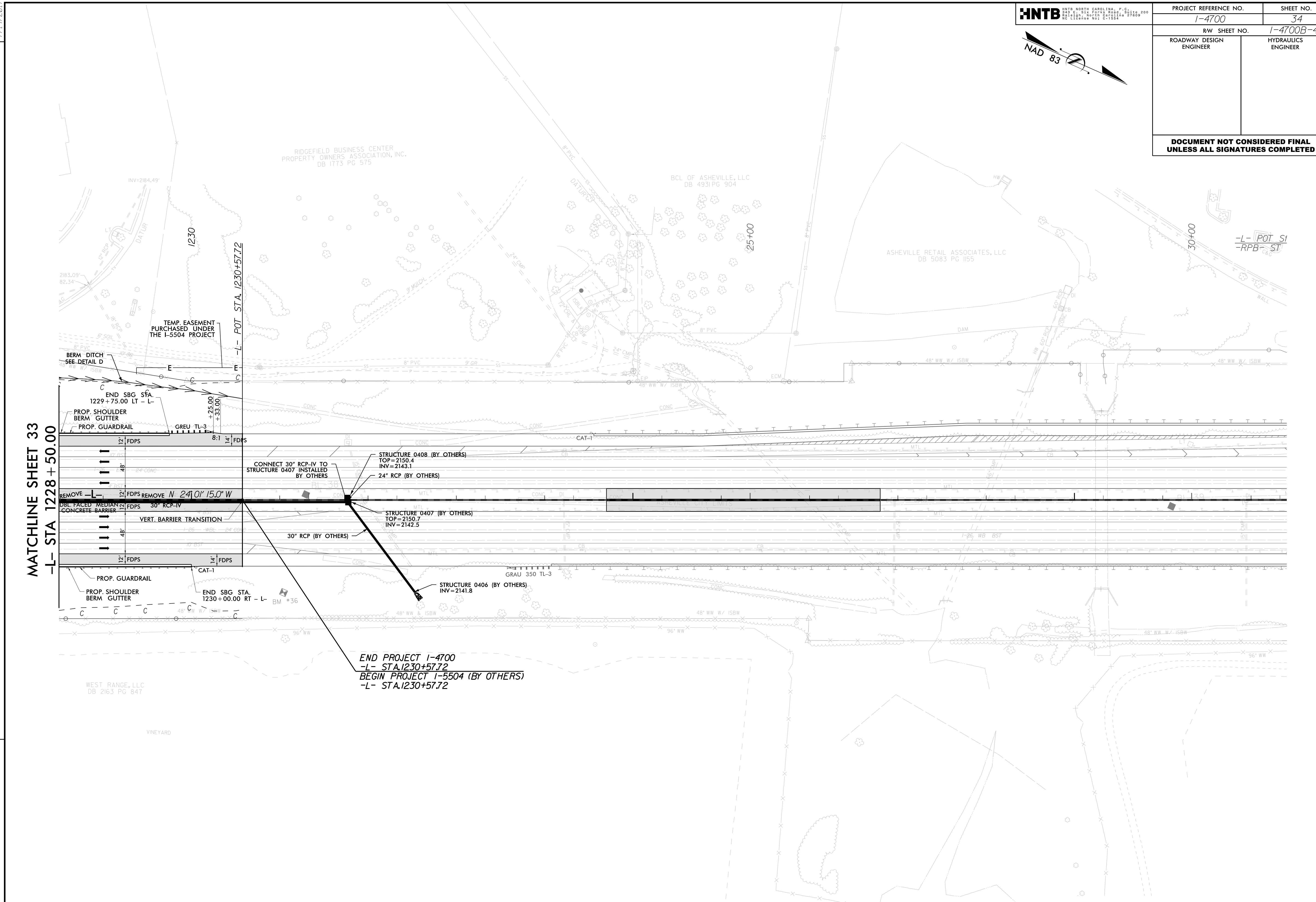

NAD 83
MATCHLINE SHEET 33
-L- STA 1228+50.00
RIDGEFIELD BUSINESS CENTER PROPERTY OWNERS ASSOCIATION, INC. DB 1773 PG 575
BCL OF ASHEVILLE, LLC DB 4931 PG 904
ASHEVILLE RETAIL ASSOCIATES, LLC DB 5083 PG 1155
WEST RANGE, LLC DB 2163 PG 847
TEMP. EASEMENT PURCHASED UNDER THE I-5504 PROJECT
-L- POT STA. 1230+57.72
BERM DITCH SEE DETAIL D
END SBG STA. 1229+75.00 LT - L-
PROP. SHOULDER BERM GUTTER
PROP. GUARDRAIL
GREU TL-3
CAT-1
REMOVE -L-
N 24°01' 15.0" W
DBL. FACED MEDIAN CONCRETE BARRIER
30" RCP-IV
VERT. BARRIER TRANSITION
CONNECT 30" RCP-IV TO STRUCTURE 0407 INSTALLED BY OTHERS
STRUCTURE 0408 (BY OTHERS) TOP=2150.4 INV=2143.1
24" RCP (BY OTHERS)
STRUCTURE 0407 (BY OTHERS) TOP=2150.7 INV=2142.5
30" RCP (BY OTHERS)
STRUCTURE 0406 (BY OTHERS) INV=2141.8
GRAU 350 TL-3
END SBG STA. 1230+00.00 RT - L-
BM #36
END PROJECT I-4700
-L- STA.1230+57.72
BEGIN PROJECT I-5504 (BY OTHERS)
-L- STA.1230+57.72
ASHEVILLE CITY LIMITS
-L- POT STA
-RPB- STA

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

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PROJECT REFERENCE NO.	SHEET NO.
I-4700	35
R/W SHEET NO.	I-4700B-45
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

8/17/99

NAD 83
MATCHLINE SHEET 17
-Y15- STA 55+00.00
S 79° 16' 09.0" E
-Y15- PCC STA 55+50.05
BEGIN MILL AND OVERLAY LT STA 55+40.60 -Y15-
PROP. 2'-6" CURB AND GUTTER
115' EOP TAPER RT
SAWCUT
STA. 59+01.43 END MONOLITHIC MEDIAN
END MILL AND OVERLAY LT. & RT. STA 59+25.00 -Y15-
POT STA 12+00.00
N 20°15' 50.3" E
-Y15E-
SCHENCK PKWY.
-Y15- POC 59+80.42 =
-Y15E- POT 10+00.00
RETAIN
-Y15-
PROP. 5' SIDEWALK
ADJUST GAS VALVE
ADJUST WATER VALVE
+00.00 -Y15- 60.00' LT 58.21' LT
+70.00 -Y15- 60.00' LT
+30.00 -Y15- 110.00' LT 70.00' LT
-Y15- STA 62+36.97 MATCH EXIST. JOINT
PROP. 1'-6" CURB AND GUTTER
100' EOP TAPER LT
-Y15- STA 64+06.78 MATCH EXIST. JOINT
-Y15F- POT STA 10+91.54
REMOVE AND RESET BENCHMARK
+50.00 -Y15- 110.00' LT 53.79' LT
END CONSTRUCTION -Y15- POT STA. 65+43.45
15" RCP-IV
CONVERT EX CB TO JB W/MH
-Y15F-
BEGIN MILL AND OVERLAY LT & RT. STA 62+10.87 -Y15-
-Y15- PT STA 62+20.28
-Y15- POC 64+97.43 =
-Y15F- POT 10+00.00
END MILL AND OVERLAY LT. & RT. STA 65+43.45 -Y15-
LONG SHOALS ROAD S 63° 07' 38.5" E
-Y15RPC- PT STA 25+80.30
-Y15RPC- POT STA 25+88.92
MISSION HOSPITAL, INC. DB 5135 PG 306
FLETCHER HOSPITAL, INC. DB 4880 PG 1287 PB 58 PG 31
SOUTHEAST ENERGY, LLC DB 5504 PG 1995
WAFFLE HOUSE, INC. DB 1818 PG 245
CARL H. RICKER, JR. DB 1512 PG 10
BHAGWANJIN, PATEL DB 4512 PG 1109
HICKLIN HILL, LLC DB 4743 PG 1390

★	PROPOSED TRAFFIC SIGNAL
☆	EXISTING TRAFFIC SIGNAL

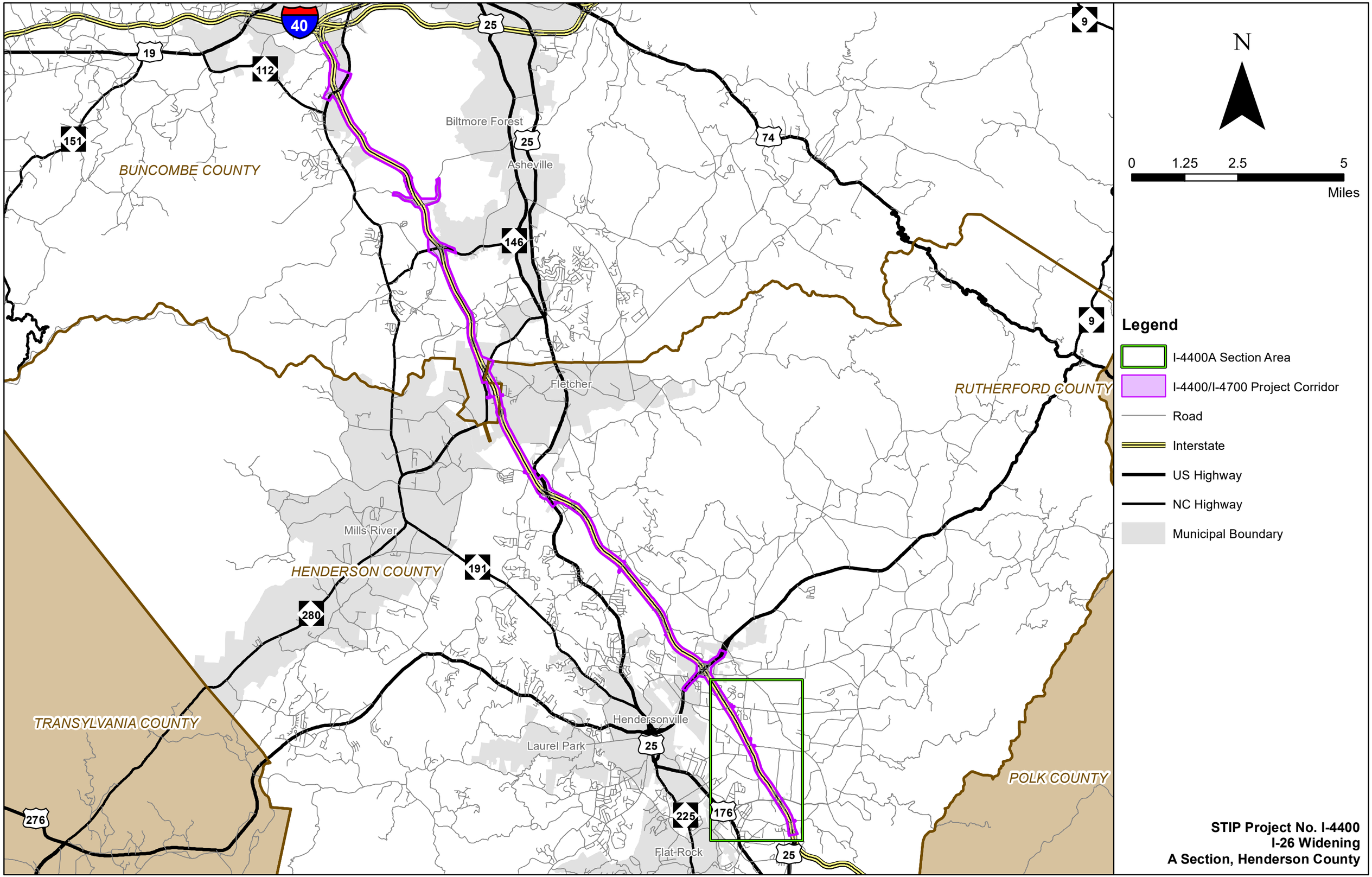
FOR -Y15F- PROFILE, SEE SHEET 68
SEE SHEET 2B-8 FOR DETAILS

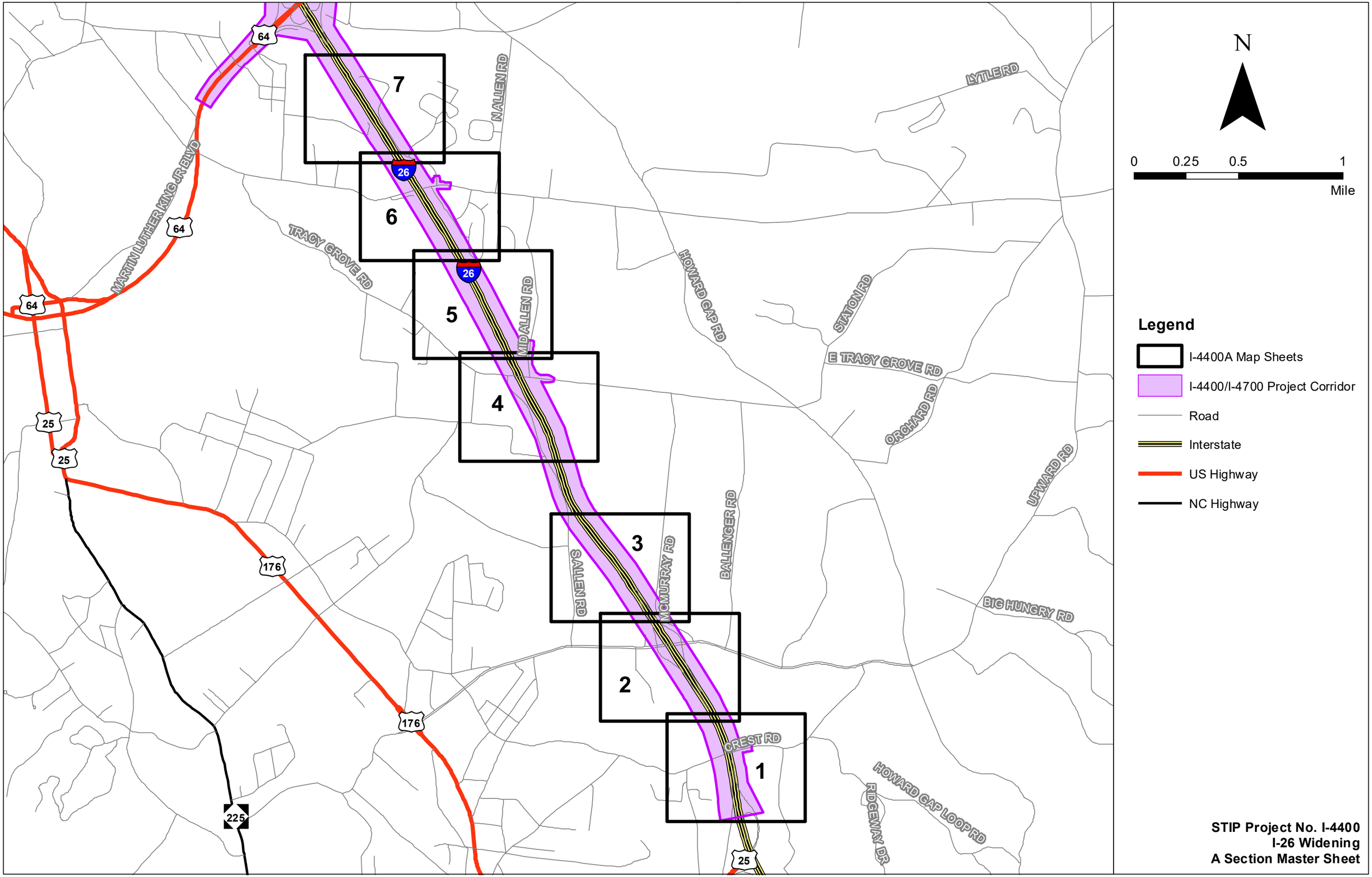
28-NOV-2018 10:01
I4700A_RDY_PSH_35.dgn
HNTB

DRAFT Permit Map Set:

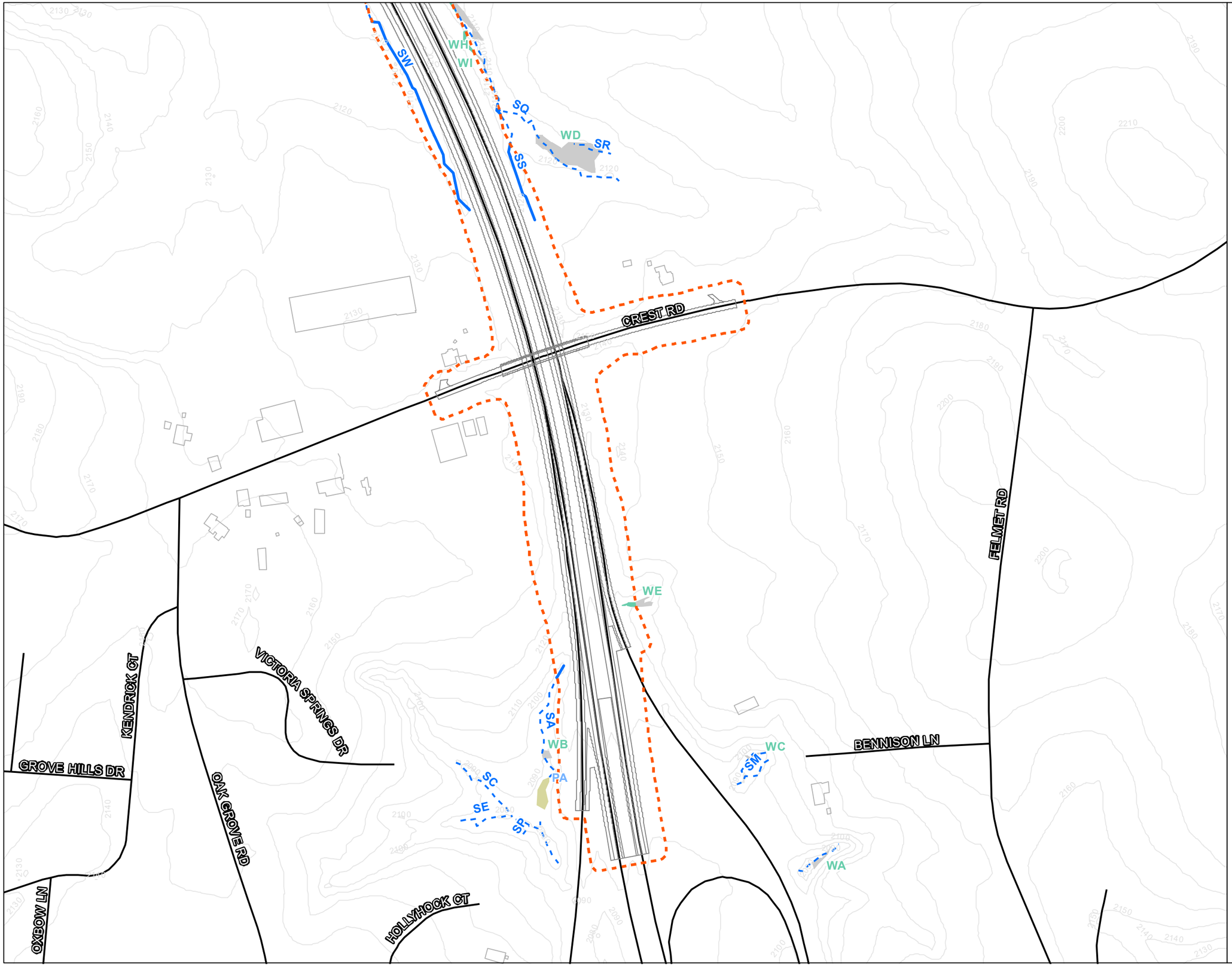
I-4400 USACE PERMIT MAPS: **Sections A, BA, BB, C**

November, 2018


N
0
1.25
2.5
5
Miles
Legend
I-4400A Section Area
I-4400/I-4700 Project Corridor
Road
Interstate
US Highway
NC Highway
Municipal Boundary
STIP Project No. I-4400
I-26 Widening
A Section, Henderson County
BUNCOMBE COUNTY
HENDERSON COUNTY
TRANSYLVANIA COUNTY
RUTHERFORD COUNTY
POLK COUNTY
Biltmore Forest
Asheville
Fletcher
Mills River
Hendersonville
Laurel Park
Flat Rock
40
25
19
112
151
146
74
9
191
280
225
176
276



STIP Project No. I-4400
I-26 Widening
A Section Master Sheet



N

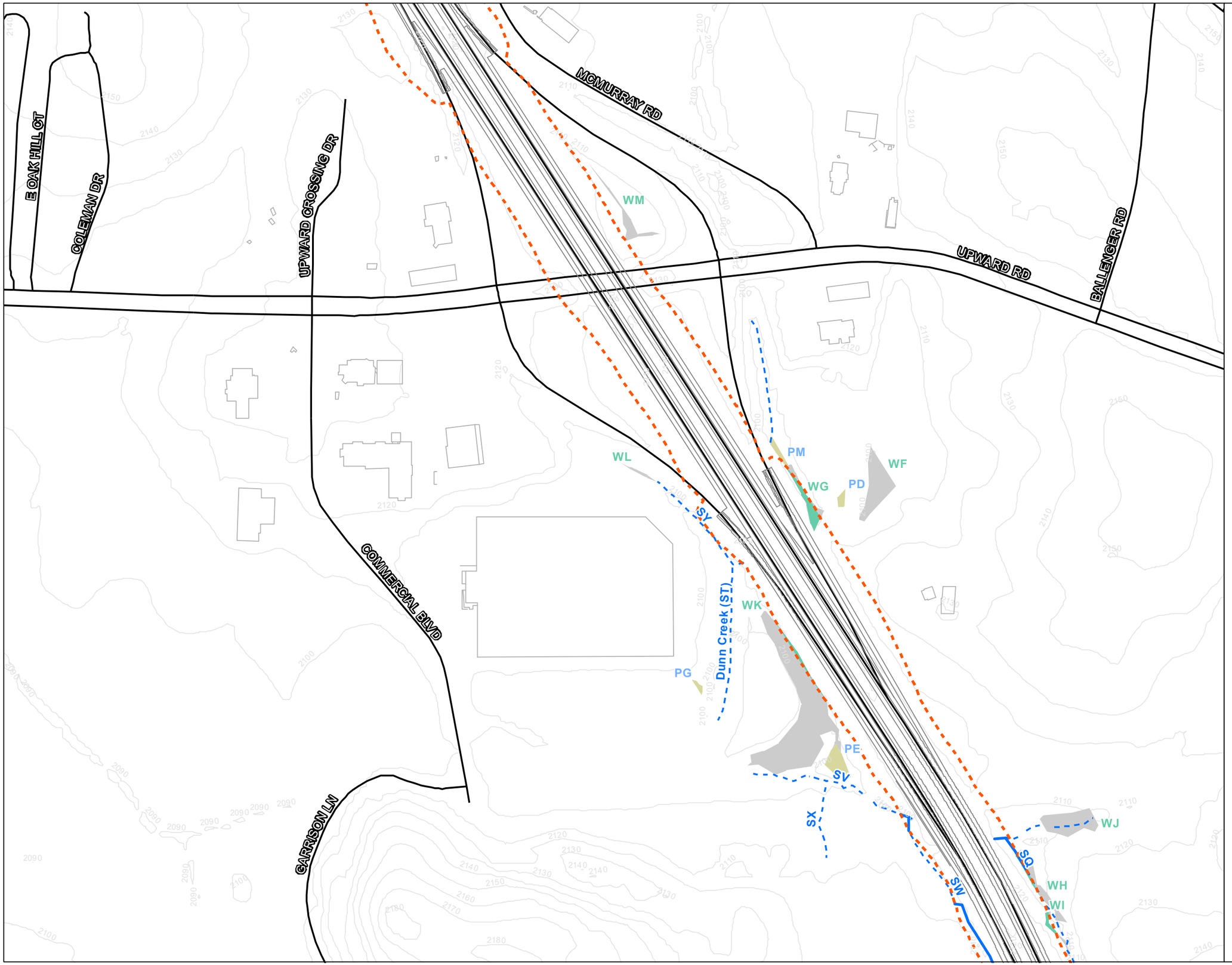
0 125 250 500

Feet

Legend

- I-4400 Slope Stake Limits + 25-foot buffer (SS+25')
- Streams Within SS+25
- Ponds Within SS+25
- Wetlands Within SS+25
- Delineated Streams
- Delineated Ponds
- Delineated Wetlands
- Existing Road

STIP Project No. I-4400
I-26 Widening
A Section: Sheet 1 of 7



STIP Project No. I-4400
I-26 Widening
A Section: Sheet 2 of 7

MERRY OAKS LN

COLLEGE DR

SALLEN RD

EBBY MANOR LN

MCMURRAY RD

E OAK HILL CT

WO

WP

WN

WW

SAH

SAA

SZ

N

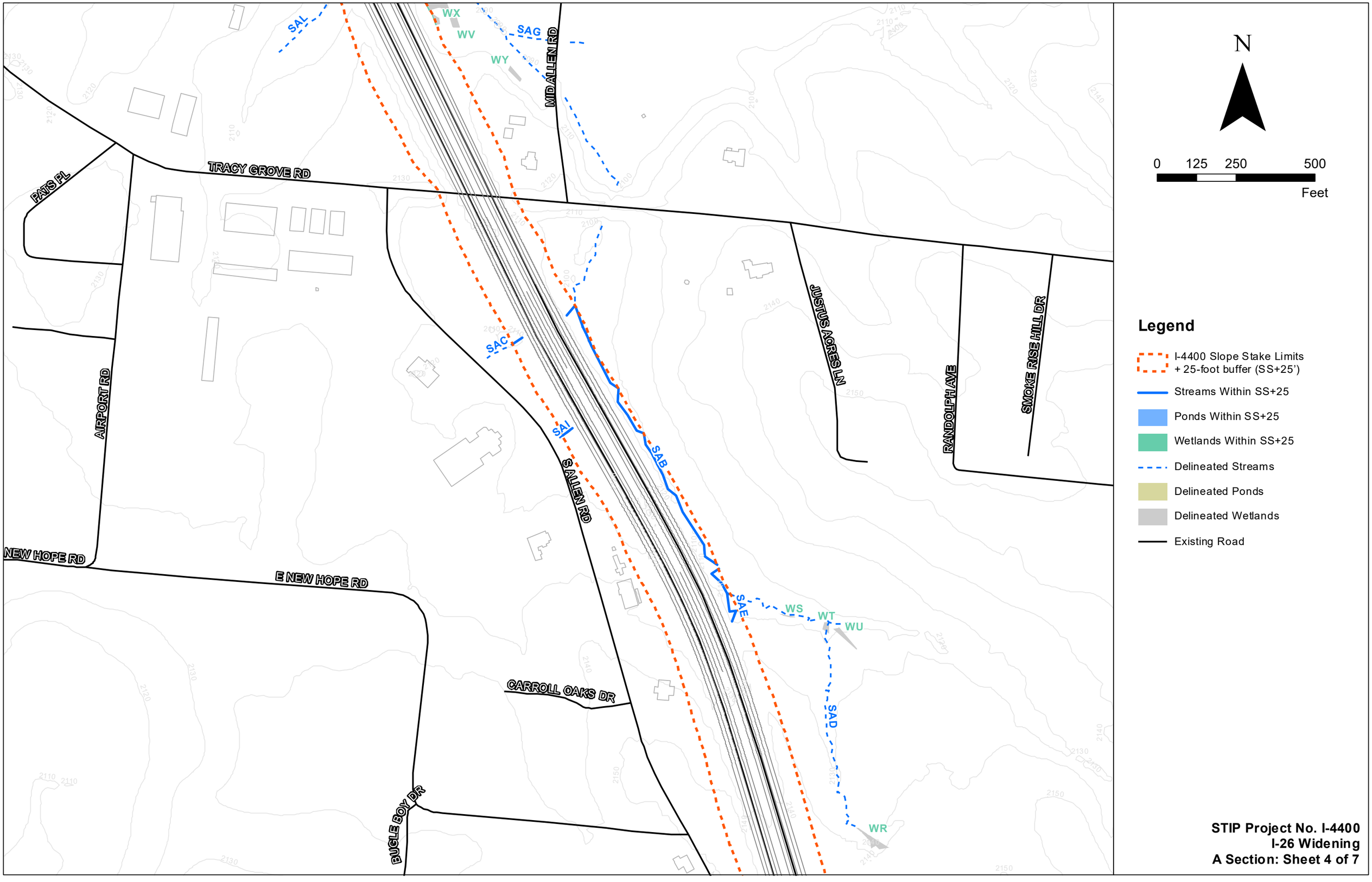
0 125 250 500

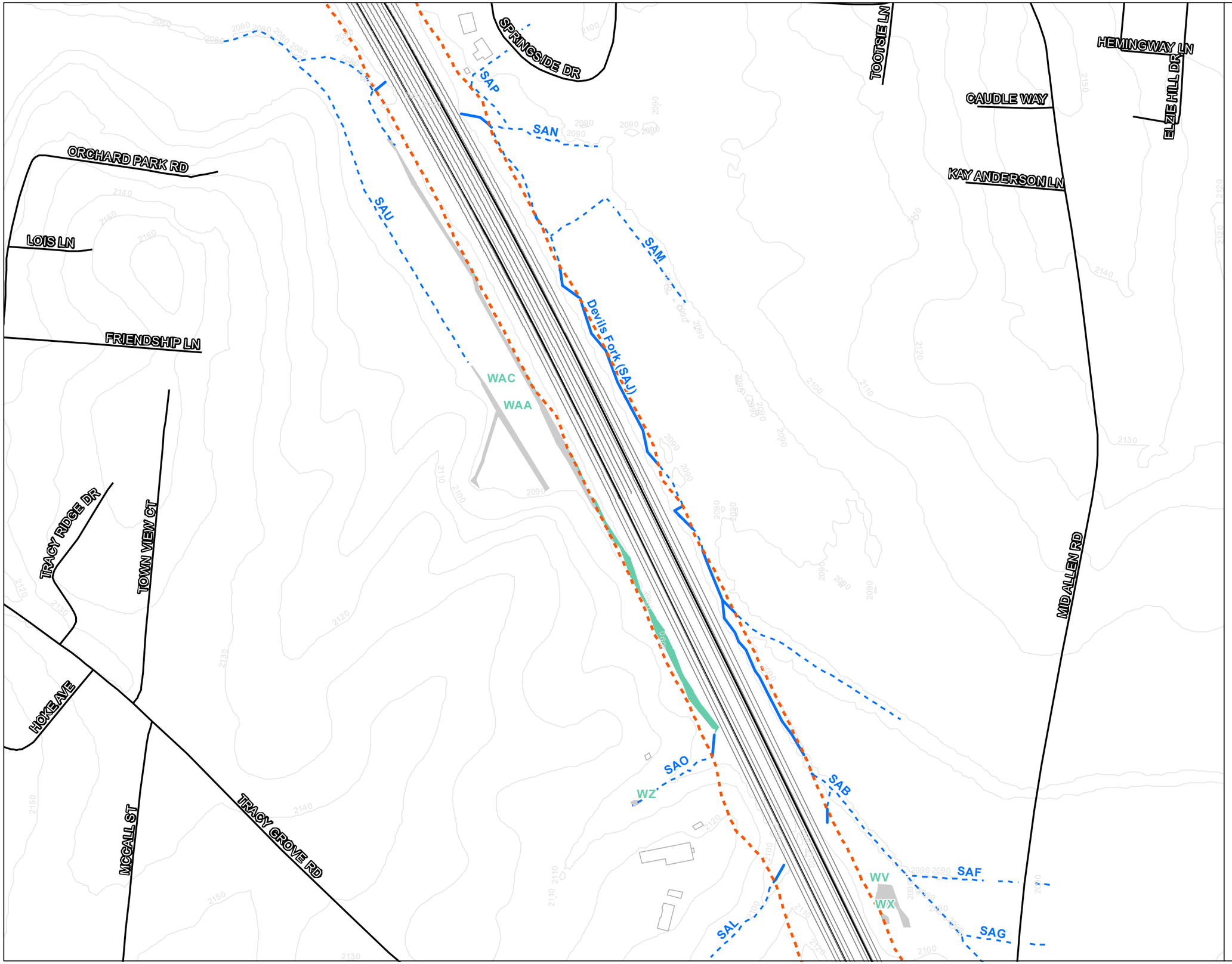
Feet

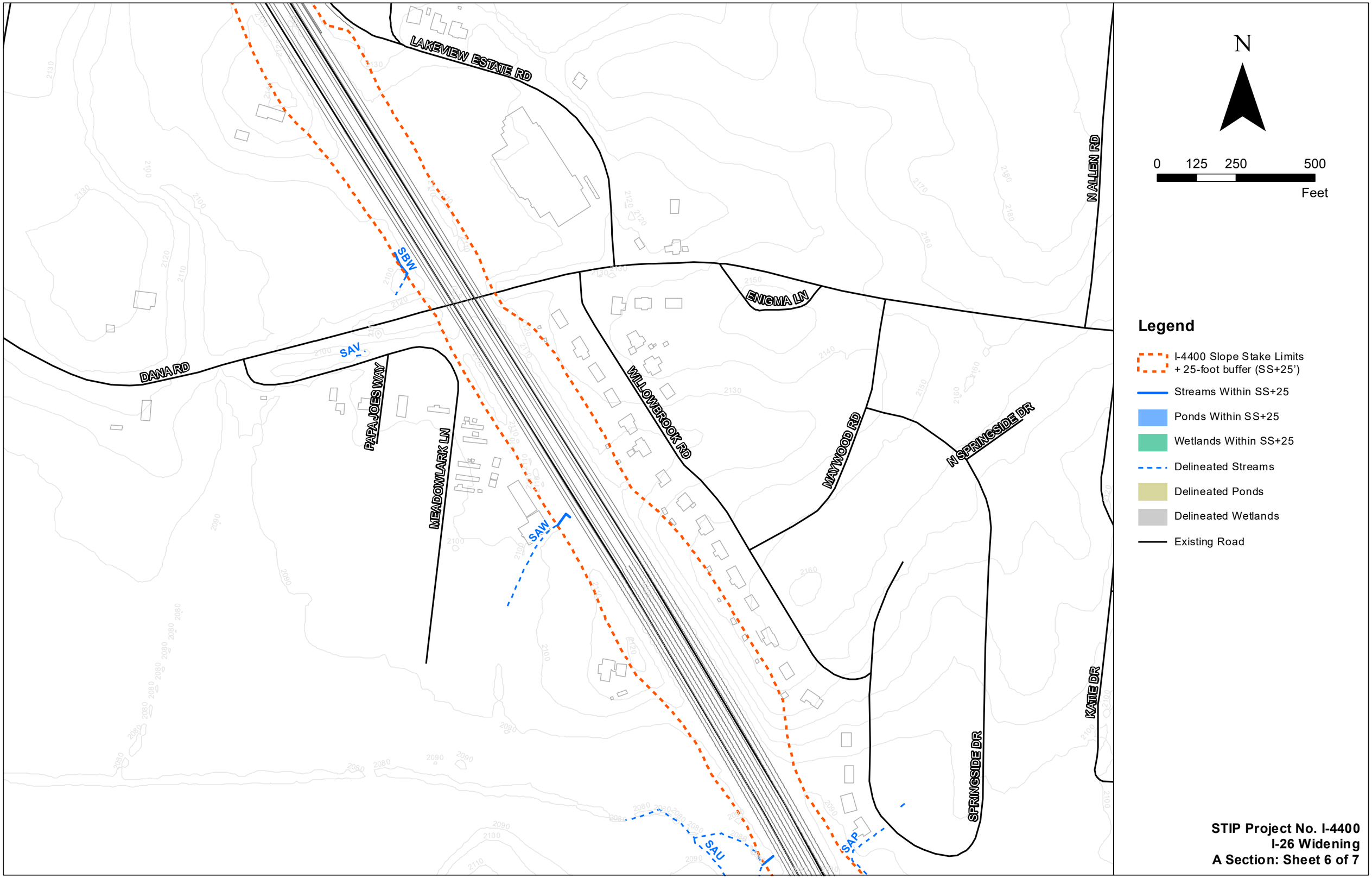
Legend

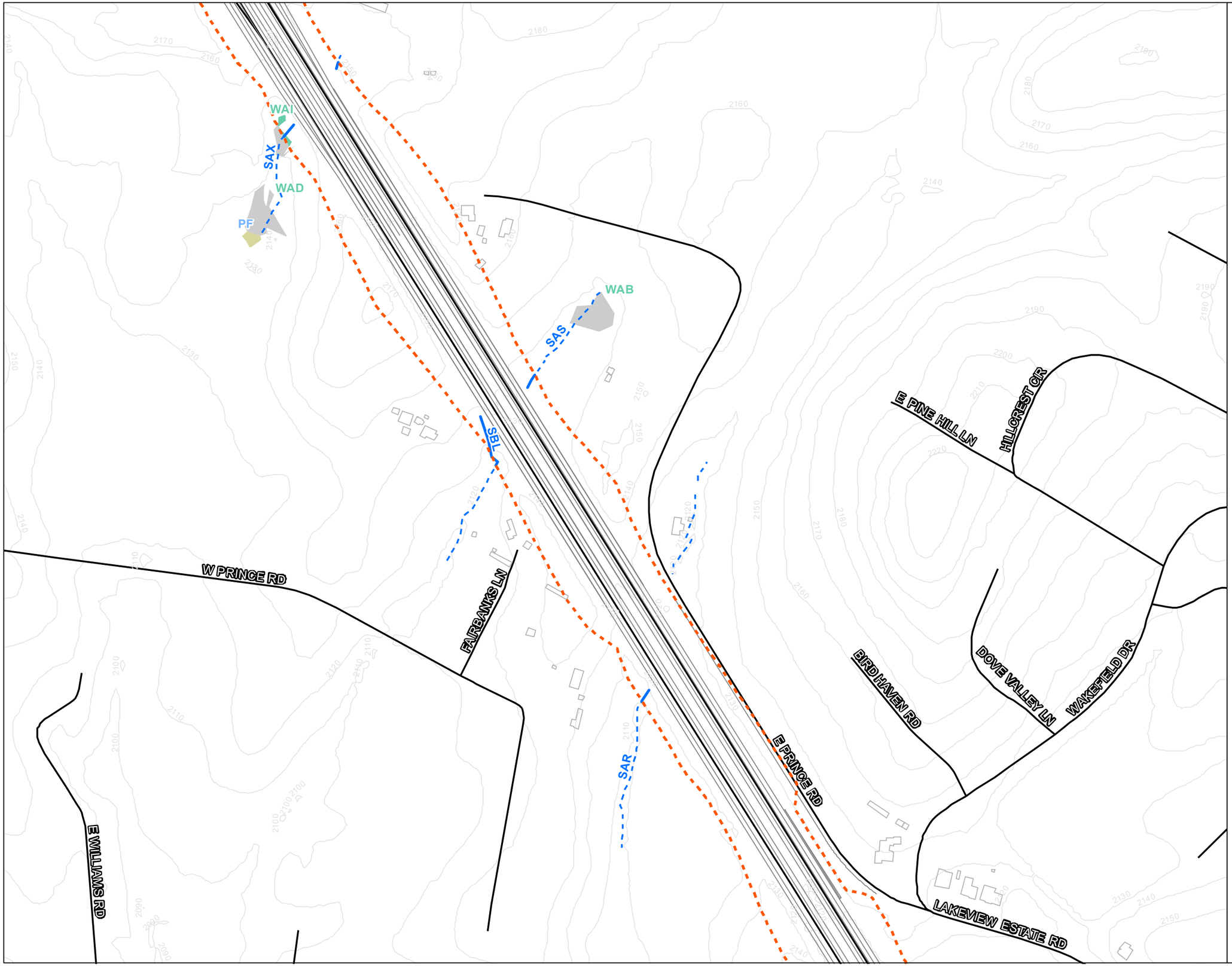
- I-4400 Slope Stake Limits + 25-foot buffer (SS+25')
- Streams Within SS+25
- Ponds Within SS+25
- Wetlands Within SS+25
- Delineated Streams
- Delineated Ponds
- Delineated Wetlands
- Existing Road

STIP Project No. I-4400
I-26 Widening
A Section: Sheet 3 of 7


N
0 125 250 500
Feet
Legend
I-4400 Slope Stake Limits + 25-foot buffer (SS+25')
Streams Within SS+25
Ponds Within SS+25
Wetlands Within SS+25
Delineated Streams
Delineated Ponds
Delineated Wetlands
Existing Road
STIP Project No. I-4400
I-26 Widening
A Section: Sheet 4 of 7
TRACY GROVE RD
PATS PL
AIRPORT RD
NEW HOPE RD
E NEW HOPE RD
MID ALLEN RD
SALLEN RD
CARROLL OAKS DR
BUGLE BOY DR
JUSTUS ACRES LN
RANDOLPH AVE
SMOKE RISE HILL DR
SAL
SAG
SAC
SAI
SAB
SAE
SAD
WX
WV
WY
WS
WT
WU
WR


SPRINGSIDE DR
TOOTSIE LN
HEMINGWAY LN
ELZIE HILL DR
CAUDLE WAY
KAY ANDERSON LN
ORCHARD PARK RD
LOIS LN
FRIENDSHIP LN
SAP
SAN
SAU
SAM
Devils Fork (SAJ)
WAC
WAA
TRACY RIDGE DR
TOWN VIEW CT
HOKE AVE
MCCALL ST
TRACY GROVE RD
MID ALLEN RD
SAO
WZ
SAB
SAF
WV
WX
SAL
SAG
N
0 125 250 500
Feet
Legend
I-4400 Slope Stake Limits + 25-foot buffer (SS+25')
Streams Within SS+25
Ponds Within SS+25
Wetlands Within SS+25
Delineated Streams
Delineated Ponds
Delineated Wetlands
Existing Road
STIP Project No. I-4400
I-26 Widening
A Section: Sheet 5 of 7


LAKEVIEW ESTATE RD
N ALLEN RD
ENIGMA LN
DANA RD
PAPA JOES WAY
MEADOWLARK LN
WILLOWBROOK RD
MAYWOOD RD
N SPRINGSIDE DR
SPRINGSIDE DR
KATIE DR
SBW
SAV
SAW
SAU
SAP
N
0 125 250 500
Feet
Legend
I-4400 Slope Stake Limits + 25-foot buffer (SS+25')
Streams Within SS+25
Ponds Within SS+25
Wetlands Within SS+25
Delineated Streams
Delineated Ponds
Delineated Wetlands
Existing Road
STIP Project No. I-4400
I-26 Widening
A Section: Sheet 6 of 7



N

0 125 250 500

Feet

Legend

- I-4400 Slope Stake Limits + 25-foot buffer (SS+25')
- Streams Within SS+25
- Ponds Within SS+25
- Wetlands Within SS+25
- Delineated Streams
- Delineated Ponds
- Delineated Wetlands
- Existing Road

STIP Project No. I-4400
I-26 Widening
A Section: Sheet 7 of 7

STIP No. I-4400, Section A

Summary Sheet: Impacts within slope stakes + 25'

Note: wetland impacts calculated to nearest 0.01 acre; stream impacts calculate to nearest foot

Wetlands

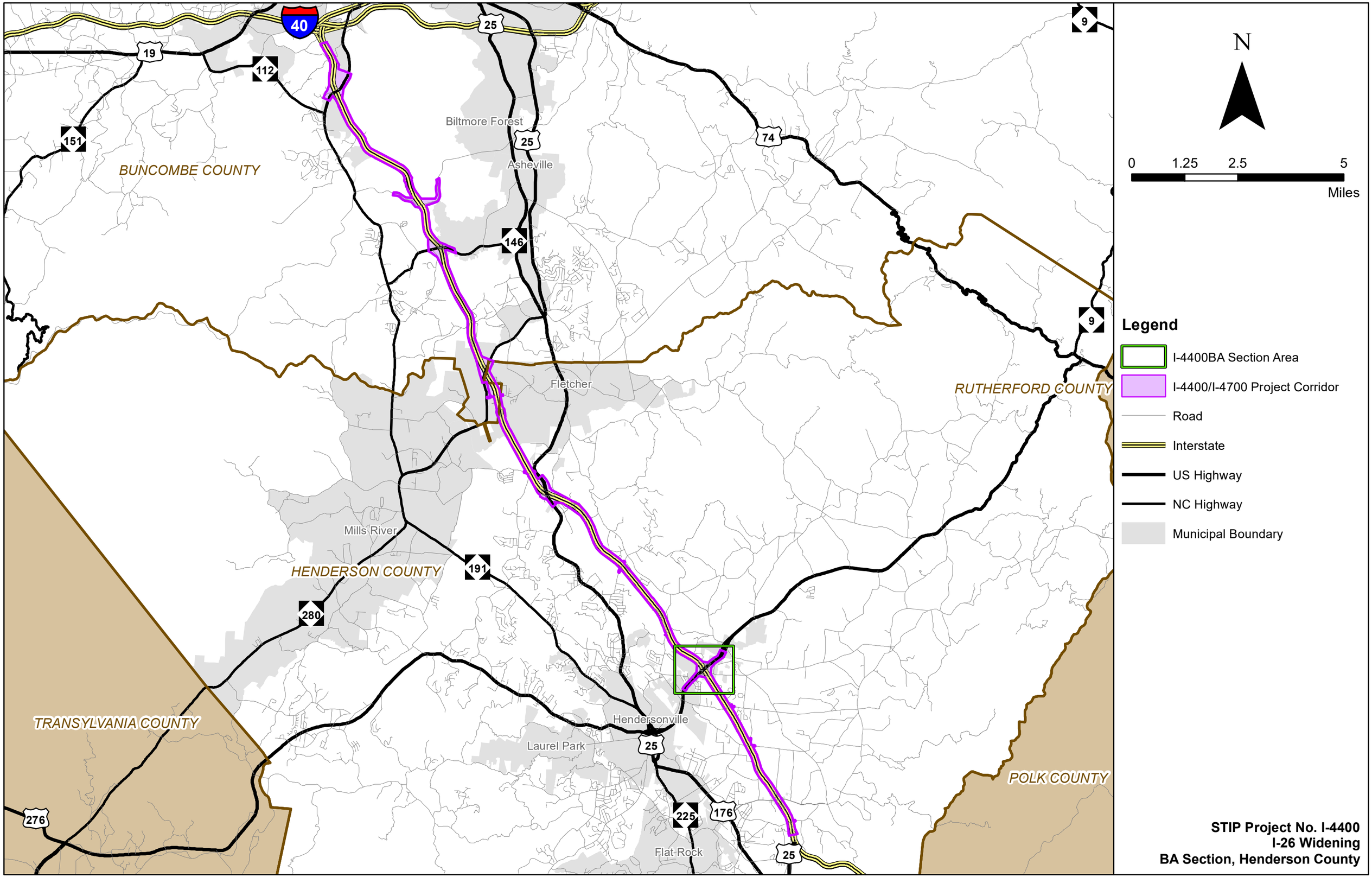
Sheet No.	*Name*	*Area (Acres)*
5	WAA	0.28
7	WAI	0.02
1	WE	0.01
2	WG	0.06
1, 2	WH	0.02
1, 2	WI	0.01
2	WK	0.02
2	WM	<0.01
3	WN	<0.01
3	WO	0.04
4, 5	WV	<0.01
3	WW	0.07
4, 5	WX	<0.01
		Total: 0.54

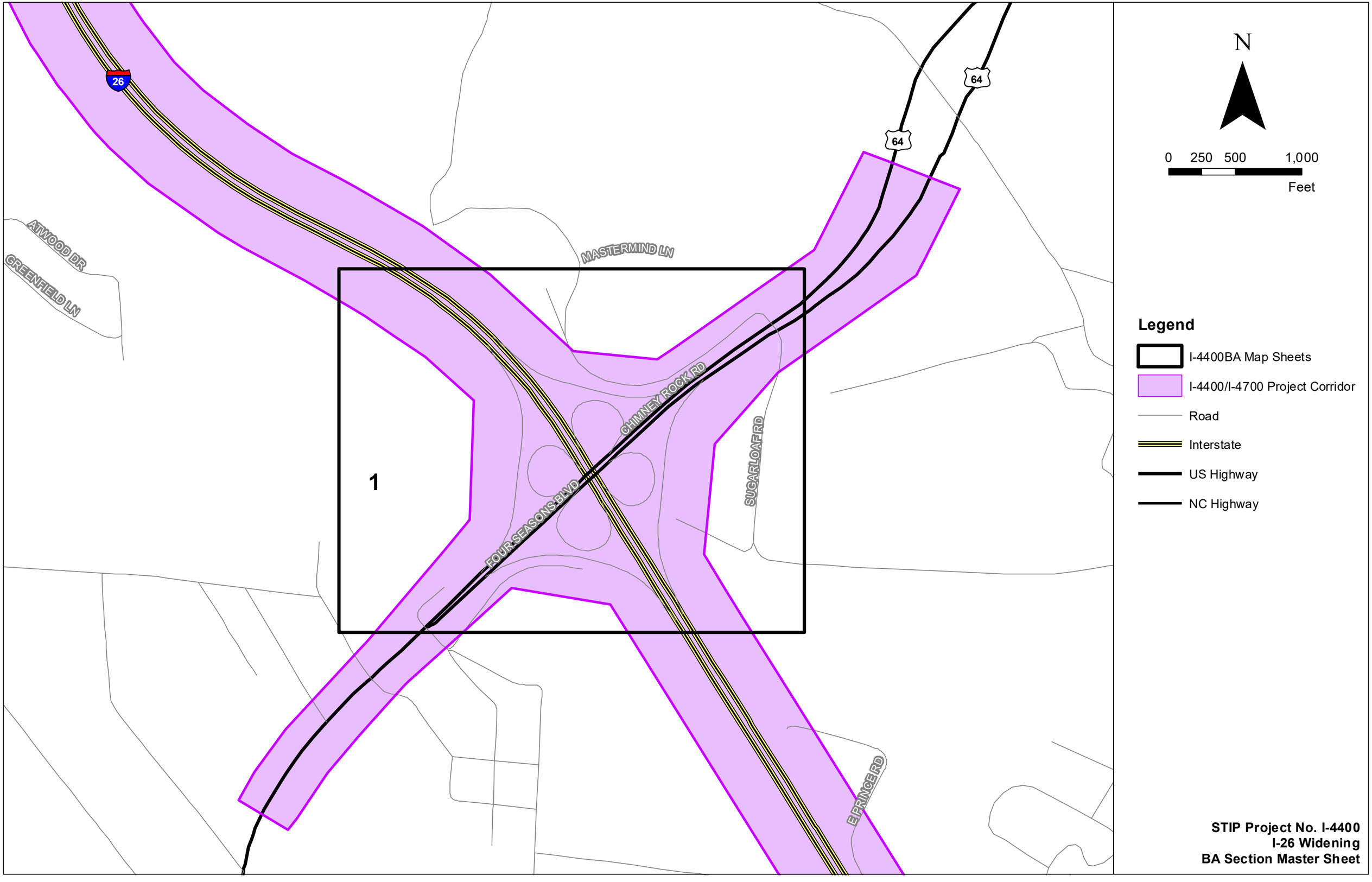
Streams

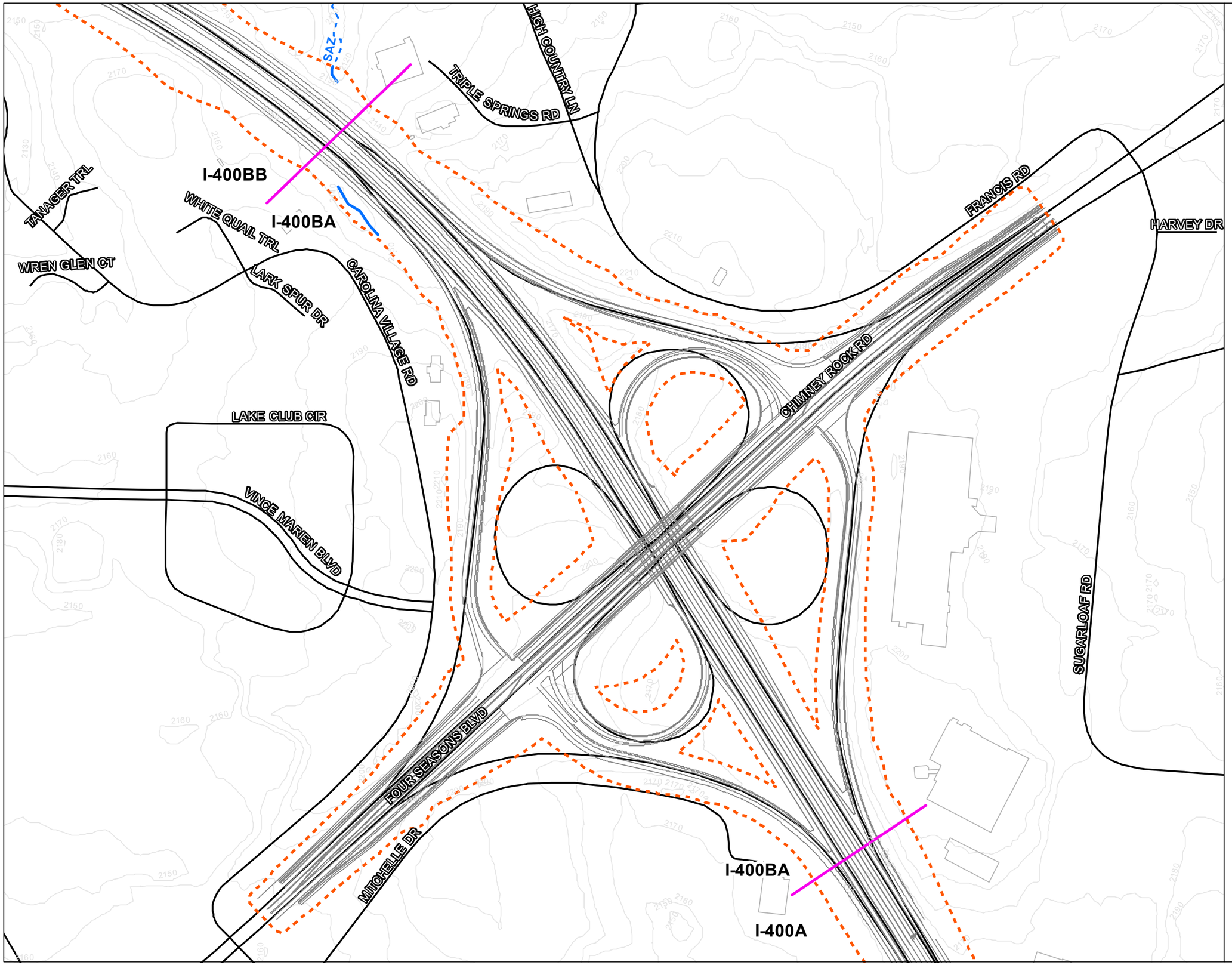
Sheet No.	*Name*	*Length (Feet)*
1	SA	40
3	SAA	144
4, 5	SAB	1,581
4	SAC	77
4	SAE	112
3	SAH	15
4	SAI	39
5	SAL	94
5	SAO	60
7	SAR	38
7	SAS	55
6	SAV	7
6	SAW	60
7	SAX	66
7	SBL	137
6	SBW	75
2	SQ	148
1	SS	250
2	SV	77
1, 2	SW	667
3	SZ	234
5	Devils Fork (SAJ)	1,091
	Dunn Creek (ST)	1
		Total: 5,068

Ponds

Sheet No.	*Name*	*Area (Acres)*
2	PM	**>0.1**


N
0
1.25
2.5
5
Miles
Legend
I-4400BA Section Area
I-4400/I-4700 Project Corridor
Road
Interstate
US Highway
NC Highway
Municipal Boundary
STIP Project No. I-4400
I-26 Widening
BA Section, Henderson County
BUNCOMBE COUNTY
HENDERSON COUNTY
TRANSYLVANIA COUNTY
RUTHERFORD COUNTY
POLK COUNTY
Biltmore Forest
Asheville
Fletcher
Mills River
Hendersonville
Laurel Park
Flat Rock
40
19
112
151
25
74
9
146
191
280
276
225
176


N
0 250 500 1,000
Feet
Legend
I-4400BA Map Sheets
I-4400/I-4700 Project Corridor
Road
Interstate
US Highway
NC Highway
STIP Project No. I-4400
I-26 Widening
BA Section Master Sheet
1
26
64
64
ATWOOD DR
GREENFIELD LN
MASTERMIND LN
CHIMNEY ROCK RD
SUGARLOAF RD
FOUR SEASONS BLVD
E PRINCE RD



N

0 125 250 500

Feet

Legend

- I-4400 Slope Stake Limits + 25-foot buffer (SS+25')
- Streams Within SS+25
- Ponds Within SS+25
- Wetlands Within SS+25
- Delineated Streams
- Delineated Ponds
- Delineated Wetlands
- Existing Road

STIP Project No. I-4400
I-26 Widening
BA Section: Sheet 1 of 1

STIP No. I-4400, Section BA

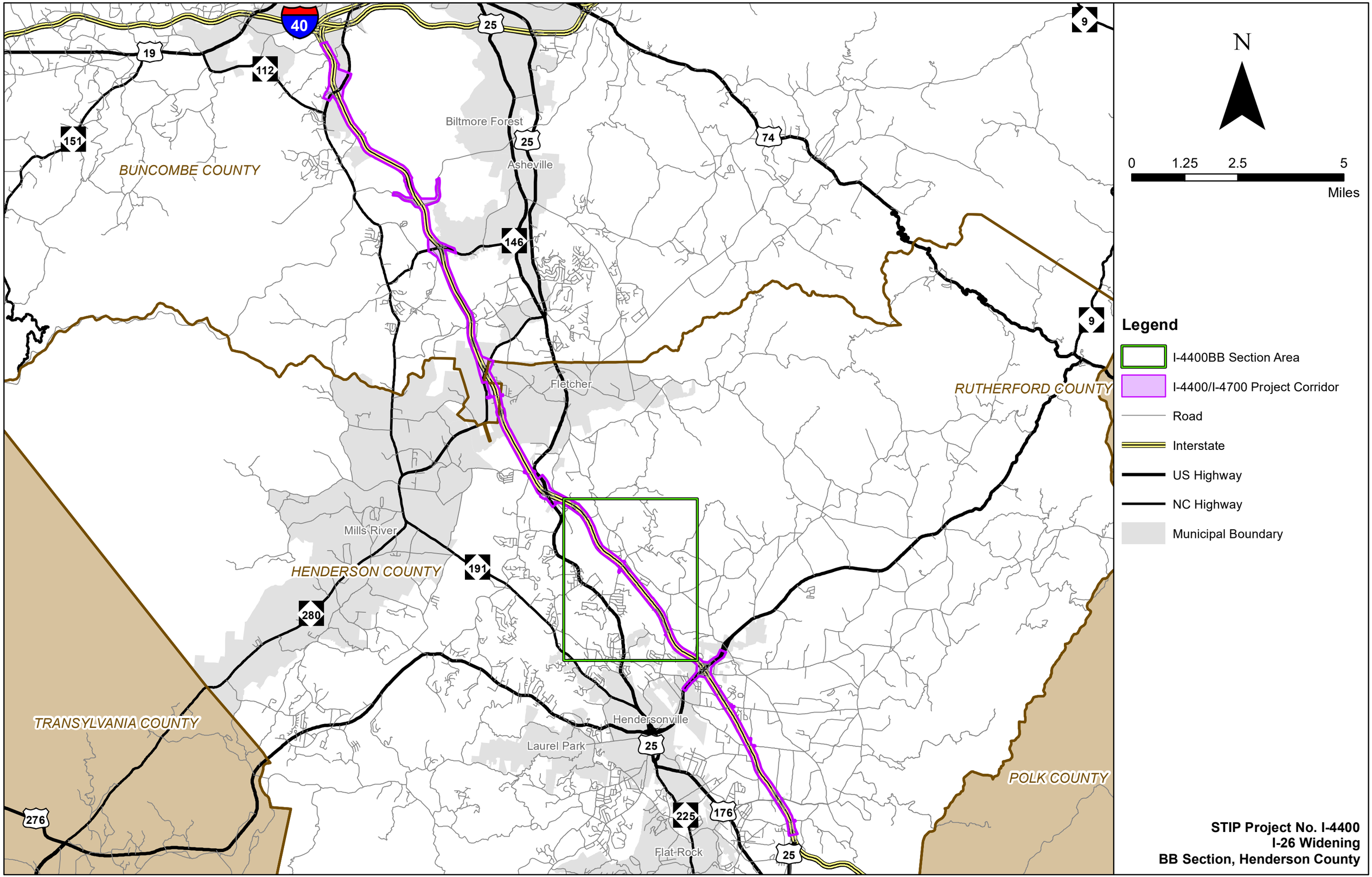
Summary Sheet: Impacts within slope stakes + 25'

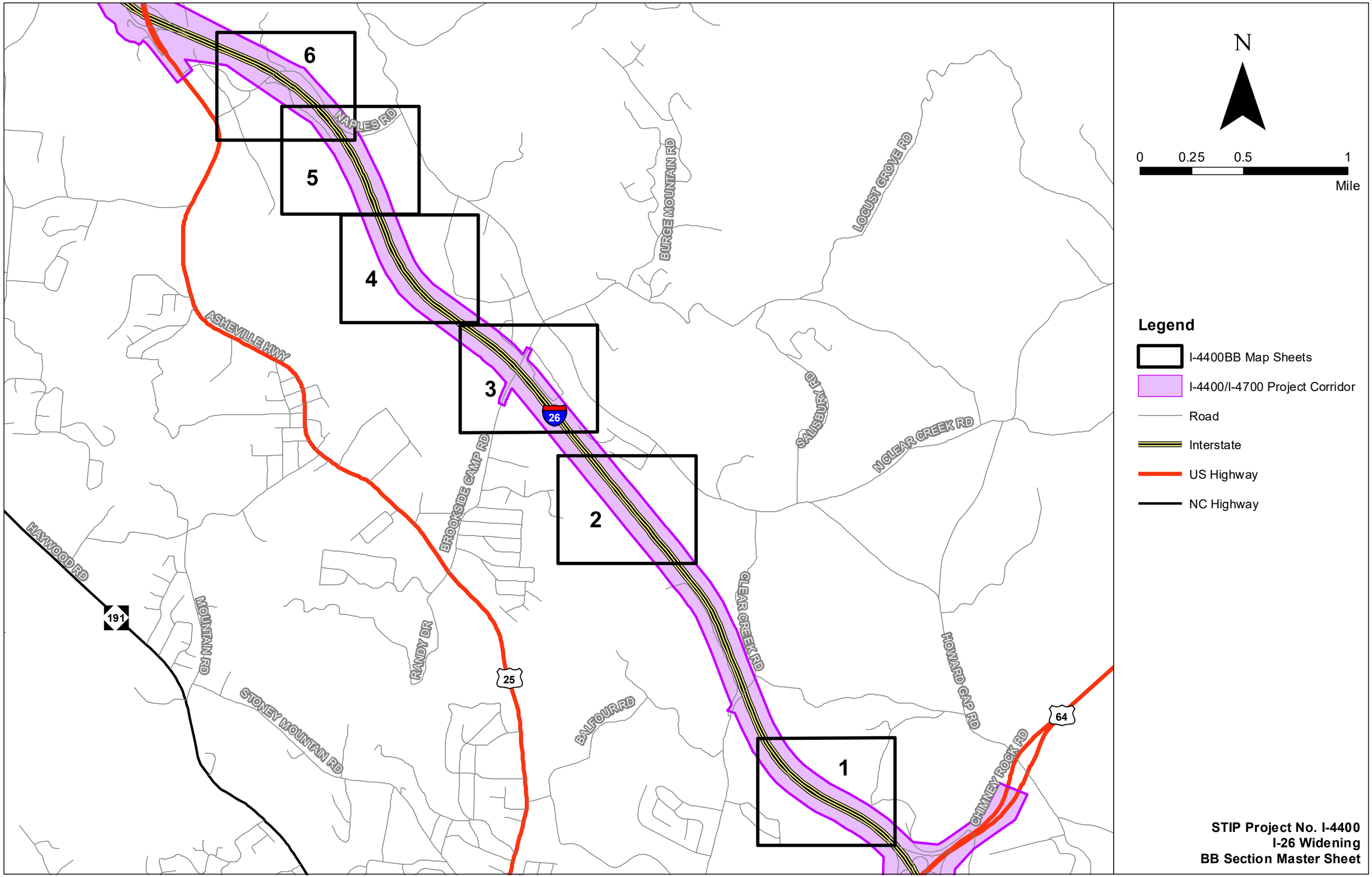
Note: wetland impacts calculated to nearest 0.01 acre; stream impacts calculate to nearest foot

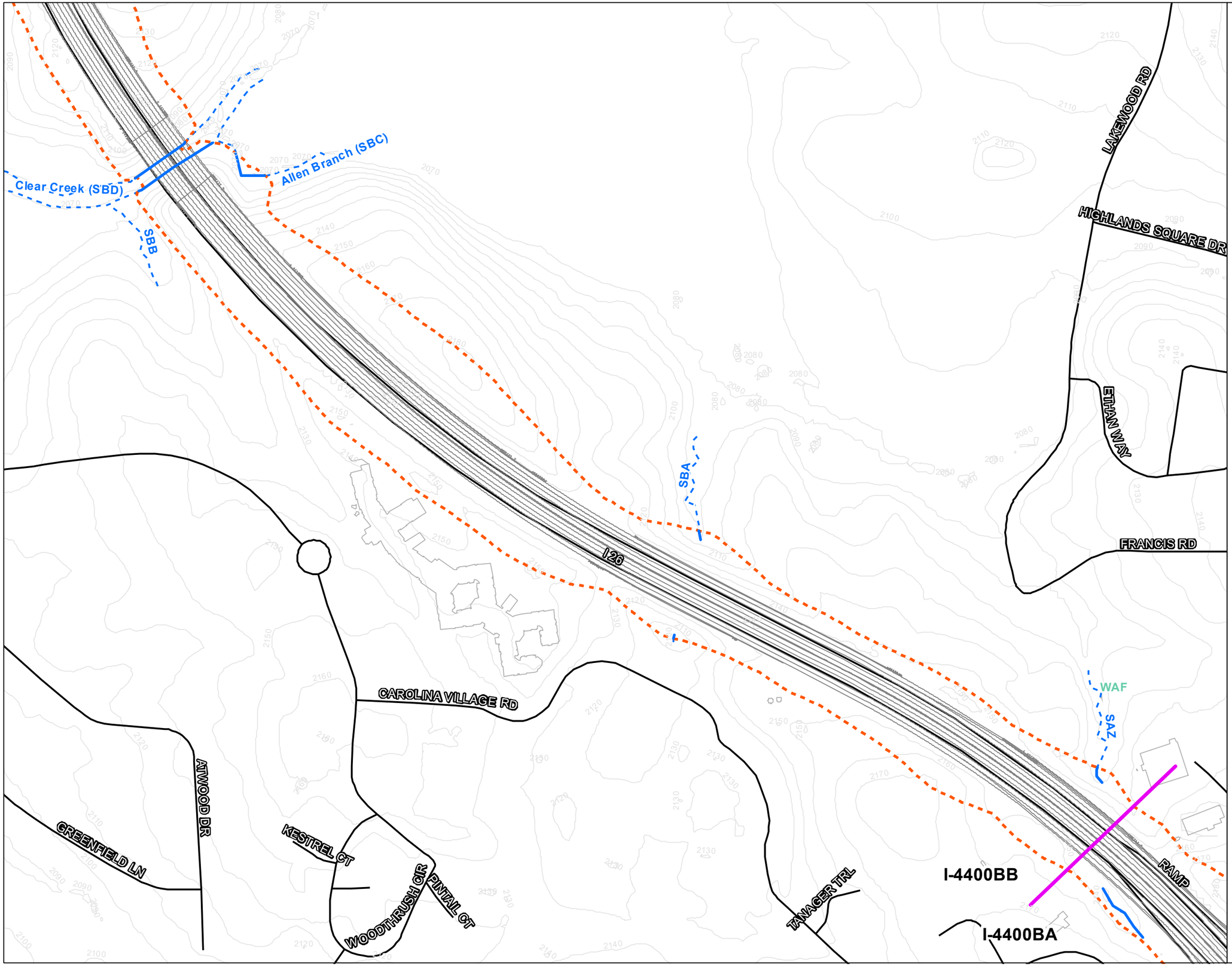
Wetlands		
Sheet No.	*Name*	*Area (Acres)*
N/a	N/a	N/a

Streams		
Sheet No.	*Name*	*Length (Feet)*
1	SAZ	**185**

Ponds		
Sheet No.	*Name*	*Area (Acres)*
N/a	N/a	N/a


N
0
1.25
2.5
5
Miles
Legend
I-4400BB Section Area
I-4400/I-4700 Project Corridor
Road
Interstate
US Highway
NC Highway
Municipal Boundary
STIP Project No. I-4400
I-26 Widening
BB Section, Henderson County
BUNCOMBE COUNTY
HENDERSON COUNTY
TRANSYLVANIA COUNTY
RUTHERFORD COUNTY
POLK COUNTY
Biltmore Forest
Asheville
Fletcher
Mills River
Hendersonville
Laurel Park
Flat Rock
40
25
19
112
151
146
74
9
191
280
225
176
276


6
5
4
3
2
1
NAPLES RD
ASHEVILLE HWY
BURGE MOUNTAIN RD
LOCUST GROVE RD
SALISBURY RD
N CLEAR CREEK RD
BROOKSIDE CAMP RD
CLEAR CREEK RD
HOWARD GAP RD
CHIMNEY ROCK RD
HAYWOOD RD
MOUNTAIN RD
RANDY DR
STONEY MOUNTAIN RD
BALFOUR RD
26
191
25
64
N
0
0.25
0.5
1
Mile
Legend
I-4400BB Map Sheets
I-4400/I-4700 Project Corridor
Road
Interstate
US Highway
NC Highway
STIP Project No. I-4400
I-26 Widening
BB Section Master Sheet



N

0 125 250 500

Feet

Legend

- I-4400 Slope Stake Limits + 25-foot buffer (SS+25')
- Streams Within SS+25
- Ponds Within SS+25
- Wetlands Within SS+25
- Delineated Streams
- Delineated Ponds
- Delineated Wetlands
- Road

STIP Project No. I-4400
I-26 Widening
BB Section: Sheet 1 of 6

N

0 125 250 500

Feet

Legend

- I-4400 Slope Stake Limits + 25-foot buffer (SS+25')
- Streams Within SS+25
- Ponds Within SS+25
- Wetlands Within SS+25
- Delineated Streams
- Delineated Ponds
- Delineated Wetlands
- Road

STIP Project No. I-4400
I-26 Widening
BB Section: Sheet 2 of 6

N

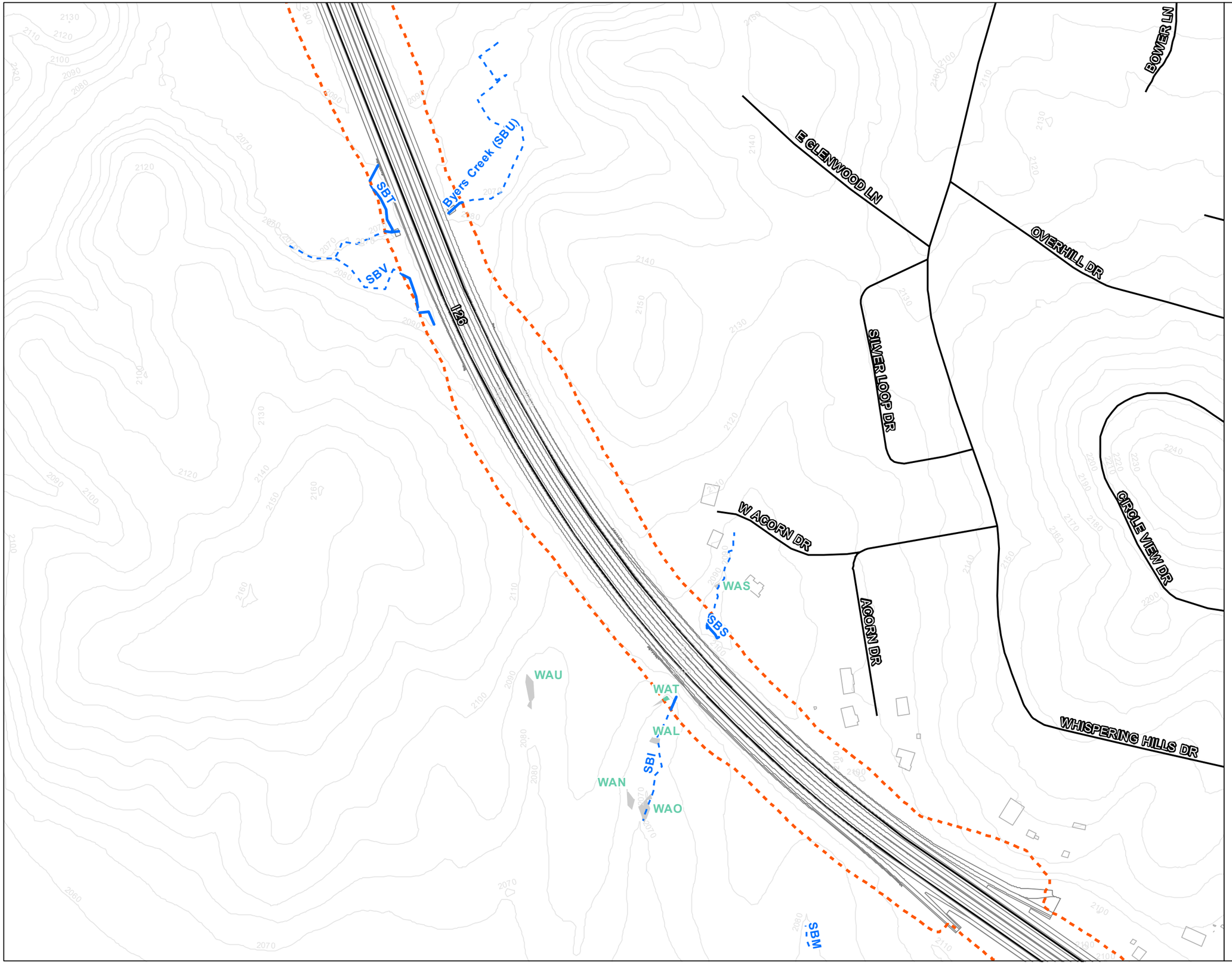
0 125 250 500

Feet

Legend

- I-4400 Slope Stake Limits + 25-foot buffer (SS+25')
- Streams Within SS+25
- Ponds Within SS+25
- Wetlands Within SS+25
- Delineated Streams
- Delineated Ponds
- Delineated Wetlands
- Road

STIP Project No. I-4400
I-26 Widening
BB Section: Sheet 3 of 6



N

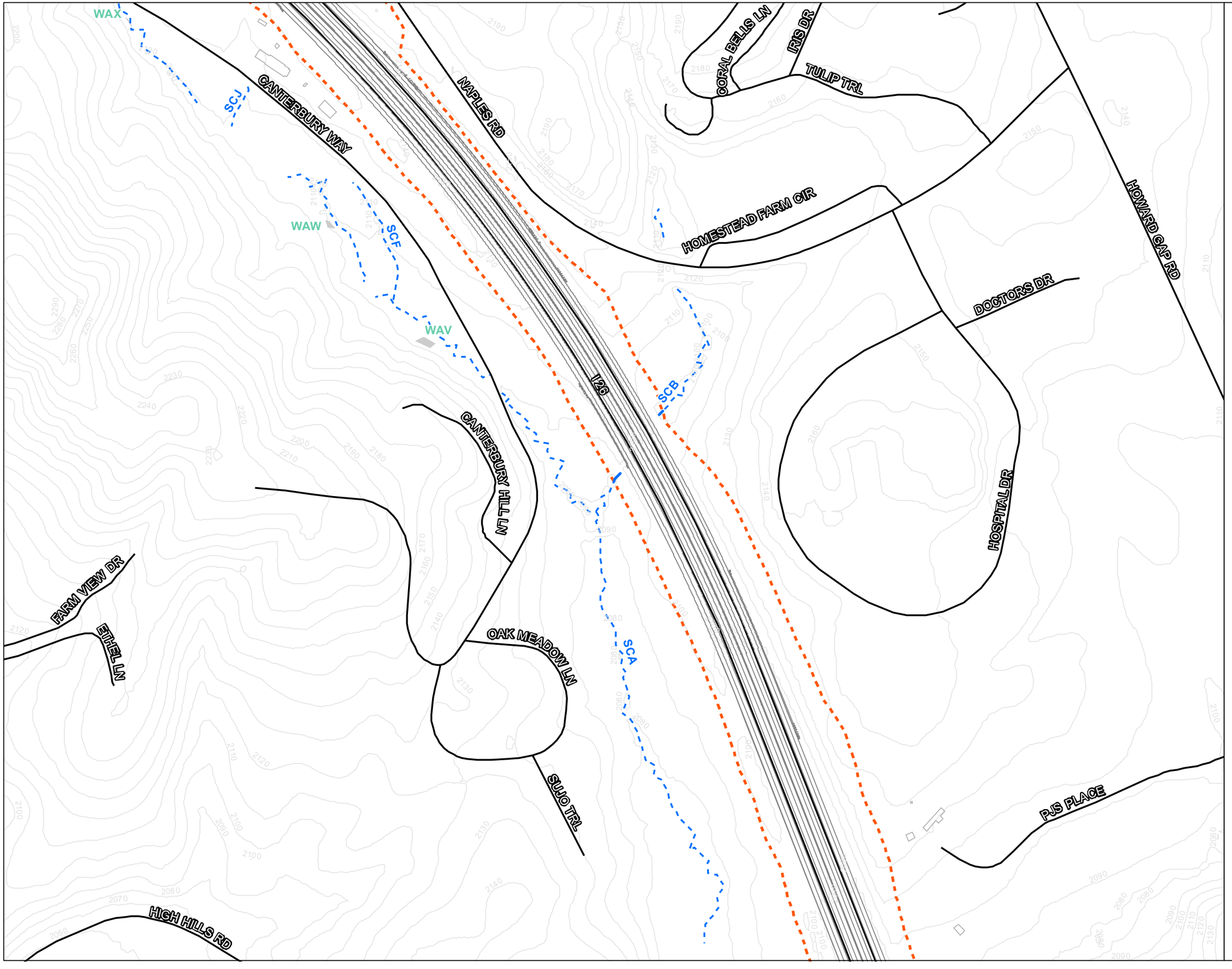
0 125 250 500

Feet

Legend

- I-4400 Slope Stake Limits + 25-foot buffer (SS+25')
- Streams Within SS+25
- Ponds Within SS+25
- Wetlands Within SS+25
- Delineated Streams
- Delineated Ponds
- Delineated Wetlands
- Road

STIP Project No. I-4400
I-26 Widening
BB Section: Sheet 4 of 6



N

0 125 250 500

Feet

Legend

- I-4400 Slope Stake Limits + 25-foot buffer (SS+25')
- Streams Within SS+25
- Ponds Within SS+25
- Wetlands Within SS+25
- Delineated Streams
- Delineated Ponds
- Delineated Wetlands
- Road

STIP Project No. I-4400
I-26 Widening
BB Section: Sheet 5 of 6

I-4400C

I-4400BB

SCI

SCN

SCM

SCH

WAY

I26

SCG

SCD

TWN SPRINGS RD

WILL RD

TOWER VIEW

SUNSET VISTA RD

FUCHSIA DR

OLD NAPLES RD

NAPLES GLENN TRL

PACK RD

N OLD ASHEVILLE RD

S NAPLES RD

S OLD ASHEVILLE RD

MARCH LN

ASHEVILLE HWY

WAX

SCA

SCJ

CANTERBURY WAY

NAPLES RD

WAW

SCF

SCB

N

0 125 250 500

Feet

Legend

- I-4400 Slope Stake Limits + 25-foot buffer (SS+25')
- Streams Within SS+25
- Ponds Within SS+25
- Wetlands Within SS+25
- Delineated Streams
- Delineated Ponds
- Delineated Wetlands
- Road

STIP Project No. I-4400
I-26 Widening
BB Section: Sheet 6 of 6

STIP No. I-4400, Section BB

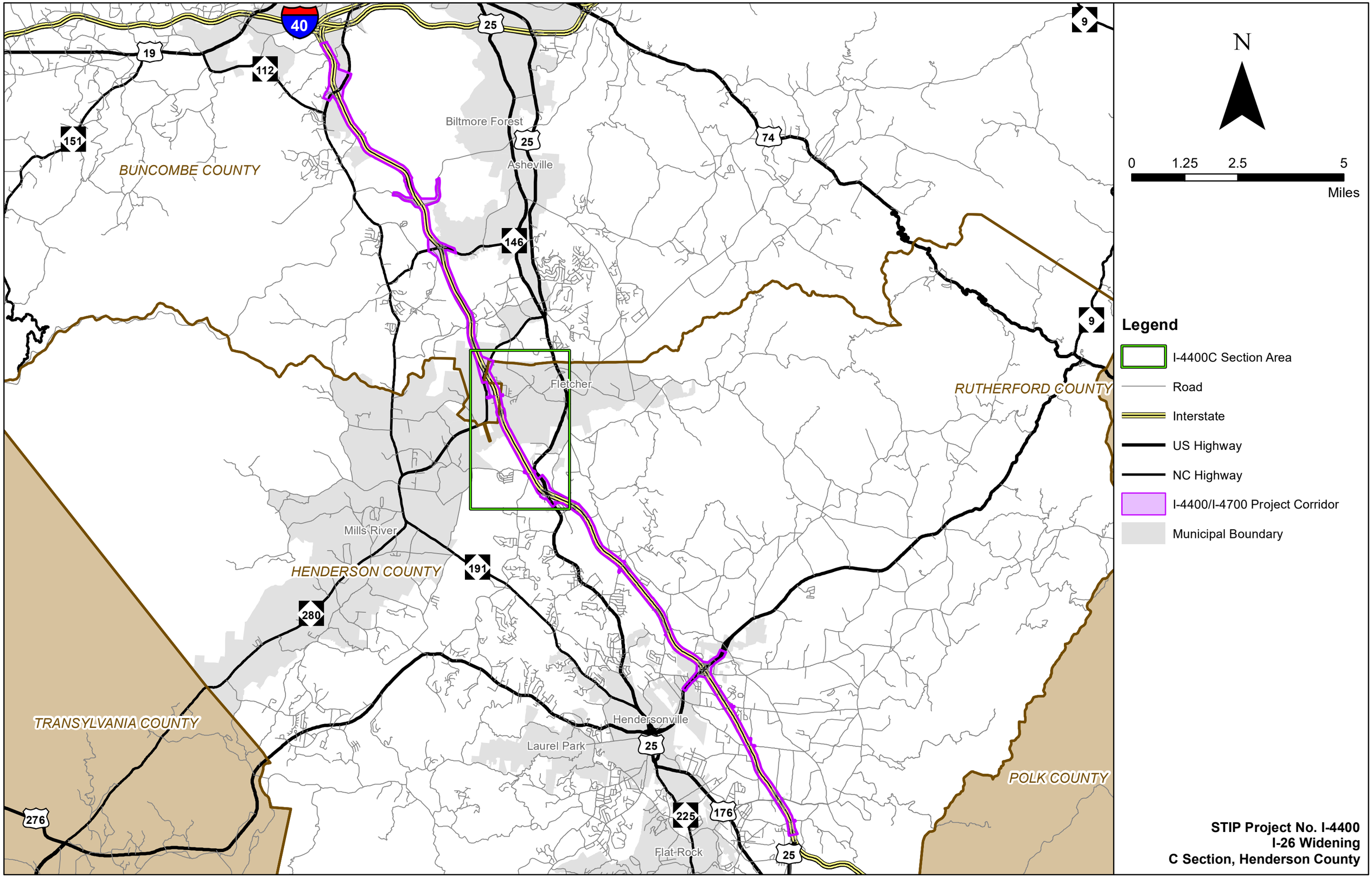
Summary Sheet: Impacts within slope stakes + 25'

Note: wetland impacts calculated to nearest 0.01 acre; stream impacts calculate to nearest foot

Wetlands		
Sheet No.	*Name*	*Area (Acres)*
2	WAH	0.01
2	WAM	0.01
2	WAP	0.02
4	WAT	<0.01
		Total: 0.04

Streams		
Sheet No.	*Name*	*Length (Feet)*
1	SAZ	51
1	SBA	36
2	SBF	169
2	SBG	248
4	SBI	88
3	SBO	52
4	SBS	55
4	SBT	192
4	SBV	176
6	SCA	192
5	SCB	43
6	SCD	176
6	SCG	193
6	SCH	39
6	SCM	6
6	SCN	159
1	Allen Branch (SBC)	133
4	Byers Creek (SBU)	89
1	Clear Creek (SBD)	216
3	Featherstone Creek (SBP)	41
		Total: 2,354

Ponds		
Sheet No.	*Name*	*Area (Acres)*
N/a	N/a	N/a


N
0
1.25
2.5
5
Miles
Legend
I-4400C Section Area
Road
Interstate
US Highway
NC Highway
I-4400/I-4700 Project Corridor
Municipal Boundary
STIP Project No. I-4400
I-26 Widening
C Section, Henderson County
BUNCOMBE COUNTY
HENDERSON COUNTY
TRANSYLVANIA COUNTY
RUTHERFORD COUNTY
POLK COUNTY
Biltmore Forest
Asheville
Fletcher
Mills River
Hendersonville
Laurel Park
Flat Rock
40
25
19
112
151
146
74
9
191
280
225
176
276

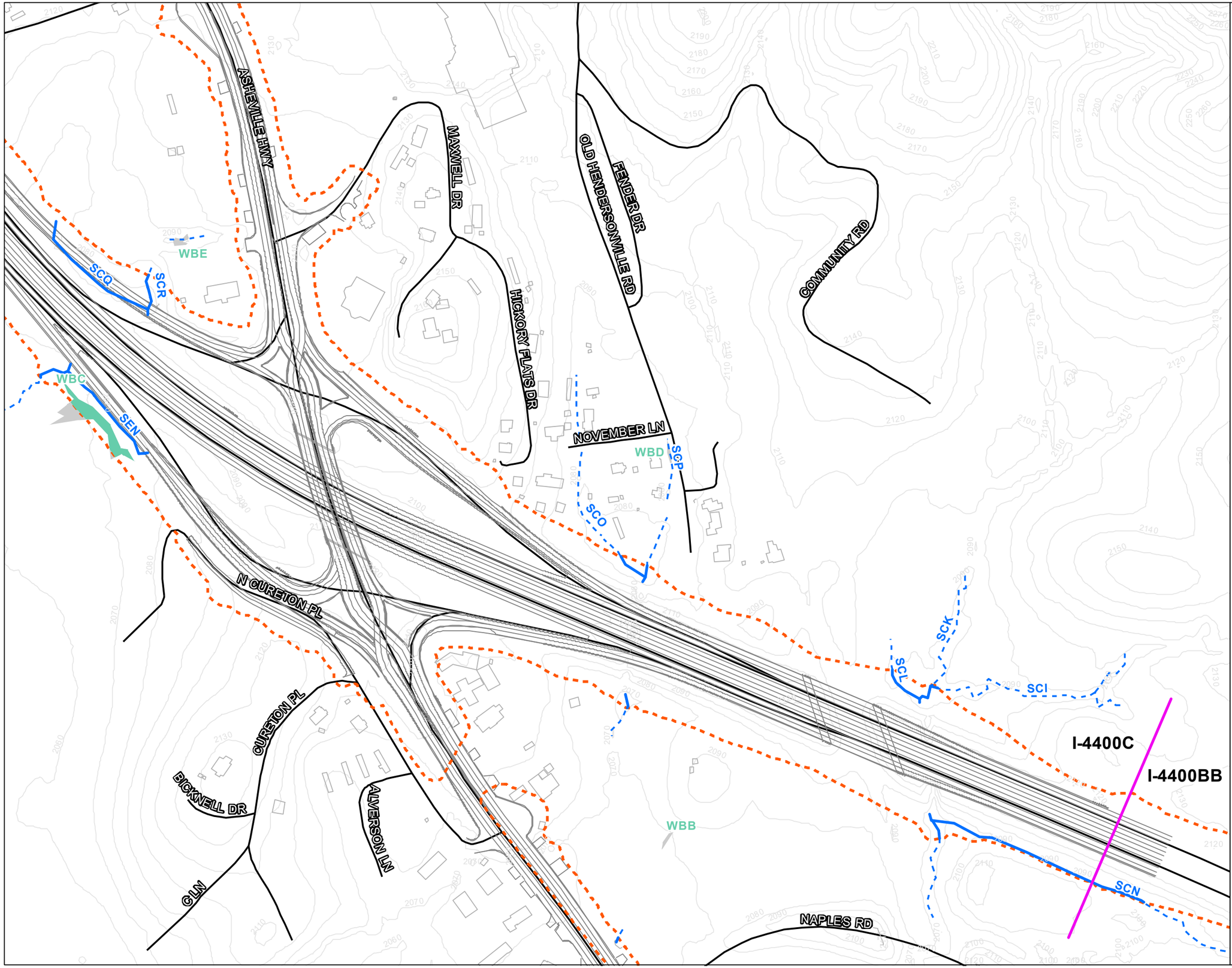
N

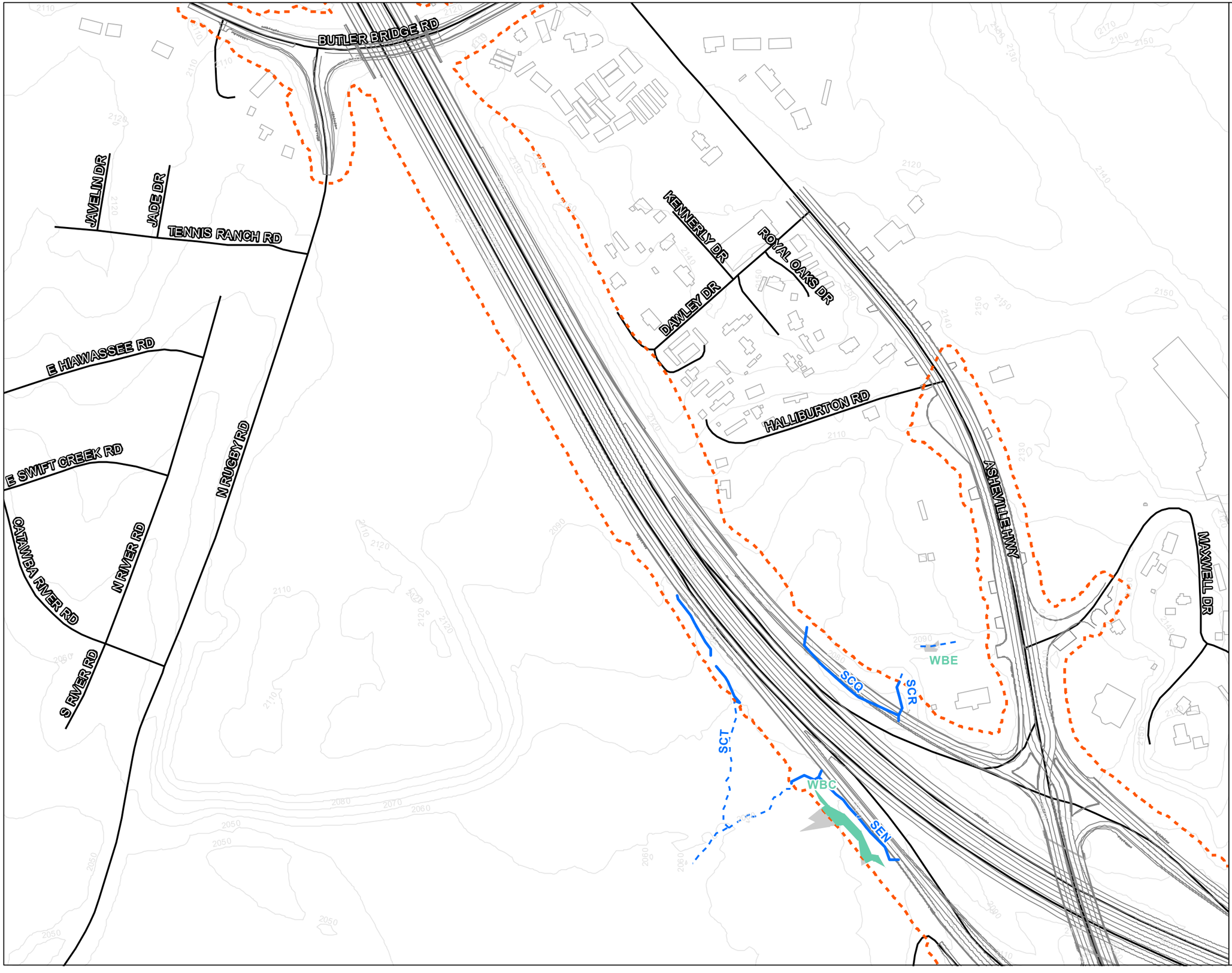
0 0.25 0.5 1
Mile

Legend

- I-4400C Map Sheets
- I-4400/I-4700 Project Corridor
- Road
- Interstate
- US Highway
- NC Highway

STIP Project No. I-4400
I-26 Widening
C Section Master Sheet


ASHEVILLE HWY
MAXWELL DR
HICKORY FLATS DR
OLD HENDERSONVILLE RD
FENDER DR
COMMUNITY RD
NOVEMBER LN
N CURETON PL
CURETON PL
BICKNELL DR
ALVERSON LN
GLN
NAPLES RD
WBE
WBC
WBD
WBB
SCQ
SCR
SEN
SCO
SCP
SCK
SCL
SCI
SCN
I-4400C
I-4400BB
N
0 125 250 500
Feet
Legend
I-4400 Slope Stake Limits + 25-foot buffer (SS+25')
Streams Within SS+25
Ponds Within SS+25
Wetlands Within SS+25
Delineated Streams
Delineated Ponds
Delineated Wetlands
Existing Road
STIP Project No. I-4400
I-26 Widening
C Section: Sheet 1 of 6



N

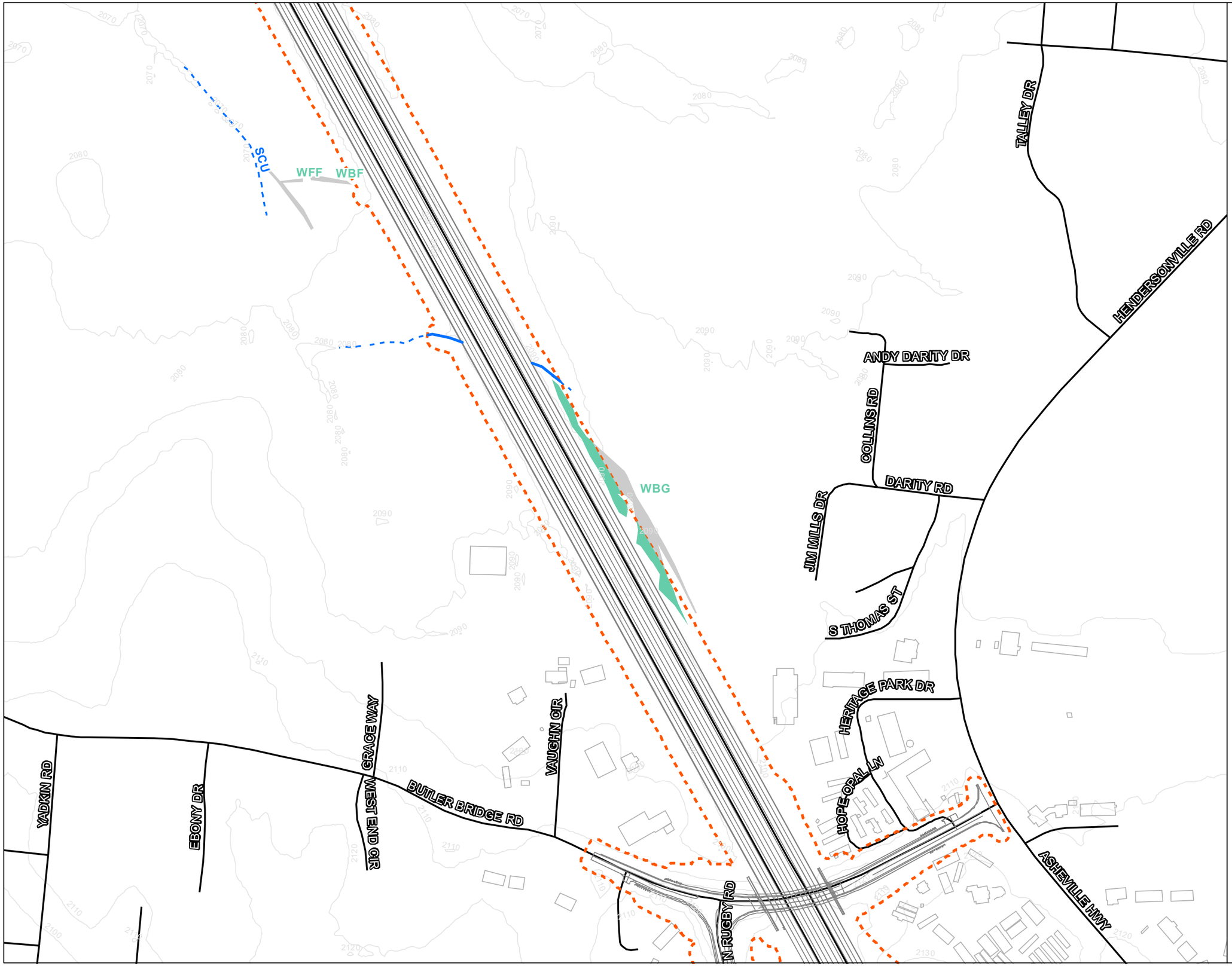
0 125 250 500

Feet

Legend

- I-4400 Slope Stake Limits + 25-foot buffer (SS+25')
- Streams Within SS+25
- Ponds Within SS+25
- Wetlands Within SS+25
- Delineated Streams
- Delineated Ponds
- Delineated Wetlands
- Existing Road

STIP Project No. I-4400
I-26 Widening
C Section: Sheet 2 of 6



N

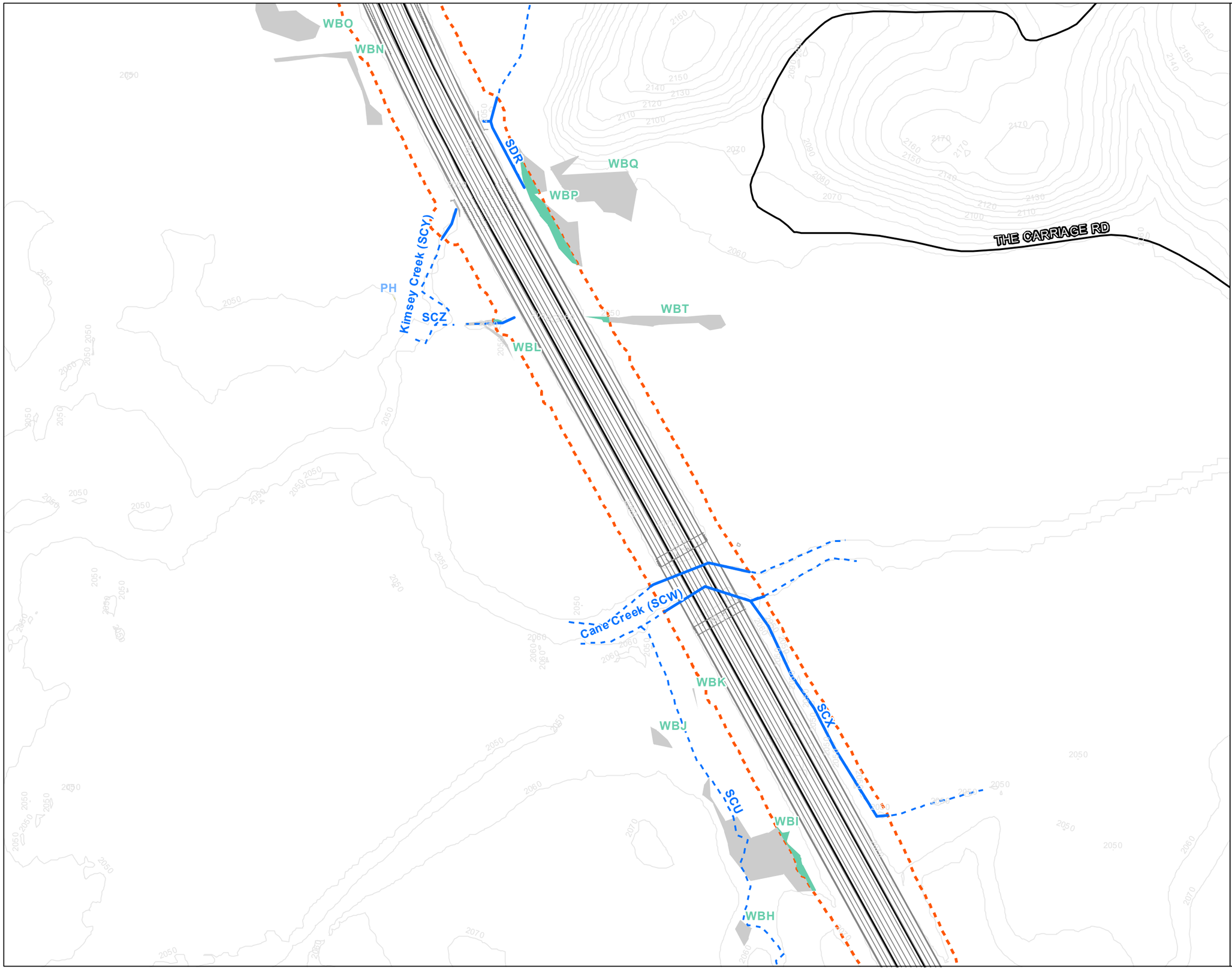
0 125 250 500

Feet

Legend

- I-4400 Slope Stake Limits + 25-foot buffer (SS+25')
- Streams Within SS+25
- Ponds Within SS+25
- Wetlands Within SS+25
- Delineated Streams
- Delineated Ponds
- Delineated Wetlands
- Existing Road

STIP Project No. I-4400
I-26 Widening
C Section: Sheet 3 of 6



N

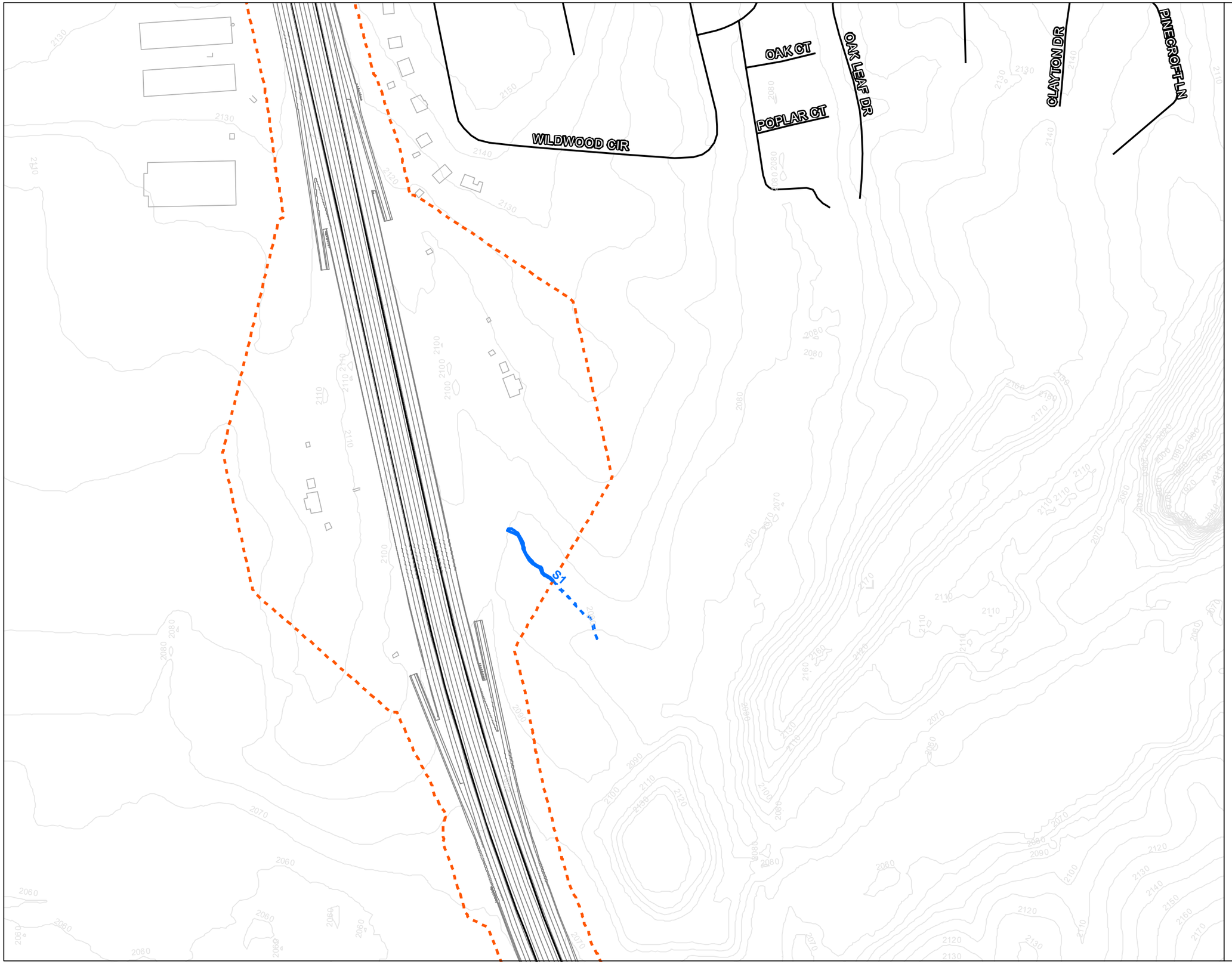
0 125 250 500

Feet

Legend

- I-4400 Slope Stake Limits + 25-foot buffer (SS+25')
- Streams Within SS+25
- Ponds Within SS+25
- Wetlands Within SS+25
- Delineated Streams
- Delineated Ponds
- Delineated Wetlands
- Existing Road

STIP Project No. I-4400
I-26 Widening
C Section: Sheet 4 of 6



N

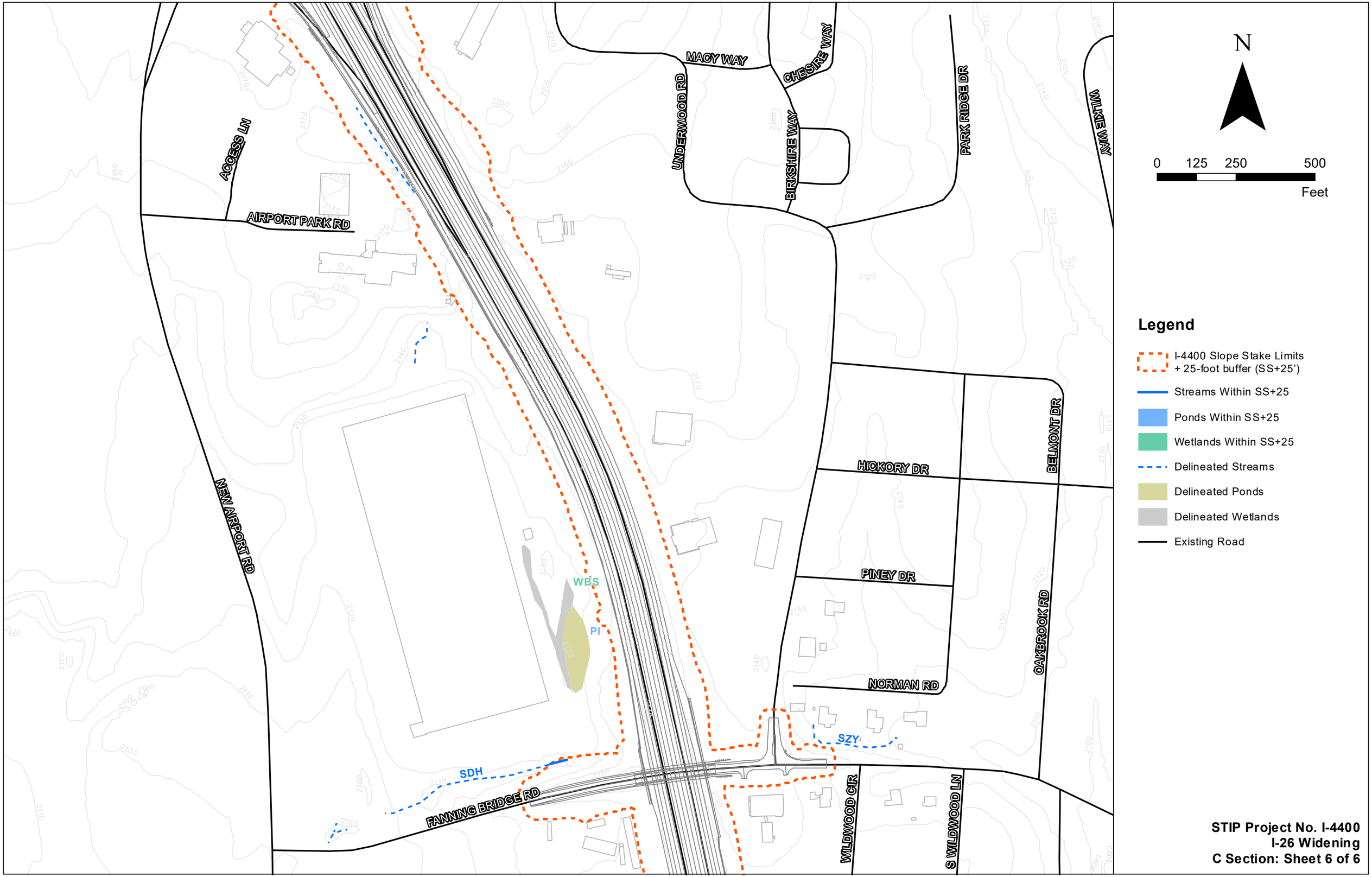
0 125 250 500

Feet

Legend

- I-4400 Slope Stake Limits + 25-foot buffer (SS+25')
- Streams Within SS+25
- Ponds Within SS+25
- Wetlands Within SS+25
- Delineated Streams
- Delineated Ponds
- Delineated Wetlands
- Existing Road

STIP Project No. I-4400
I-26 Widening
C Section: Sheet 5 of 6


N
0 125 250 500
Feet
Legend
I-4400 Slope Stake Limits + 25-foot buffer (SS+25')
Streams Within SS+25
Ponds Within SS+25
Wetlands Within SS+25
Delineated Streams
Delineated Ponds
Delineated Wetlands
Existing Road
ACCESS LN
AIRPORT PARK RD
NEW AIRPORT RD
MACY WAY
CHESIRE WAY
UNDERWOOD RD
BIRKSHIRE WAY
PARK RIDGE DR
WILKIE WAY
HICKORY DR
BELMONT DR
PINEY DR
OAKBROOK RD
NORMAN RD
WILDWOOD CIR
S WILDWOOD LN
FANNING BRIDGE RD
WBS
PI
SDH
SZY
STIP Project No. I-4400
I-26 Widening
C Section: Sheet 6 of 6

STIP No. I-4400, Section C

Summary Sheet: Impacts within slope stakes + 25'

Note: wetland impacts calculated to nearest 0.01 acre; stream impacts calculate to nearest foot

Wetlands

Sheet No.	*Name*	*Area (Acres)*
1, 2	WBC	0.15
3	WBG	0.37
4	WBI	0.06
4	WBL	0.01
4	WBP	0.17
4	WBT	0.01
		Total: 0.77

Streams

Sheet No.	*Name*	*Length (Feet)*
5	S1	208
1	SCI	21
1	SCK	155
1	SCL	124
1	SCN	495
1	SCO	165
1	SCP	32
1, 2	SCQ	521
1, 2	SCR	104
2	SCT	335
3	SCU	200
4	SCX	750
4	SCZ	61
6	SDH	54
4	SDR	214
1, 2	SEN	341
4	Cane Creek (SCW)	307
4	Kimsey Creek (SCY)	181
		Total: 4,268

Ponds

Sheet No.	*Name*	*Area (Acres)*
N/a	N/a	N/a