STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

ROY COOPER
GOVERNOR

JAMES H. TROGDON, III
SECRETARY

July 26, 2019

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

ATTN: Ms. Loretta Beckwith
NCDOT Coordinator

Subject: **Request for Modification to the Section 404 Individual Permit and Section 401 Water Quality Certification** for the proposed I-26 Widening from US 64 (Exit 49) to US 25 Business (Exit 44) [I-4400BB] and from US 25 Business (Exit 44) to NC 280 (Exit 40) [I-4400C] in Henderson County, Federal Aid Nos. NHP-0026(015)/NHPP-026-1(200)13, TIP Project Nos. I-4400BB / I-4400C; Division 14; and for modification of the permitted I-4700A&B sections.
Debit $570 from WBS No. 34232.1.6

Reference: USACE Individual Permit Action ID: SAW-2013-01833, dated June 21, 2019
NCDWR Project No. 20181645 (Mod. 2), 401 WQC, dated June 19, 2019

Dear Ms. Beckwith:

The purpose of this letter is to request a modification to the United States Army Corps of Engineers (USACE) Section 404 Individual Permit and to the North Carolina Division of Water Resources (NCDWR) Section 401 Certification for the above-referenced project. The original 404 Individual Permit and 401 Water Quality Certification (referenced above) were phased permit authorizations for the entire I-4400/I-4700 project that 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. That phased permit authorization (for Phase 1) was for the two I-4700 sections of the project (I-4700A and I-4700B). This Modification application presents final impacts for two sections of the I-4400 portion of the project, from US 64 (Exit 49) to US 25 Business (Exit 44) [I-4400BB] and from US 25 Business (Exit 44) to NC 280 (Exit 40) [I-4400C] in Henderson County. These two sections are scheduled to let in September 2019. A permit modification application for the final impacts for the remaining sections of the project (I-4400A and I-4400BA) will be submitted prior to letting of those sections.

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Additionally, this application includes modifications to nine (9) sites in the I-4700A and I-4700B section that were permitted for trenchless (bore and jack) installation of new pipes. Due to the amount of large rock that is present in the existing roadway embankment at some of these sites, NCDOT anticipates that trenchless installation of pipes will be difficult, costly and take additional time if large rock is encountered during the boring operation. A hydraulic analysis was performed at the selected locations. It was determined that at several locations the Welded Steel Pipes (WSP) could be eliminated and the existing pipe would provide an adequate hydraulic capacity with an "improved" tapered inlet used to increase the capacity of the pipe. The improved inlet acts as a funnel to provide a smoother transition from the channel into the pipe than can be obtained using an open-ended pipe or a standard headwall. Additional information is provided in the I-4700 A & B section of this application (Page 15 of 19 - Page 17 of 19).

Please see the enclosed revised Division of Mitigation Service (DMS) mitigation acceptance letters for I-4400BB and I-4400C; Meeting Minutes – Concurrence Point 4B (I-4400BB and I-4400C together) and Concurrence Points 4C; State Stormwater Management Plans (SMP) with permit drawings; and roadway plans.

Summary of Jurisdictional Impacts:

The number of jurisdictional resources impacted by the project, broken down by section, is presented in Table 1. Impact Totals for I-4400BB and I-4400C have changed from Preliminary Design (in referenced permit) to Final Design and are **bolded**.

Table 1. Summary of Water Resources Impacted per Section

Section	Design Stage	Proposed LET	Total # Wetlands Impacted		Total # Streams Impacted		Total # Ponds Impacted	
			Permitted*	Final	Permitted*	Final	Permitted*	Final
I-4400A	Prelim.[1/]	1/1/2040	13	--	23	--	1 [2/]	--
I-4400BA	Prelim.[1/]	10/18/2022	0	--	1	--	0	--
I-4400BB	**Final**	**9/17/2019**	**4** [3/]	**4**	**20** [3/]	**24**	**0** [3/]	**0**
I-4400C	**Final**	**9/17/2019**	**6** [3/]	**6**	**18** [3/]	**16**	**0** [3/]	**0**
I-4700A	Final	Permitted	4	4	8	8	0	0
I-4700B	Final	Permitted	6	6	15	15	0	0

*404 Permit USACE Action ID: SAW-2013-01833; 401 WQC NCDWR Project No.: 20181645 Modification 2.

[1/] Preliminary totals were determined by measuring 25' outside of preliminary slope stake lines.

[2/] Pond impact is 0.000078 acre (rounds to <0.01 for impact reporting quantity)

[3/] Impacts for I-4400BB and I-4400C were permitted (in referenced permit) based on Preliminary Design

The total number of Streams impacted for **I-4400BB** increased from 20 to 24. The change in impacts is due to going from Preliminary Design (that used the slope stake +25 feet) to Final Design that slightly changed the project footprint, resulting in a reduction in total linear footage of stream impacts, but a slight increase in the number of streams impacted. Based on Final Design, there are impacts to six (6) additional streams, and the elimination of impacts to two (2) streams.

The six (6) streams being impacted that were not included in the Preliminary Design (totaling 176 linear feet of permanent impacts) are in Section I-4400BB and are explained here:

- SBE: Site 9 (106 lf of permanent impact to an intermittent stream not accounted for in Preliminary Design. The impact is from filling an existing pipe and trenchless installation of a proposed 42-inch WSP that needs to be moved to allow for the tie-in of a lateral base ditch).

- SBY: Site 10 - (16 lf of permanent impact for channel change [with outlet protection] at the outlet of a proposed 54-inch RCP. Due to steep grade, the RCP needs to outlet on the other side Hyder Farm Road).

- SBX: Site 11 - (10 lf of permanent impact for channel change [with outlet protection] at the outlet of a proposed 30-inch RCP. Due to steep grade, the RCP needs to outlet on the other side Hyder Farm Road).

- SBR: Site 17 - (16 lf of permanent bank stabilization impacts to stabilize the bank for the outlet of stormwater to Stream SBR, outside of the Preliminary limits).

- SBN: Site 20 - (13 lf of impact to allow for the proposed pipe being replaced to extend to the other side of the weigh station).

- SBJ: Site 29 - (15 lf of permanent impact for channel change [with bank stabilization] at the outlet of a proposed 36-inch WSP. It appears that this impact was not captured during the Preliminary impact calculations.

The two streams that had Preliminary Design impacts (a total of 335 linear feet) excluded from Final Design are:
- SBV: (176 linear feet of Preliminary Impacts)
- SCN: (159 linear feet of Preliminary Impacts)

The total number of streams impacted in section **I-4400C** decreased from 18 to 16.

The total number of streams impacted in sections **I-4700A** and **I-4700B** remains unchanged**.**

Summary of Wetland Impacts per Section

The total and projected wetland impacts, broken down by section, are presented in Table 2. The updated impact values for I-4400BB and I-4400C are based on Final Design, which were previously permitted based on Preliminary Design. The updated values are bolded.

The total acreage of wetland impacts for **I-4400BB**, as shown in Table 2, increased from 0.04 to 0.05. However, there is no actual increase in impacts, as Wetlands WAM and WAP are "total takes" and were considered as total takes during Preliminary Design. The difference is due to more precise measurement for Final Design and the rounding of very small values.

The total acreage of wetland impacts for **I-4400C** decreased from 0.77 to 0.71 from Preliminary Design to Final Design.

There are no changes to permitted wetland impacts for **I-4700A** and **I-4700B**.

Table 2. Summary of Wetland Impacts per Section

Section	Design Stage	Wetland Impact area (ac)		Impacts requiring Mitigation (ac)
		Permitted*	Final Design	
I-4400A	Preliminary [1/]	0.54	--	N/A [2/]
I-4400BA	Preliminary [1/]	0	--	0
I-4400BB	**Final**	0.04 [3/]	**0.05**	**0.05**
I-4400C	**Final**	0.77 [3/]	**0.71**	**0.71**
I-4700A	Final	0.74	0.74	0.74
I-4700B	Final	0.82	0.82	0.82

*404 Permit USACE Action ID: SAW-2013-01833; 401 WQC NCDWR Project No.: 20181645 Modification 2.

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

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

[3/] Impacts for I-4400BB and I-4400C were permitted (in referenced permit) based on Preliminary Design.

Summary of Stream Impacts per Section

The total and projected stream impacts, broken down by section, are presented in Table 3, along with the corresponding mitigation requirements. The updated impact values for I-4400BB and I-4400C are based on Final Design, which were permitted based on Preliminary Design. The permanent stream impact totals for **I-4400BB** and **I-4400C** decreased for Final Design. The updated values are bolded. The corresponding mitigation requirements have also decreased. The revised mitigation for each of these sections is presented in Table 3.

Additionally, revised impact values for I-4700A and I-4700B are the result of revisions at some sites. The revisions to these permitted sites are a change from trenchless installation of new pipes, to lining of existing pipes (see Table 9).

The permanent stream impacts for **I-4700A** remained unchanged, while the temporary stream impacts decreased. The permanent and temporary stream impacts for **I-4700BB** have both decreased.

Table 3. Summary of Stream Impacts per Section

Section	Design Stage	Permanent Stream Impact (lf)		Temporary Stream Impact (lf)		Impacts Requiring ACOE Mitigation (lf) [1/]	
		Permitted*	Final	Permitted*	Final		
I-4400A	Preliminary [2/]	5,068	--	X	--	N/A[3/]	
I-4400BA	Preliminary [2/]	185	--	X	--	185	
I-4400BB	Final	2,354 [4/]	**1,637**	X	**343**	**716** [5/]	
I-4400C	Final	4,268 [4/]	**3,559**	X	**178**	**2,952** [5/]	
I-4700A	Final	1,404	1,404	121	99	1,158	2,611 [6/]
I-4700B	Final	1,552	1,499	1,480	1,466	1,453	

* 404 Permit USACE Action ID: SAW-2013-01833; 401 WQC NCDWR Project No.: 20181645 Modification 2.

[1/] Bank stabilization impacts have been deducted from the Total permanent stream impacts for sections in Final Design for determination of mitigation requirements.

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

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

[4/] Impacts for I-4400BB and I-4400C were permitted (in referenced permit) based on Preliminary Design.

[5/] Revised mitigation value based on Final Design.

[6/] Mitigation provided by DMS is a cumulative total for I-4700 A&B sections.

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

Summary of Mitigation:

NCDOT submitted DMS letters with the original permit application that documented the amount of mitigation reserved for each section of the project, except for I-4400A, as the proposed Let date is in 2040. Those mitigation totals for I-4400BB and I-4400C were based on Preliminary Design. As these sections are now in Final Design, mitigation requirements are updated accordingly (see Tables 2 and 3). This revised mitigation quantities have been received from DMS.

NEPA DOCUMENT STATUS

Since the submittal of the Phased Individual Permit application for this project, a combined *Final EIS (FEIS) / Record of Decision (ROD)* has been finalized and was signed on March 5, 2019.

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 has been permitted in phases due to project size, funding, and STIP schedule. Table 4 lists the project sections and phasing. Sections I-4400BB and I-4400C have been updated with their current LET date. Sections I-4700A&B have been updated to note that they have been LET.

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	September 17, 2019
I-4400C	From US 25 Business (Exit 44) to NC 280 (Exit 40)	3.5	September 17, 2019
I-4700A	From NC 280 (Exit 40) to NC 146-Long Shoals Rd. (Exit 37)	3.3	Let
I-4700B	From NC 146-Long Shoals Rd. (Exit 37) to I-40.	5.3	Let

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

Sections I-4400BB and I-4400C each have a Let date of September 17, 2019. NCDOT will need permits by August 28, 2019, in order to start the contract for this project.

303(d) Impaired Waters:
A more recent version of NCDWR's 303(d) list came into effect since the submittal of the Phased IP application. No streams impacted by the I-4400BB or I-4400C project are listed for turbidity and/or sedimentation on the 2018 Final 303(d) list.

IMPACTS TO WATERS OF THE U.S.

Tables 5 and 6 summarize the impacts to jurisdictional wetlands and streams, respectively, for the I-4400BB section; Tables 7 and 8 summarize the impacts to jurisdictional wetlands and streams, respectively, for the I-4400C section; and Table 9 summarizes the revisions to permitted sites in the I-4700A&B sections. All stream impacts for I-4400BB, I-4400C, and I-4700A&B are within French Broad River Basin.

Section I-4400BB:

Table 5 – I-4400 BB Wetland Impacts

Permit Site / Wetland ID[1/]	NC WAM Classification	Wetland Size (ac)	Perm. Fill in Wetlands (ac)	Excavation (ac)	Mechanized Clearing (ac)	Impact Description
12 / WAH	Headwater Forest	0.01	<0.01	<0.01	<0.01	Impact to wetland due to road widening and for a proposed 36-inch CSP and 15-inch CSP.
13 / WAP	Headwater Forest	0.03	--	0.03	--	Excavation for proposed 2-foot Lateral Base Ditch (Total Take).
14 / WAM	Headwater Forest	0.02	--	--	0.02	Mechanized clearing in wetland due to road widening (Total Take).
21 / WAT	Headwater Forest	0.01	<0.01	--	<0.01	Fill in wetland and mechanized clearing due to road widening.
Totals by Impact Type [2/]:			**<0.01**	**0.03**	**0.02**	
Total Permanent Wetland Impacts [2/]:			**0.05 [3/]**			

[1/] Wetland IDs correspond to I-4400/4700 PJD labeling;

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

[3/] Mitigation for 0.05 acre of wetland impact has been obtained from DMS to compensate for wetland impacts on I-4400BB.

Table 6 – I-4400BB Stream Impacts

Permit Site	Stream Name / ID[1/]	Stream Status[2/]	Permanent Channel Impacts (lf)	Bank Stabilization (lf)	Temp. Channel Impacts (lf)	ACOE Required Mitigation[3/]	DWR Required Mitigation[3/]	Permanent Impacts Description
1	UT to Cherry Branch / **SAZ**	P	31	--	--	2:1	No	Proposed 48-inch WSP; trenchless installation (jack and bore).
			--	15	10	--	No	Bank stabilization at outlet of proposed 48-inch WSP/Headwall.
2	UT to Cherry Branch / **SAZ**	I	--	--	10	--	No	Temporary impact associated with installation of proposed 48-inch WSP.
3	UT to Cherry Branch / **SBA**	I	--	26	--	--	No	Bank stabilization – at inlet of proposed Headwall for existing/retained 60-inch WSP and proposed 60-inch WSP (trenchless installation).
4	UT to Cherry Branch / **SBA**	I	--	68	10	--	No	Bank stabilization – at outlet of proposed Headwall for existing/retained 60-inch WSP and proposed 60-inch WSP (trenchless installation).

Permit Site	Stream Name / ID[1/]	Stream Status[2/]	Permanent Channel Impacts (lf)	Bank Stabilization (lf)	Temp. Channel Impacts (lf)	ACOE Required Mitigation[3/]	DWR Required Mitigation[3/]	Permanent Impacts Description
5	Allen Branch / **SBC**	P	--	6	10	--	No	Bank stabilization – at outlet of proposed 30-inch CSP
6	Clear Creek / **SBD**	P	--	308	20	--	No	Bank stabilization – at bridge site.
7	Allen Branch / **SBC**	P	--	87	16	--	No	Bank stabilization – along fill slope.
8	Site 8 removed, per CP4C comments (proposed bank stabilization already exists at this location for Site 6)							
9	UT to Clear Ck. / **SBE**	I	106	--	--	1:1	No	Proposed 42-inch WSP; trenchless installation (jack and bore).
			--	12	10	--	No	Bank stabilization at outlet of proposed 42-inch WSP.
10	UT to Mud Creek/ **SBY**	P	16	--	7	2:1	No	* Channel Change (w/ outlet protection) – at outlet of proposed 54-inch RCP.
11	UT to Mud Creek/ **SBX**	P	10	--	5	2:1	No	* Channel Change (w/ outlet protection) – at outlet of proposed 30-inch RCP.
15	Featherstone Ck/ **SBP**	P	7	--	--	2:1	No	Culvert extension – of 3 @ 8X8 RCBC outlet due to roadway widening.
			--	64	10	--	No	Bank stabilization – at outlet of proposed 3 @ 8X8 RCBC.
16	Featherstone Ck/ **SBP**	P	8	--	--	2:1	No	Culvert extension – of 3 @ 8X8 RCBC inlet due to roadway widening.
			--	55	10	--	No	Bank stabilization – at inlet of proposed 3 @ 8X8 RCBC.
17	UT to Mud Creek/ **SBR**	I	--	16	10	--	No	Bank stabilization – at outlet of proposed 48-inch WSP.
18	UT to Mud Creek/ **SBO**	P	38	--	10	2:1	No	Proposed 66-inch WSP; trenchless installation (jack and bore).
19	UT to Mud Creek/ **SBO**	P	22	--	10	2:1	No	Channel change (w/ outlet protection) – at outlet of proposed 66-inch WSP (trenchless installation).
20	UT to Mud Creek/ **SBN**	I	13	--	10	1:1	No	* Channel change (w/ outlet protection) – at outlet of proposed 36-inch RCP.

Permit Site	Stream Name / ID[1/]	Stream Status[2/]	Permanent Channel Impacts (lf)	Bank Stabilization (lf)	Temp. Channel Impacts (lf)	ACOE Required Mitigation[3/]	DWR Required Mitigation[3/]	Permanent Impacts Description
21	UT to Mud Creek/ **SBI**	P	22	--	4	2:1	No	* Channel change (w/ outlet protection) – at outlet of proposed 66-inch WSP.
			19	--	--	2:1	No	Proposed 66-inch WSP; trenchless installation (jack and bore).
22	UT to Mud Creek/ **SBS**	I	168	--	--	1:1	No	Stream relocation – due to roadway widening, stream relocated to proposed 2-foot Lateral Base Ditch.
23	Byers Creek / **SBU**	P	15	--	--	2:1	No	Culvert extension – extension of existing 2 @ 10X8 RCBC inlet due to roadway widening.
			--	54	10	--	No	Bank stabilization – at inlet of proposed 2 @ 10X8 RCBC extension.
24	Byers Creek / **SBU**	P	10	--	--	2:1	No	Culvert extension – extension of existing 2 @ 10X8 RCBC outlet due to roadway widening.
			--	48	10	--	No	Bank stabilization – at outlet of proposed 2 @ 10X8 RCBC extension.
25	UT to Clear Ck. / **SBE**	I	--	--	10	--	No	Temporary impacts associated with the trenchless installation of a 42-inch WSP and Head Wall (opposite Site 9).
26	UT to Byers Ck. / **SBT**	I	--	12	10	--	No	Bank stabilization – at outlet of proposed 36-inch RCP.
			--	15	10	--	No	Bank stabilization – at confluence of SBT with Byers Creek.
27	UT to Byers Ck. / **SCB**	P	23	--	10	2:1	No	* Channel change (w/ outlet protection) – at outlet of proposed 66-inch WSP (trenchless installation).
28	UT to Byers Ck. / **SCB**	P	20	--	10	2:1	No	Channel change (w/ bank stabilization) – at inlet of proposed 66-inch WSP (trenchless installation).
29	UT to Byers Ck. / **SCJ**	I	15	--	7	1:1	No	Channel change (w/ bank stabilization) – at outlet of proposed 36-inch WSP (trenchless installation).
30	Site 30 removed, per CP4C comments (no jurisdictional feature).							
31	UT to Byers Ck. / **SCD**	P	30	--	14	2:1	No	Channel change (w/ bank stabilization) – at outlet of proposed 48-inch WSP (trenchless installation).
32	UT to Byers Ck. / **SCA**	P	40	--	10	2:1	No	Channel change (w/ bank stabilization) – at inlet of proposed 48-inch WSP (trenchless installation).

Permit Site	Stream Name / ID[1/]	Stream Status[2/]	Permanent Channel Impacts (lf)	Bank Stabilization (lf)	Temp. Channel Impacts (lf)	ACOE Required Mitigation[3/]	DWR Required Mitigation[3/]	Permanent Impacts Description
33	UT to Byers Ck. / **SCA**	P	--	18	10	--	No	Bank stabilization – at outlet of proposed 24-inch RCP extension.
34	UT to Byers Ck. / **SCD**	P	--	10	10	--	No	Bank stabilization – at outlet of proposed 36-inch CSP.
35	UT to Byers Ck. / **SCG**	I	43	--	--	1:1	No	Proposed 30-inch CSP
			--	8	10	--	No	Bank stabilization – at outlet of proposed 30-inch RCP.
36	UT to Byers Ck. / **SCH**	I	10	--	10	1:1	No	Channel change (w/ bank stabilization) – at outlet of proposed 36-inch WSP (trenchless installation).
37	UT to Byers Ck. / **SCM**	I	22	--	10	1:1	No	* Channel change (w/ outlet protection) – at outlet of proposed 36-inch WSP (trenchless installation).
38	UT to Mud Creek/ **SBG**	P	--	39	10	--	No	Bank stabilization – at inlet to existing 7X7 RCBC.
39	UT to Mud Creek/ **SBF**	P	--	12	10	--	No	Bank stabilization – at confluence with SBG near inlet to existing 7X7 RCBC.
40	UT to Mud Creek/ **SBG**	P	--	48	--	--	No	Bank stabilization – at outlet of existing 7X7 RCBC.
41	UT to Mud Creek/ **SBI**	P	12	--	--	2:1	No	Proposed 66-inch WSP; trenchless installation (jack and bore).
			16	--	10	2:1	No	* Channel change – between inlet of existing 48-imch CMP and proposed WSP.
Total Streams Impact:			**716**	**921**	**343**			
Total Permanent Impacts:			**1,637**					
Total Stream Impact Requiring Mitigation (Total Perm. Impacts – Bank Stabilization):						**716†**		

1/ –Stream Number corresponds to I-4400/I-4700 PJD labeling.
2/ - I = Intermittent, P = Perennial.
3/ – USACE stream mitigation is taken from PJD Package, dated December 2013 and June 19, 2014. No mitigation is required for bank stabilization impacts; DWR mitigation ratio is 1:1 for impacts to perennial streams, when permanent impacts exceed 300 lf to a single feature.
* - outlet protection - riprap to be embedded.
† – Final mitigation requirement will be up to the USACE and DWR. Mitigation for 716 LF of permanent stream impact (at 2:1 ratio) has been obtained from DMS to compensate for impacts to I-4400BB.

Section I-4400C:

Table 7 – I-4400 C Wetland Impacts

Permit Site / Wetland ID[1/]	NC WAM Classification	Wetland Size (ac)	Perm. Fill in Wetlands (ac)	Excavation (ac)	Mechanized Clearing (ac)	Impact Description
5 / WBC	Headwater Forest	0.23	0.07	0.06	0.04	Impact to wetland due to road widening and for a proposed 2-foot Lateral Base Ditch.
			--	--	0.05	Indirect impact outside of Right of Way (Total Take).
8 / WBG	Headwater Forest	0.66	0.09	--	0.20	Fill in wetland due to road widening.
9 / WBI	Headwater Forest	0.68	--	--	0.02	Fill in wetland due to road widening.
13 / WBL	Headwater Forest	0.05	<0.01	--	--	Fill in wetland due to road widening.
15 / WBT	Headwater Forest	0.21	<0.01	<0.01	<0.01	Impact to wetland due to road widening and for proposed upstream culvert channel improvements.
16 / WBP	Bottomland Hardwood Forest	0.39	0.01	--	0.15	Fill in wetland due to road widening.
Totals by Impact Type [2/]:			**0.18**	**0.06**	**0.47**	
Total Permanent Wetland Impacts [2/]:			**0.71 [3/]**			

[1/] Wetland IDs correspond to I-4400/4700 PJD labeling;

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

[3/] Mitigation for 0.71 acres of wetland impacts has been obtained from DMS to compensate for wetland impacts on I-4400C.

Table 8 – I-4400C Stream Impacts

Permit Site	Stream Name / ID[1/]	Stream Status[2/]	Permanent Channel Impacts (lf)	Bank Stabilization (lf)	Temp. Channel Impacts (lf)	ACOE Required Mitigation[3/]	DWR Required Mitigation[3/]	Permanent Impacts Description
1	UT to Mud Creek/ **SCN**	P	197	--	10	1:1	N	Stream relocation – due to roadway widening, stream relocated to proposed 2-foot Lateral Base Ditch.
	UT to Mud Creek/ **SCK**	P	--	45	7	--	N	Bank stabilization at outlet of 60-inch RCP.
			30	--	--	2:1	N	Pipe extension – 60-inch RCP extension due to road widening.
2	UT to Mud Creek/ **SCK**	P	--	23	10	--	N	Bank stabilization at inlet of 60-inch CMP.
			58	--	--	2:1	N	Pipe extension – 60-inch CMP extension due to road widening.
	UT to Mud Creek/ **SCL**	P	126	--	10	2:1	N	Stream relocation – due to roadway widening, stream relocated to proposed 2-foot Lateral Base Ditch.
3	UT to Mud Creek/ **SCO**	P	--	12	--	--	N	Bank stabilization at outlet of existing 60-inch CMP
4	UT to Mud Creek/ **SCO**	P	--	--	8	--	N	Pipe extension - 60-inch RCP extension and Headwall due to road widening.
5	UT to Mud Creek/ **SEN**	P	353	--	--	2:1	Y	Stream relocation – due to roadway widening, stream relocated to proposed 2-foot Lateral Base Ditch.
	UT to Mud Creek/ **SCQ**	P	58	--	--	2:1	Y	Proposed 48-inch WSP with 48-inch RCP extension.
			26	--	10	2:1	Y	* Channel change – downstream of 48-inch RCP.
6	UT to Mud Creek/ **SCT**	P	316	--	10	2:1	Y	Stream relocation – due to roadway widening, stream relocated to proposed 2-foot Lateral Base Ditch.
7	UT to Mud Creek/ **SCR**	P	23	--	--	1:1	N	Stream relocation – due to roadway widening, stream relocated to proposed 2-foot Lateral Base Ditch.
			83	--	10	1:1	N	Pipe installation – proposed 42-inch RCP and 48-inch RCP.
	UT to Mud Creek/ **SCQ**	P	430	--	10	2:1	Y	Stream relocation – due to roadway widening, stream relocated to proposed 2-foot Lateral Base Ditch.

Permit Site	Stream Name / ID[1/]	Stream Status[2/]	Permanent Channel Impacts (lf)	Bank Stabilization (lf)	Temp. Channel Impacts (lf)	ACOE Required Mitigation[3/]	DWR Required Mitigation[3/]	Permanent Impacts Description
8	UT to Cane Ck/ **SCU**	I	47	--	--	1:1	N	Stream relocation – to upstream culvert channel, improvements with floodplain bench.
			32	--	--	1:1	N	Pipe extension – Upstream extension of existing 36-inch RCP due to roadway widening.
9	UT to Cane Ck/ **SCU**	I	37	--	--	1:1	N	Pipe extension – Downstream extension of existing 36-inch RCP due to roadway widening.
			--	29	--	--	N	Bank stabilization at outlet of proposed 36-inch RCP extension.
			15	--	8	1:1	N	Stream relocation – due to roadway widening, stream relocated to proposed 2-foot Lateral Base Ditch.
11	UT to Cane Ck/ **SCX**	P	13	--	11	2:1	Y	Stream relocation – to proposed channel change.
			--	53	--	--	N	Bank stabilization at beginning of channel change.
			682	--	--	2:1	Y	Stream relocation – to proposed channel change.
			18	--	--	2:1	Y	* Channel change – at outlet of proposed channel change.
12	Cane Creek	P	--	334	20	--	N	Bank stabilization – at bridge site.
13	UT to Kimsey Ck/ **SCZ**	P	--	32	--	--	N	Bank stabilization – at outlet of existing 2 @ 60-imch RCP.
14	Kimsey Creek / SCY	P	--	45	9	--	N	Bank stabilization – at outlet of proposed 3 @ 7X7 RCBC extension.
			48	--	--	2:1	N	Culvert extension - Proposed 3 @ 7X7 RCBC extension due to roadway fill.
16	UT to Kimsey Ck/ **SDR**	I	216	--	--	2:1	N	Stream relocation – due to roadway widening, stream relocated to proposed 2-foot Lateral Base Ditch.
	Kimsey Creek / **SCY**	P	22	--	--	2:1	N	Culvert extension - Proposed 3 @ 7X7 RCBC extension due to roadway fill.
			--	34	10	--	N	Bank stabilization – at inlet of proposed 3 @ 7X7 RCBC.

Permit Site	Stream Name / ID[1/]	Stream Status[2/]	Permanent Channel Impacts (lf)	Bank Stabilization (lf)	Temp. Channel Impacts (lf)	ACOE Required Mitigation[3/]	DWR Required Mitigation[3/]	Permanent Impacts Description
17	UT to French Broad River / **S1**	P	122	--	10	2:1	N	Pipe installation - Proposed 42-inch RCP.
18	UT to French Broad River / **SDH**	I	--	--	25	--	N	Construction of temporary roadway fill slope.
Total Streams Impact:			**2,952**	**607**	**178**			
Total Permanent Impacts:			**3,559**					
Total Stream Impact Requiring Mitigation (Total Perm. Impacts – Bank Stabilization):						**2,952†**		

1/ –Stream Number corresponds to I-4400/I-4700 PJD labeling.
2/ - I = Intermittent, P = Perennial.
3/ – USACE stream mitigation is taken from PJD Package, dated December 2013 and June 19, 2014. No mitigation is required for bank stabilization impacts; DWR mitigation ratio is 1:1 for impacts to perennial streams, when permanent impacts exceed 300 lf to a single feature.
* riprap to be embedded.
† – Final mitigation requirement will be up to the USACE and DWR. Mitigation for 2,952 LF of permanent stream impact (at 2:1 ratio) has been obtained from DMS to compensate for impacts to I-4400C.

Sections I-4700A & B:

A hydraulic analysis was performed at selected locations. It was determined that at several locations, the Welded Steel Pipe (WSP) could be eliminated and the existing pipe would provide an adequate hydraulic capacity with an "improved" tapered inlet used to increase the capacity of the pipe. The improved inlet acts as a funnel to provide a smoother transition from the channel into the pipe than can be obtained using an open-ended pipe or a standard headwall.

For the I-4700A&B sections of the project, the following locations were modified to eliminate the trenchless installation of a welded steel pipes:

- **Site 7 and Site 9:** The 36" WSP pipe shown in the permit plans has been eliminated and a tapered inlet and headwall has been added, the existing pipe will be lined and extended to the proposed fill slope. **Impacts have been revised at these sites.**
- **Site 21 and Site 22:** The 42" WSP pipe shown in the permit plans has been eliminated and a tapered inlet and headwall has been added, the existing pipe will be lined and extended to the proposed fill slope. **There are no changes in the impacts at these sites**.
- **Site 23 and Site 24:** The 48" WSP pipe shown in the permit plans has been eliminated and a tapered inlet and headwall has been added, the existing pipe will be lined and extended to the proposed fill slope. **Impacts have been revised at these sites.**
- **Site 26:** The 30" WSP pipe shown in the permit plans has been eliminated and the existing pipe will be lined. **Impacts have been revised at this site.**
- **Site 29:** The 24" WSP pipe shown in the permit plans has been eliminated and the existing pipe will be lined and extended to the proposed fill slope. **Impacts have been revised at this site.**
- **Site 30 and Site 31:** The 66" WSP pipe shown in the permit plans has been eliminated and the existing pipe will be lined and extended to the proposed fill slope. **Impacts have been revised at Site 30**.
- **Site 32 and Site 33:** The 36" WSP pipe shown in the permit plans has been eliminated and the existing pipe will be lined and extended to the proposed fill slope. **There are no changes in the impacts at these sites.**
- **Site 44 and Site 45:** The 54" WSP pipe shown in the permit plans has been eliminated and the existing pipe will be lined and extended to the proposed fill slope. **Impacts have been revised at these sites.**

Sites that have revised impacts are presented in Table 9, with revised Total Impacts and Impacts Requiring Mitigation presented at the bottom of table. There is a decrease in Total Impacts due to the pipe revisions, and at most of the sites the impacts have decreased; two sites have a slight increase: Sites 24 and 44. In a few instances the impacts did not change, which is primarily due to the fill slopes being the primary factor affecting impacts at these locations. Even at locations with no actual reduction in quantifiable impacts, the elimination of trenchless installation pipe locations will provide an environmental benefit by eliminating the grading required adjacent to the stream for bore pits and the floodplain benching which will reduce the time to construct the pipe extensions and stabilize the sites.

Table 9 – I-4700A & I-4700B Revisions to Stream Impacts

Permit Site	Stream Name / ID[1/]	Stream Status[2/] / Class	Permanent Channel Impacts (lf)		Permitted Bank Stabilization Impacts (lf)		Temp. Channel Impacts (lf)		Impact Description
			Permitted*	Revised	Permitted*	Revised	Permitted*	Revised	
7	UT to French Broad River/SDF	P / B	X	--	X	--	27	5	~~Pipe Extension – extension of existing (retained) 54" RCP.~~ Pipe liner revision: Temporary impact from constructing tapered inlet with Head Wall.
9	UT to French Broad River/SDF	P / B	30	20	X	--	X	--	Pipe extension - ~~extension of existing 54" RCP due to roadway widening, and energy dissipator pad at outlet.~~ Pipe liner revision: Existing 54" CMP to be retained and lined.
			X	--	12	22	11	--	Bank stabilization – at outlet of ~~proposed 54" RCP extension~~ existing 54" CMP.
23	UT to French Broad River/SDX	I / B	312	--	X	--	10	--	Stream relocation – stream relocated to lateral "V" ditch due to roadway widening.
			9	--	X	--	20	--	*Channel change – channel armoring at stream due to energy dissipation pad at outlet of proposed 30" stormwater CSP.
			62	59	X	--	10	--	~~Pipe placement – proposed 48" WSP with 48" RCB extension to fill slope to replace existing 42" CSP that will be abandoned (plugged and filled).~~ Pipe liner revision: Existing 42" CSP to be retained and lined.
24	UT to French Bro ad River/SDX	P / B	24	27	X	--	10	--	~~*Channel change – channel slightly shifted to align with outlet of proposed 48" WSP with 48" RCP extension, and channel armoring for outlet protection.~~ Pipe liner revision: Existing 42" CSP to be retained and lined.
26	UT to French Broad River/SDX	P / B	32	7	X	--	5	10	~~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.~~ Pipe liner revision: Existing 30" CSP o be retained and lined.
29	UT to French Broad River/SDX	P / B	X	--	X	--	30	--	Temporary impact for construction of a standard base ditch.
			7	0	X	--	20	0	~~*Channel change: at outlet of proposed 24" WSP w/ CSP extension.~~ Impact eliminated; 24" CSP being retained.

Permit Site	Stream Name / ID[1/]	Stream Status[2/] / Class	Permanent Channel Impacts (lf)		Permitted Bank Stabilization Impacts (lf)		Temp. Channel Impacts (lf)		Impact Description
			Permitted*	**Revised**	Permitted*	**Revised**	Permitted*	**Revised**	
30	UT to French Broad River/SDX	P / B	9	--	X	--	20	--	*Channel change – channel armoring at stream due to energy dissipation pad at outlet of proposed 24" stormwater CSP.
			9	--	X	--	20	--	*Channel change – channel armoring at stream due to energy dissipation pad at outlet of proposed 15" stormwater CSP.
			9	--	X	--	18	20	*Channel change – channel armoring at stream due to energy dissipation pad at outlet of proposed 15 stormwater CSP.
			77	**70**	X	--	10	--	~~Pipe – proposed 66" WSP w/ 66" RCP extension to replace adjacent 66" CMP that is to be abandoned (inlet end).~~ Pipe liner revision: Existing 66" CMP to be retained and lined.
44	UT to French Broad River / SFG	P / C	8	**15**	X	--	20	--	~~*Channel change – armoring channel at outlet of proposed 54" WSP with 54" RCP extension (replacing existing 48" CMP – to be abandoned), for energy dissipation~~. Pipe liner revision: Existing 48" CMP to be retained and lined.
45	UT to French Broad River / SFR	P / C	21	**0**	X	–	6	**5**	~~Stream relocation – to 4' standard base ditch, to align with inlet of proposed 54" WSP with 54" RCP extension.~~ Pipe liner revision: Existing 48" CMP to be retained and lined.
Streams Impact for I-4700A&B:			2,674	**2,611**	282	**292**	1,601	**1,565**	
Total Permanent Stream Impacts Permitted* / **Revised:**			2,956 / **2,903**						
Total Stream Impact Requiring Mitigation Permitted* / **Revised:**			2,674 / **2,611**						

* 404 Permit USACE Action ID: SAW-2013-01833; 401 WQC NCDWR Project No.: 20181645 Modification 2.

[1/] –Stream Number corresponds to I-4400/I-4700 PJD labeling.

[2/] - I = Intermittent, P = Perennial.

MORATORIUM

This project is located within a trout watershed. However, pursuant to the October 2, 2017 memo from WRC, there are no trout moratoria for this project, as noted in the original Phased IP Application.

FEDERALLY PROTECTED SPECIES

Formal Section 7 Consultation has been completed for the entire I-4400/I-4700 project after submittal of the original Phased IP Application. The USFWS issued a Biological Opinion (BO) (FWS Log #01-206), dated February 22, 2019, noting their concurrence with the Effects Determinations provided in the Biological Assessment, dated August 2018. The requirements under Section 7 of the Endangered Species Act have been fulfilled.

MITIGATION

The NCDOT has avoided and minimized impacts to jurisdictional resources to the greatest extent practicable. Avoidance measures were taken during the planning and NEPA compliance stages and minimization measurers were incorporated as part of the project design. In addition to the measures listed in the original Phased IP application, other specific examples of avoidance and minimization measures include:

Section I-4400BB:

- Rip Rap pads were used at pipes outlets throughout the project to reduce water velocities into wetlands and jurisdictional streams.
- The Sediment and Erosion Control Plan for I-4400BB 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.
- Post Construction Stormwater Program will be implemented throughout the I-4400BB corridor to the maximum extent practical.

Section I-4400C:

- Retaining walls were used in 2 locations to reduce the extent of impacts along the project corridor. Rip Rap pads were used at pipes outlets throughout the project to reduce water velocities into wetlands and jurisdictional streams.
- Special design "Concrete Energy Dissipators" were used at strategic locations (see SMP) where pipe outlets were adjacent to jurisdictional streams.
- The Sediment and Erosion Control Plan for I-4400C 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 has been implemented throughout I-4400C and the additional sections of the I-4400 corridor to the maximum extent practical.
- Special Design diches have been flattened from 2:1 to 3:1 in locations that do not require additional right of way. Due to the challenging terrain, some ditches included in the

"Swales" tab do not meet all the swale criteria but will provide some level of stormwater treatment.

- Rip rap pads are used at the outlets of pipes to dissipate energy and reduce velocity before entering a ditch or a stream; however, they are not designed as an HEC14 Rip Rap Energy Dissipator Basin per NCDOT Roadside Environmental Unit's request.
- Hazardous Spill Basins are included in the design to contain fuel spills from the truck parking lots at the two re-designed Rest Areas (see SMP).

Sections I-4700 A&B

- The elimination of some trenchless installation pipes will provide an environmental benefit by eliminating the grading required adjacent to the stream for bore pits, and the floodplain benching which will reduce the time to construct the pipe extensions and stabilize the sites.

Compensation:
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 impacts based on Final Design for sections I-4400BB (716 lf for stream, 0.05 ac. for wetlands) and I-4400C (2,952 for streams, 0.71 ac. for wetlands). Compensatory mitigation for I-4400A and I-4400BA, sections not yet in Final Design, will be provided accordingly during subsequent permit modifications.

REGULATORY APPROVALS

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

Section 401: We are hereby requesting a modification to the referenced 401 Water Quality Certification (WQC) from the N. C. Division of Water Resources. In compliance with Section 143 215.3D(e) of the NCAC, NCDOT will provide $570.00 to act as payment for processing the requested modification.

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.

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
TIM BAUMGARTNER
Director

NORTH CAROLINA
Environmental Quality

July 26, 2019

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

Dear Mr. Harris:

Subject: Mitigation Acceptance Letter:

I-4400BB, I-26 at US 64 (Exit 49) to US 25 Business (Exit 44), Henderson County

The purpose of this letter is to notify you that the Division of Mitigation Services (DMS) will provide the compensatory stream and wetland mitigation for the subject project. This letter replaces the letter issued on April 16, 2019. Based on the information supplied by you on July 25, 2019, the impacts are located in CU 06010105 of the French Broad River basin in the Southern Mountains (SM) Eco-Region, and are as follows:

French Broad 06010105 SM	Stream			Wetlands			Buffer (Sq. Ft.)	
	Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh	Zone 1	Zone 2
Impacts (feet/acres)	0	716	0	0.05	0	0	0	0

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

DMS commits to implementing sufficient compensatory stream and wetland 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 Beth Harmon at 919-707-8420.

Sincerely,

James B. Stanfill
DMS Asset Management Supervisor

cc: Mr. Monte Matthews, USACE – Raleigh Regulatory Field Office
Ms. Amy Chapman, NCDWR
File: I-4400BB Revised

ROY COOPER
Governor
MICHAEL S. REGAN
Secretary
TIM BAUMGARTNER
Director

NORTH CAROLINA
Environmental Quality

July 26, 2019

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

Dear Mr. Harris:

Subject: Mitigation Acceptance Letter:

I-4400CC, I-26 from US 25 Business (Exit 44) to NC 280 (Exit 40), Henderson County

The purpose of this letter is to notify you that the Division of Mitigation Services (DMS) will provide the compensatory stream and wetland mitigation for the subject project. This letter replaces the letter issued on April 16, 2019. Based on the information supplied by you on July 25, 2019, the impacts are located in CU 06010105 of the French Broad River basin in the Southern Mountains (SM) Eco-Region, and are as follows:

French Broad 06010105 SM	Stream			Wetlands			Buffer (Sq. Ft.)	
	Cold	Cool	Warm	Riparian	Non-Riparian	Coastal Marsh	Zone 1	Zone 2
Impacts (feet/acres)	0	2,952	0	0.710	0	0	0	0

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

DMS commits to implementing sufficient compensatory stream and wetland 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 Beth Harmon at 919-707-8420.

Sincerely,

James B. Stanfill
DMS Asset Management Supervisor

cc: Mr. Monte Matthews, USACE – Raleigh Regulatory Field Office
Ms. Amy Chapman, NCDWR
File: I-4400C Revised

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: February 13, 2019

Time: 10:00 a.m. to 12:00 p.m.

Place: NCDOT Century Center A, Structures Design Conference Room and Conference Call

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-4400 C and BB

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
Jay Mays	USFWS	jason_mays@fws.gov	828-258-3939
Claire Ellwanger	USFWS	claire_ellwanger@fws.gov	828-258-3939
Lyuba Zuyeva*	French Broad River MPO/Land of Sky	lyuba@landofsky.org	828-251-7454
Robert Patterson	NCDEQ-DWR	robert.patterson@ncdenr.gov	919-707-3880
Kevin Barnett*	NCDEQ DWR	kevin.barnett@ncdenr.gov	828-296-4657
Marla Chambers	NCWRC	marla.chambers@ncwildlife.org	704-244-8907
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

Name	Agency	Email address	Phone
Josh Gillet	NCDOT – Location and Surveys	jgillett@ncdot.gov	828-586-0925
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
Katina Lucas	NCDOT – STIP	ktlucas@ncdot.gov	919-707-4632
Kat Bukowy	HNTB	kbukowy@hntb.com	919-424-0441
Matt Foster	HNTB	mfoster@hntb.com	919-424-0460
Joe Olson*	HNTB	jsolson@hntb.com	919-424-0480
John Blancett	HNTB	jblancett@hntb.com	816-527-2539
Kevin Higgins	Parrish and Partners	khiggins@parrishandpartners.com	980-819-0439
Jon Ford	Vaughn and Melton	jcford@vaughnmelton.com	843-469-4561
Reece Schuler	Vaughn and Melton	rmschuler@vaughnmelton.com	704-357-0488

*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-4400C and BB portions of the project. I-4400C extends from US 25 (Asheville Highway) to NC 280 (Airport Road) and is part of the 8-lane widening portion of the Preferred Alternative. I-4400BB extends from US 64 (Four Seasons Boulevard/Chimney Rock Road) to US 25 (Asheville Highway) and will be widened to six lanes. HNTB is responsible for the development of the I-4400C hydraulic designs; I-4400BB hydraulic designs are being developed by Vaugh and Melton and Parrish and Partners.

The Team reviewed the plan sheets (PS) for I-4400C and had the following comments:

PS 4 – Stream SCL needs to be labeled. The Site numbers need to be split up per individual feature. Site 2, SCI, should be removed.

Stream SCL was added, and SCI was removed

Site Numbers have not been renumbered per feature due to the rush to implement design changes in advance of the March meeting submittal dates and to remain consistent with the 4B plans.

PS 5 – Does Site 4 include bank stabilization? Can stormwater treatment be included in the base ditch?

Bank stabilization is not required since the existing pipe will be lined and remain the primary conveyance. The headwall will be extended to accommodate the supplemental (high flow) pipe.

The grass lined ditch will provide some stormwater treatment but does not meet the side slope requirements to be a grass swale. Flattening the side slopes would require additional R/W.

PS 6 – Lori Beckwith (USACE) asked if a ditch will impact a wetland, how does it affect the entire wetland. Site 5, WBC, is considered a total take. HNTB will look at whether toe protection can be used instead of a ditch at Site 5. Dave McHenry (NCDOT) suggested raising the invert to not drain the wetland. There may be some opportunity for stormwater treatment. On Site 5, SCQ, HNTB will look determine if rip rap is necessary in the stream or if it is just bank stabilization. Kevin Barnett (DWR) asked why there is rip rap at all.

Site 5. Toe protection would not be effective based on the high flow in the ditch below the 36" pipe and the ditch velocity exceeds the maximum for grass lining. The intersection of the ditch near the outlet of the 48" cross pipe would be susceptible to scour which is why embedded (or keyed-in rip rap is recommended in the channel along with bank stabilization.

PS 8 – Site 8, WBG would be a total take because of the ditch running through it, this may be another opportunity for stormwater treatment. Site 9, SCU, evaluate outlet velocity and flow from the pie for stream scour to determine if rip rap is needed in the stream and call it out separately, if required, from rip rap used for bank stabilization.

Site 8 We removed the ditch running through the wetland. US Ditch was flattened out to 3:1 side slopes to perform as a grass swale. Site 8 would be impacted by fill and mechanized clearing but would not be considered a total take. Additionally at Site 8 the two pipe outlets at WBL (north side at 719+60 and 723+60 we added concrete energy dissipators to remove energy and slow the velocity of water before entering the wetland.

Site 9, SCU, evaluate outlet velocity and flow from the pie for stream scour to determine if rip rap is needed in the stream and call it out separately, if required, from rip rap used for bank stabilization.

Site 9- Removed the rip rap in the stream. Just used bank stabilization.
In addition, the ditch from 719+50 LT (EBL or South Side) to 727+00 at Site 9 was flattened to 3:1 slopes (grass lined) as it fit within the existing R/W.

PS 11 – Site 10 labels need to be closer to the impact.

Comment incorporated

Site 11 is a channel change, Stream SCX will be moved into a ditch. Kevin asked if the quantity of rip rap shown is necessary.

Site 11 to 12—Reevaluated the ditch removed the majority of the Rip Rap and used a grass liner.

Site 12- Added additional Bank Stabilization at proposed piers for the Cane Creek Bridge due to the proximity of the bent to the top of bank.

PS 12 – Site 13 evaluate outlet velocity and flow form the pipe for scour to determine if rip rap is needed in the stream and call it out separately, if required, from rip rap used for bank stabilization. Site 16 labels need to be moved to the appropriate wetland (move up). If WBP is not a total take, it will need to be explained as to why. The addition of the 30" welded steel pipe to the ditch on the east side of I-26, north of Kimsey Creek, design has changed.

Site 13—Rip Rap removed from the stream bed, just used bank stabilization-

Site 16 Removed the ditch running through the wetland. Site 16 will still be impacted by fill and mechanized clearing but by removing the ditch it will not dewater the WLB area outside the R/W. Additionally, the pipe outlet at WBL (north side at 766+80) a concrete energy dissipator was added to remove energy and slow the velocity of water before entering the wetland

PS 14 – Site 18 needs to show all impacts. Rest Areas are not part of the linear project. All stormwater treatment needs to be shown on the permit drawings.

Site 17 Shows the proposed Rest Areas (designed by REU) and the associated pipe network. Stream S1 is impacted by the 42" outlet pipe. Hazardous Spill Basins were added to provide spill protection from the truck parking areas.

PS 18 – Label Stream SCO as a JS, there does not appear to be an impact to this stream.

Site 19 (in the CB4B plans) on PSH 18 does not have any impact to the JS and was removed from the Permit Plan set

PS 21 – Site 20 should show a pipe extension. This may also need to be changed on stream SCR (PS 19, not included).

On PSH 21 (Old Site 20) which is now Site 18 – has been regraded and the cross section adjusted so that the pipe extension is not required. A temporary Stream impact was added due to the placing the fill adjacent to the end of the existing pipe.

Lyuba Zuyeva (FBRMPO) asked if Butler Bridge Road would be closed while the bridge is replaced. *The bridge road will be closed while the bridge is replaced. A detour route will be provided.*

Kevin requested that any opportunities for post-construction stormwater be addressed.

Several ditches were revised to meet grass swale standards and concrete energy dissipators

Next, the Team reviewed the I-4400BB 30 percent hydraulic design (PS numbering started over) and had the following comments:

PS 5 – Site 1, an energy dissipater is recommended at the pipe outlet. Bank stabilization needs to be labeled on the plans. Structure 501 needs to be reviewed for slope steepness.

Drop structure has been added at the pipe outlet to address slope and energy dissipation. Bank stabilization labeled on the plans

From PS 5 onward, the NEU line needs to be turned off. Lori also requested that some of the additional layers also be turned off or made less obvious (e.g. topography).

NEU line turned off. Levels have been turned off and plans cleaned up

PS 7 – Site 6, Kevin asked if the pipe goes all the way to the end of the fill slope.

Pipe outlets into the floodplain of Clear Creek at the end of the existing fill slope.

PS 9 – Structure 922 needs to be reviewed.

Structure 0922 was shifted to outlet into the existing stream. Site number and impacts have been added.

PS 13 – Site 9, WAH and WAM are total takes, as is Site 10, WAP. Make sure Class B rip rap is adequate.

Class B Rip Rap at 15" outlet is adequate. Class I Rip Rap has been utilized at the outlet of the 36" Cross Pipe

PS 14 – Sites 11 and 12, show culvert extension with bank stabilization.

Culvert extension and bank stabilization has been shown

PS 18 – Review whether or not WAT is a total take.

WAT is not a total take

PS 19 (1st) – Site 20 label needs to be moved. Site 19 is an extension of the double barrel box culvert, one barrel is in the floodplain, the other is the bench. No rip rap will be in the stream but needs to be shown as bank stabilization.

Site 20 label was moved closer to the site. Bank stabilization has been shown

PS 19 (2nd) – Site 20 will need to be renumbered and shown as rip rap bank stabilization and imbedded in the stream.

Sites have been renumbered and shown as rip rap banks only.

PS 21 – Delete Sites 23, 24, and 25 because they have no impacts. Site 22 needs to show rip rap is imbedded as well as for bank stabilization.

Comment addressed. Site shows rip rap imbedded and bank stabilization

PS 22 – Site 28 will be a blind junction box and rip rapped channel. Site 29, SCG labels need to be moved and the plans show that the rip rap will be imbedded in the stream.

Blind JB label added. Old site 28 (now Site 32) shows rip rap banks only since JS stream. SGC label moved closer to the site and plans changed to call for rip rap bank stabilization only.

PS 23 – WAY wetland label needs to be shifted to the wetland (no impacts therefore no site number). The JS stream that the WAY label is over needs to be verified. Site 32 SCM shows bank stabilization. The Site 31, SCN label needs to be moved and shown as bank stabilization. Stream SCH should be labeled near structure 2332.

Wetland WAY is shown on the plans in blue, but it does not have a label since the site is not impacted. The stream that was shown near the wetland is not JS and was removed from the plans. Old Site 32 (new site 36) shows bank stabilization only.

Old Site 31 is not a JS stream, so label was removed.

Stream SCH was labeled near structure 2332 and numbered site 35.

Following the plan sheet review, Matt Foster (HNTB) returned to Plan Sheet 7, which shows Clear Creek and Allen Branch. He explained the current concerns of NCDOT Geotech of putting a retaining wall on a 1.5:1 slope, which would require either fill in Allen Branch or a channel change (realignment) of Allen Branch. Lori asked how wide Allen Branch is and it is 14'. There is also an issue of constructability and needing an access road to build the I-26 over Clear Creek bridge. The design team was asked to look at the downstream effects to Clear Creek if it is necessary to realign Allen Branch. Lori also requested the design team look at the use of non-standard techniques to build the Clear Creek bridge that would not affect Allen Branch.

The proposed retaining wall on approach to the Clear Creek Bridge has been designed so that impacts will be minimized to Allen Branch. Relocation of Allen Branch will not be required however bank stabilization will be needed to stop the migration of the bend in Allen Branch toward the fill slope.

Lyuba asked if the Clear Creek bridge would accommodate Hendersonville Greenway and Kat indicated that it would.

I-26 Widening

STIP Project Nos. I-4400 & I-4700

Section 404/NEPA Merger Meeting

Concurrence Point 4C

April 10, 2019

US 64 (Exit 49) in Henderson County to US 25 (Exit 44) in Buncombe County including Blue Ridge Parkway Bridge over I-26

Meeting Date: April 10, 2019

Time: 10:00 a.m. to 12:00 p.m.

Place: NCDOT Century Center A, Roadway Design Conference Room and Conference Call

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) 4C, Final Permit Drawings, for I-4400BB

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
Jay Mays	USFWS	jason_mays@fws.gov	828-258-3939
Claire Ellwanger	USFWS	claire_ellwanger@fws.gov	828-258-3939
Lyuba Zuyeva*	French Broad River MPO/Land of Sky	lyuba@landofsky.org	828-251-7454
Robert Patterson	NCDEQ-DWR	robert.patterson@ncdenr.gov	919-707-3880
Kevin Barnett*	NCDEQ DWR	kevin.barnett@ncdenr.gov	828-296-4657
Marla Chambers	NCWRC	marla.chambers@ncwildlife.org	704-244-8907
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
David McHenry	NCDOT – Division 14	dgmchenry@ncdot.gov	828-586-4043
Josh Gillet*	NCDOT – Location and Surveys	jgillett@ncdot.gov	828-586-0925
Bill Barrett	NCDOT – Natural Environment Section	wabarrett@ncdot.gov	919-707-6103

Name	Agency	Email address	Phone
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
Katina Lucas	NCDOT – STIP	ktlucas@ncdot.gov	919-707-4632
Kat Bukowy	HNTB	kbukowy@hntb.com	919-424-0441
Matt Foster	HNTB	mfoster@hntb.com	919-424-0460
Joe Olson*	HNTB	jsolson@hntb.com	919-424-0480
John Blancett*	HNTB	jblancett@hntb.com	816-527-2539
Kevin Higgins	Parrish and Partners	khiggins@parrishandpartners.com	980-819-0439
Jon Ford	Vaughn and Melton	jcford@vaughnmelton.com	843-469-4561
Beverly Robinson	NCDOT - PMU	brobinson@ncdot.gov	919-707-6041
Derrick Weaver	NCDOT - EPU	dweaver@ncdot.gov	919-707-6601
Doug Askew	NCDOT - Right of Way	daskew@ncdot.gov	252-355-9059
Steve Grimes	NCDOT - Right of Way	sgrimes@ncdot.gov	919-707-4366
Neal Strickland	NCDOT - Right of Way	nstrickland@ncdot.gov	919-707-4364
Jeff Hess	HNTB	jhess@hntb.com	704-208-5363
Randy Henegar	TGS Engineers	rhenegar@tgsengineers.com	
Victor Barbour	Vaughn and Melton	jvbarbour@vaughnmelton.com	919-977-9455

*attended by phone

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. Jon Ford (Vaughn and Melton) began with a review of the Avoidance and Minimization Measures taken to date. Below is a list of action items to be addressed:

- *Add all sites to title sheet*

Sites have been added to the title sheet

- *Add legend to all sheets*

Legend was added to all sheets

- *Show permanent impacts on sheet 12*

Permanent impacts have been added to sheet 12

- *Update hatching for temporary impacts*

Hatching for temporary impacts has been updated

- *Fish passage for future pipes*

Fish passage for future pipes was considered and effort was made to maintain fish passage where possible

- *Base flows through barrel*

The base flow of the major culverts will flow through the main barrel and supplemental pipes convey additional flow. Culvert extensions will not alter the base flow

- *Follow up regarding steep slope for pipe with drop structure*

Slope of proposed 48" pipe with drop structure maintains slope of the existing 42" pipe to be plugged and abandoned. Existing pipe also was perched 10' above the stream. Drop structure added to address potential erosion issues

- *Check the velocity at the end of rip rap at the end of 0501*

Velocity at end of rip rap sufficient for stable outlet discharge to outfall

- *Revise permit drawing sheets 9 -12 for bank stabilization*

Bank stabilization has been called out and detail referenced on permit drawing sheets 9-12

- *Update sheet x of x and note sheets 14 – 17*

Notes have been revised to reference the correct sheet number

- *Rip Rap for path 10' wide to allow animal passage. Max slope allowed for fish passage – 3% per agency*

10' path shown in profile to allow animal passage

- *Label 14' for greenway path on sheets 14 – 17*

14' greenway path has been labeled on permit drawing sheets

- *Add wetland impact hatching to legend on sheets 13 and 18*

Wetland impact hatching has been added to the legends

- *Call out soil choking on plans*

Soil choking has been called out on plans

- *Site 7 temp impacts not called out*

Temporary impacts have been called out at site 7

- *Add site 6 to the top*

Site 6 has been added to the top of the clear creek impacts

- *Combine site 6 and 8 and double check numbers for stream impacts. Double counting on the left and right banks are not needed. Call out left and right bank lengths on plans and any full-length number on the impact summary sheet.*

Site 6 and 8 have been combined. Left and right bank lengths called out on plans and the full-length number has been calculated on the impact summary sheet without double counting the left and right banks

- *Check the historic properties in the general area of sheets 10 and 11*

Easements in this area have been eliminated to stay off of the historic properties

- *Remove mechanized clearing in wetlands impact on site 13*

Mechanized clearing in wetlands impact has been removed and only excavation in wetlands is shown

- *Add culvert impact callouts on sheet 14*

Culvert impact callouts have been added

- *Change channel change note to bank stabilization for site 17 on sheet 16*

Note has been changed to bank stabilization at site 17

- *Add detail for impacts at site 19*

Detail added and called out at site 19

- *Revise callout arrow on sheet 18 to point to wetland impact*

Arrow has been revised to point to wetland impact

- *Add channel change impact at site 41 to impact summary sheet*

Channel change impact has been added to summary sheet

- *Add site number label to sheet 18*

Site 41 label added sheet 18

- *Add detail for all sites requiring embedded rip rap at outlet*

Details added for all sites requiring embedded rip rap

- *Add perennial and intermittent dashes to P&P plans*

Perennial and intermittent dashes added to P&P plans

- *Check the entire impact summary sheet and labels on drawings*

Impact summary sheet and labels have been checked

- *Add easements for any temporary impacts outside of Right of Way*

Easements for temporary impacts outside of Right of Way have been added

- *Show impact hatching and rip rap for all major structures*

Impact hatching and rip rap has been shown for all major structures

- *Add Bank Stabilization impact for 48" RCP at Site 1 on summary sheet*

Bank Stabilization impact has been added

- *Revise Site 21 Wetland ID to show WAT on summary sheet*

Site 21 wetland ID has been revised to show WAT

- *Revise sites 23 and 24 to show Byers Creek on Summary sheet*

Sites 23 and 24 have been revised to show Byers Creek

I-26 Widening

STIP Project Nos. I-4400C

Section 404/NEPA Merger Project

Team Meeting Concurrence Point 4C

Permit Plans Review

I-26 Between US 25 (Asheville Highway) To South of NC 280

Meeting Date: March 21, 2019
Time: 3:00 p.m. to 5:00 p.m.
Place: NCDOT Century Center A, Structures Design Conference Room C (Cap 40) and Conference Call
Project: I-26 Widening in Henderson and Buncombe Counties, Federal Aid Project No. NHG-36-1(63)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) 4C, Final Permit Drawings, for I-4400C.

Meeting Attendees:

Name	Agency	Email address	Phone
Loretta Beckwith*	USACE	loretta.a.beckwith@usace.army.mil	828-271-7980 x4223
Claire Ellwanger*	USFWS	claire_ellwanger@fws.gov	828-258-3939
Kevin Barnett*	NCDEQ DWR	kevin.barnett@ncdenr.gov	828-296-4657
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
Mike Patton*	NCDOT – Division 14	mdpatton@ncdot.gov	
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
Mark Staley	NCDOT – Roadside Environmental	mstaley@ncdot.gov	919-707-6110
Randy Henegar	TGS	rhenegar@tgsengineers.com	919-773-8887
LeiLani Paul	NCDOT	lpaugh@ncdot.gov	919-707-6146
Kevin Higgins	Parrish and Partners	khiggins@parrishandpartners.com	980-819-0439
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
Jordan Zacny	HNTB	jzacny@HNTB.com	816-527-2300

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. She stated that the project will stretch 3.5 miles on I-26. It will begin at end of I-4400BB construction, end at the beginning of I-4700 construction and will tie in to both projects. This project contains 2 major hydraulic structures: one bridge over Cane Creek and one culvert at Kimsey Creek. The I-4400BB Permit plans will be presented in April by Vaughn and Melton and Parrish and Partners.

Matt Foster (HNTB) Provided a brief update of plan revisions that have occurred after the CP4B meeting in January:

- A total of 20 potential sites were presented at CP4B which has now been reduced to 18 sites and one site is a temporary stream impact due to adjacent construction.
- Design Revisions included reevaluating and minimizing the use of rip rap in ditches and in stream beds when warranted. Implemented more coir fiber and grass lined ditches.
- Flattened the side slopes of ditches from 2:1 to 3:1 in locations where they fit within the right of way limits.
- Minimized or removed some of the ditches previously shown in wetlands.
- Added Concrete Energy Dissipators at several pipe outlets where steep pipes are located near wetlands to reduce the velocity of the water.

A total of 18 permit sites were reviewed by the team with discussion points summarized herein.

Site 4 – Bill Barrett (NCDOT – EAU, ECAP) recognized that there were no impacts to stream SCP at Site 4 and requested that the callout on Plan Sheet (PSH) 5 be removed.

Stream SCP was removed form PSH 5

Site 5 – Bill noted that wetland at Site 5 will be a total take. There were some questions about how to depict and quantify the take and Lori Beckwith (USACE) mentioned that she would discuss with Bill the best way to account for this.

Wetland is shown as a total take. Additional area includes Indirect Wetland Impact Outside the Right of Way which is quantified separately on the Impact Summary Sheet.

Site 8 – Mark Staley (NCDOT-REU) recognized that the shape and hatching for the “Mechanized Clearing in Wetland” and “Fill in Wetland” had been shifted and did not align with the roadway fill slope on PSH 8. It was requested to fix the shape to accurately represent the Impact.

The shape and hatching were adjusted to align with the slope stake line.

Bill Barrett asked to move the concrete dissipator, on PSH 9, inside of the fill slope and to place the rip-rap just outside of the fill slope.

The concrete energy dissipator was moved into the fill slope as far as possible to minimize impact to the wetland.

There was concern about the flow at the proposed headwall blocking the fish passageway due to the extension of the existing 36'' RCP. Matt Foster (HNTB) assured that the new 36'' WSP would be 1 foot lower than the existing pipe to provide for low flow.

Site 12 – Lori stated that the bank stabilization for Site 12 would not require Geotextile Fabric and requested that it be removed from the quantities and from detail YY (PSH 2-DI).

The geotextile fabric was removed from the quantities and detail YY.

Site 13 – Randy Henegar (TGS) pointed out missing rip-rap at the outlet of the 60'' RCP pipes. Randy also pointed out that the line styles in the downstream channel improvement shape should mimic the upstream line styles.

The rip rap was added at the outlet and the rip rap hatching was adjusted to match.

Bill Barrett noticed that a small portion of wetland would be impacted and had not been included in the current hatching shape. It was asked to adjust shape to account for this impact. Lori asked about monitoring areas during post construction (3-4 yrs) where a total take is questionable.

Fill in Wetland for WBL was added to PSH 12 and added to the Impact Summary Sheet.

Site 16 – Matt pointed out that the portion of the ditch that previously affected the wetland at Site 16 was removed.

Bill asked that the energy dissipator be moved to inside the fill slope and to adjust the hatching for mechanized clearing accordingly. Bill also pointed out that the Bank Stabilization callout referenced the wrong detail. It should be detail AAA instead of YYY.

The concrete energy dissipator was moved into the fill slope as far as possible to minimize impact to the wetland and the Bank Stabilization Detail was corrected to show AAA instead of YYYY.

SMP Form – Randy noted to discuss the hazardous spill basins for the Rest Areas in the project narrative.

The SMP form was updated to include the hazardous spill basins in the project narrative.

Wetland and Surface Water Impact Summary Sheet – Kat mentioned that site 8 and 9 had the wrong stream name. The correct stream name is Cane Creek, not Mud Creek.

Sites 8 and 9 in the Wetland and Surface Water Impacts Summary were adjust to reference Cane Creek.

Bill mentioned that since Site 18 is not in wetland, there should not be any values for Excavation or Mechanized clearing column.

Values for Excavation and Mechanized clearing were removed from the Wetland and Surface Water Impacts Summary for Site 18.

Action Items

- HNTB to address comments and update the plan set and impact summary sheets.
- Bill will have a discussion with Lori on how to depict and calculate the amount of take outside of the right of way.
- A decision will need to be made about if and how to monitor areas during post construction where a total take is questionable.

Hydraulic Analysis to Reduce the number of Trenchless Pipe Installations

NCDOT asked HNTB to evaluate several locations where welded steel pipes (WSP) were proposed to be installed using trenchless installation (bore and jack) to replace or supplement existing pipes. Due to the amount of large rock that are present in the existing roadway embankment, NCDOT anticipates that trenchless installation of pipes will be difficult, costly and take additional time if large rock is encountered during the boring operation.

A hydraulic analysis was performed at selected locations at it was determined that at several locations the WSP could be eliminated and the existing pipe would provide an adequate hydraulic capacity with an "improved" taped inlet used to increase the capacity of the pipe. The improved inlet acts as a funnel to provide a smoother transition from the channel into the pipe than can be obtained using an open-ended pipe or a standard headwall.

For the I-4400C section of the project, two pipe crossing locations were modified to eliminate the trenchless installation of a welded steel pipes

Site 1 and Site 2 – The 42" WSP pipe shown in the permit plans provided at the CP4C meeting has been eliminated and a tapered inlet and headwall was added to the existing pipe.

Site 3 and Site 4 – The 30" WSP pipe shown in the permit plans provided at the CP4C meeting has been eliminated and a tapered inlet and headwall was added to the existing pipe.

These changes did not change the reported stream impact numbers since the pipes that were eliminated were supplemental to existing pipe and not in the stream, however they will provide an environmental benefit by eliminating the grading required adjacent to the stream for bore pits and the floodplain benching which will reduce the time to construct the pipe extensions and stabilize the sites.

Please fill out all yellow cells as completely as possible. Use pick lists where provided. For more information on the NCDOT Stormwater Management Plan form, please refer to the document, NCDOT Stormwater Best Management Practices Toolbox (2014).
If the project drains to multiple water bodies, please drag the print area down such that Water Bodies 2 through 6 print on Page 2

North Carolina Department of Transportation

Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

General Project Information

WBS Element:	34232.1.6	**TIP Number:**	I-4400BB	**Project Type:**	Roadway Widening	**Date:**	7/12/2019
NCDOT Contact:	Wanda H. Austin, PE CPM			**Contractor / Designer:**	Jon Ford, PE		
Address:	253 Webster Road Sylva, NC 28779			**Address:**	1800 Associates Lane, Suite E Charlotte, NC 28217		
Phone:	828-586-2141			**Phone:**	704-357-0488		
Email:	whaustin@ncdot.gov			**Email:**	jcford@vaughnmelton.com		
City/Town:	Hendersonville			**County(ies):**	Henderson		
River Basin(s):	French Broad			**CAMA County?**	No		
Wetlands within Project Limits?	Yes						

Project Description

Project Length (lin. miles or feet):	5.11	**Surrounding Land Use:**	Suburban
	Proposed Project		**Existing Site**
Project Built-Upon Area (ac.)	ac.		ac.
Typical Cross Section Description:	6-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: 117,900 Year: 2040		Existing: 72,000 Year: 2019
General Project Narrative: (Description of Minimization of Water Quality Impacts)	I-4400BB involves the widening of Interstate I-26 from a 4-lane, median-divided facility to a 6-lane, median-divided facility from US 64 (Chimney Rock Road) to a point approximately 1,000 ft west of Naples Road (SR 1534), allowing it to tie into STIP Project I-4400C. 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 a 6-lane, median-divided facility consisting of 12-foot travel lanes with paved median. Jurisdictional features including wetlands and streams and a crossing of Clear Creek 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. Rip Rap pads were used at pipes outlets throughout the project to reduce water velocities into wetlands and jurisdictional streams. The Sediment and Erosion Control Plan for I-4400BB 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. Post Construction Stormwater Program will be implemented throughout I-4400BB and the additional sections of the I-4400 corridor to the maximum extent practical.		

Waterbody Information

Surface Water Body (1):	SAZ - UT to Cherry Branch		**NCDWR Stream Index No.:**	6-55-11-15	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SAZ			**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: 34232.1.6 **TIP No.:** I-4400BB **County(ies):** Henderson

Additional Waterbody Information

Surface Water Body (2):	SBA - UT to Cherry Branch		**NCDWR Stream Index No.:**	6-55-11-15	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SBA			**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):	SBC - Allen Branch		**NCDWR Stream Index No.:**	6-55-11-14	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SBC			**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):	SBD- Clear Creek		**NCDWR Stream Index No.:**	6-55-11-(5)	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SBD			**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)					

Surface Water Body (5):	SBE - UT Tributary to Clear Creek		**NCDWR Stream Index No.:**	6-55-11-(5)	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SBE			**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: 34232.1.6 **TIP No.:** I-4400BB **County(ies):** Henderson

Additional Waterbody Information

Surface Water Body (6):	SBF - UT Tributary to Mud Creek		**NCDWR Stream Index No.:**	6-55	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SBF			**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):	SBG - UT Tributary to Mud Creek		**NCDWR Stream Index No.:**	6-55	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SBG			**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):	SBH - UT Tributary to Mud Creek		**NCDWR Stream Index No.:**	6-55	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SBH			**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):	SBI - UT Tributary to Mud Creek		**NCDWR Stream Index No.:**	6-55	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SBI			**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: 34232.1.6 **TIP No.:** I-4400BB **County(ies):** Henderson

Additional Waterbody Information

Surface Water Body (10):	SBY - UT Tributary to Mud Creek		**NCDWR Stream Index No.:**	6-55		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SBY			**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):	SBO - UT Tributary to Mud Creek		**NCDWR Stream Index No.:**	6-55		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SBO			**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):	SBP - Featherstone Creek		**NCDWR Stream Index No.:**	6-55-12		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SBP			**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):	SBQ - UT Tributary to Mud Creek		**NCDWR Stream Index No.:**	6-55		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SBQ			**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: 34232.1.6 **TIP No.:** I-4400BB **County(ies):** Henderson

Additional Waterbody Information

Surface Water Body (14):	SBR - UT To Mud Creek		**NCDWR Stream Index No.:**	6-55		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SBR			**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):	SBS - UT To Mud Creek		**NCDWR Stream Index No.:**	6-55		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SBS			**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):	SBT - UT TO Byers Creek		**NCDWR Stream Index No.:**	6-55-13		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SBT			**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):	SBU - Byers Creek		**NCDWR Stream Index No.:**	6-55-13		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SBU			**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: 34232.1.6 **TIP No.:** I-4400BB **County(ies):** Henderson

Additional Waterbody Information

Surface Water Body (18):	SBV - UT to Byers Creek		**NCDWR Stream Index No.:**	6-55-13	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SBV			**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):	SBX - UT to Mud Creek		**NCDWR Stream Index No.:**	6-55	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SBX			**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):	SBN - UT to Mud Creek		**NCDWR Stream Index No.:**	6-55	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SBN			**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):	SBZ - UT to Mud Creek		**NCDWR Stream Index No.:**	6-55	
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C		
		Supplemental Classification:	None		
Other Stream Classification:	None				
Impairments:	None				
Aquatic T&E Species?	No	Comments:			
NRTR Stream ID:	SBZ			**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: 34232.1.6 **TIP No.:** I-4400BB **County(ies):** Henderson

Additional Waterbody Information

Surface Water Body (22):	SFW - Mud Creek		**NCDWR Stream Index No.:**	6-55		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SFW			**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 (23):	SCB - UT to Byers Creek		**NCDWR Stream Index No.:**	6-55-13		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SCB			**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 (24):	SCJ - UT to Byers Creek		**NCDWR Stream Index No.:**	6-55-13		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SCJ			**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 (25):	SCA - UT to Byers Creek		**NCDWR Stream Index No.:**	6-55-13		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SCA			**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: 34232.1.6 **TIP No.:** I-4400BB **County(ies):** Henderson

Additional Waterbody Information

Surface Water Body (26):	SCD - UT to Byers Creek		**NCDWR Stream Index No.:**	6-55-13		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SCD			**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 (27):	SCG - UT to Byers Creek		**NCDWR Stream Index No.:**	6-55-13		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SCG			**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 (28):	SCH - UT to Byers Creek		**NCDWR Stream Index No.:**	6-55-13		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SCH			**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 (29):	SCM - UT to Byers Creek		**NCDWR Stream Index No.:**	6-55-13		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class C			
		Supplemental Classification:	None			
Other Stream Classification:	None					
Impairments:	None					
Aquatic T&E Species?	No	Comments:				
NRTR Stream ID:	SCM			**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)						

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

WBS Element: 34232.1.6 **TIP No.:** I-4400BB **County(ies):** 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	-Y2- Sta. 24+80 RT 35.3542, -82.4545	(5)SBE - UT Tributary to	2.0	2.0	2.0	0.7	70	285	7.00%	1.7	1.1	2.4	1.3	No	No
14	-L- Sta. 526+05 LT 35.3724, -82.4728	(12)SBP - Featherstone	2.0	3.0	3.0	0.6	60	140	0.97%	1.3	0.4	1.8	0.5	No	No
14	-L- Sta. 525+60 RT 35.3727, -82.4722	(12)SBP - Featherstone	2.0	3.0	3.0	0.8	80	130	1.43%	1.8	0.6	2.5	0.7	No	No
16	-L- Sta. 552+00 LT 35.3774, -82.4790	(11)SBO - UT Tributary to	0.0	2.0	2.0	0.9	90	120	7.20%	3.2	2.1	4.4	2.4	No	No
18	-L- Sta. 573+80 RT 35.3813, -82.4844	(15)SBS - UT To Mud	2.0	2.0	2.0	14.5	1450	150	1.10%	26.0	2.4	35.2	2.7	No	No

Additional Comments

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

WBS Element: **TIP No.:** I-4400BB **County(ies):** Henderson

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?
7	-L- Sta. 419+70 RT 35.3493, -82.4518	(3)SBC - Allen Branch	Riprap Energy Dissipator Basin	Class I	8.7	Pipe	30	28.0	3.5	N/A
7	-L- Sta. 421+98 RT 35.3497, -82.4524	(4)SBD- Clear Creek	Riprap Energy Dissipator Basin	Class I	1.6	Pipe	15	7.1	2.5	N/A
10	-L- Sta. 456+25 LT 35.3577, -82.4583	(10)SBY - UT Tributary to	Riprap Energy Dissipator Basin	Class I	7.1	Pipe	30	24.0	3.3	N/A
10	-L- Sta. 456+72 LT 35.3578, -82.4584	(10)SBY - UT Tributary to	Riprap Energy Dissipator Basin	Class I	9.5	Pipe	54	26.1	3.4	N/A
12	-L- Sta. 496+00 LT 35.3662, -82.4662	(7)SBG - UT Tributary to	PSH	Class 'B'	1.1	Pipe	15	6.2	0.9	N/A
13	-L- Sta. 499+77 RT 35.3674, -82.4665	WAH	Riprap Energy Dissipator Basin	Class 'B'	0.3	Pipe	15	1.6	1.7	N/A
17	-L- Sta. 558+00 LT 35.3781, -82.4808	(20)SBN - UT to Mud Creek	Riprap Energy Dissipator Basin	Class I	16.2	Pipe	36	29.4	3.5	N/A
18	-L- Sta. 572+75 LT 35.3807, -82.4847	(9)SBI - UT Tributary to	Riprap Energy Dissipator Basin	Class I	39.5	Culvert	66	108.5	4.9	N/A
21	-L- 609+75 LT 35.3900, -82.4910	(1)Byers Creek	PSH	Class 'B'	1.2	Pipe	15	6.0	N/A	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-4400BB

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

HENDERSON COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-4400BB	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34232.1.6	NHP-0026(015)	I-4400BB (P.E.)
34232.2.10	NHP-0026(015)	I-4400BB (RW/UTIL)
34232.3.8	NHP-0026(015)	I-4400BB (CONST.)

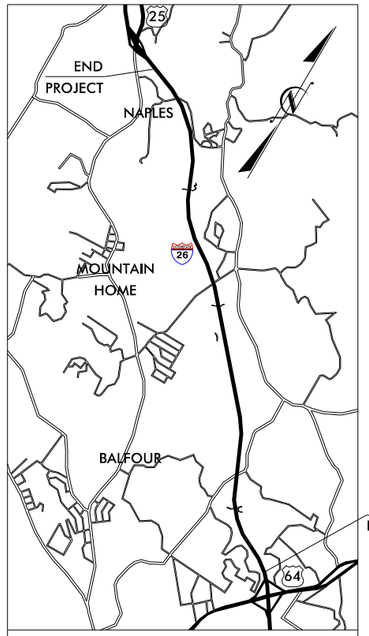
PERMIT DRAWING
SHEET 1 OF 83

LOCATION: I-26 FROM 0.05MI NORTH OF US 64
TO 0.5MI SOUTH OF US 25 (ASHEVILLE HIGHWAY)

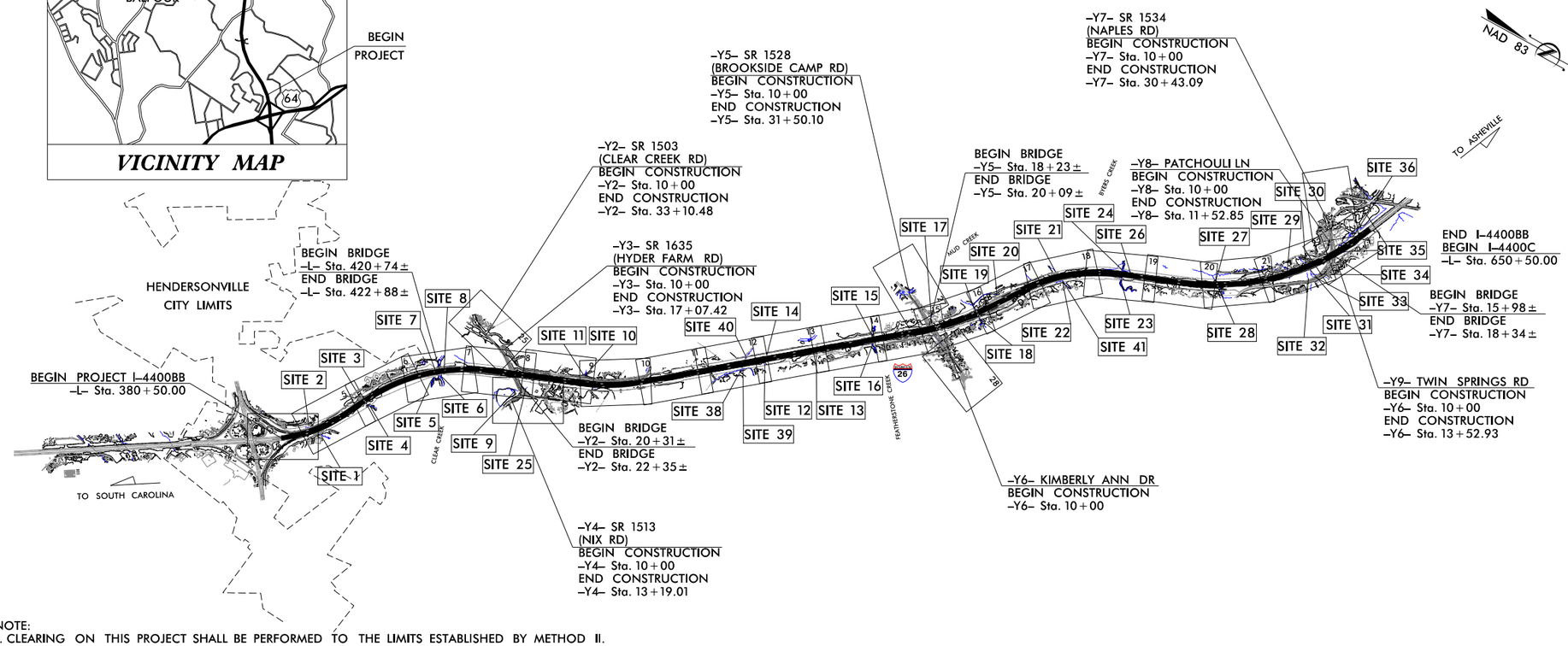
TYPE OF WORK: DRAINAGE, PAVING, GRADING, STRUCTURES

WETLAND AND SURFACE WATER IMPACTS PERMIT

PERMIT DRAWINGS
8/6//2019



VICINITY MAP



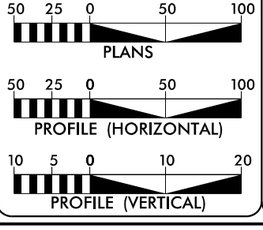
NOTE:
1. CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.
2. THIS PROJECT IS PARTIALLY WITHIN THE MUNICIPAL BOUNDARIES OF THE CITY OF HENDERSONVILLE.
3. THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

CONTRACT:

GRAPHIC SCALES



DESIGN DATA

ADT 2019 = 63,900
ADT 2040 = 91,000
K = 10%
D = 55%
T = 15% *
V = 70 MPH
* TTST = 11% DUAL 4%

FUNC CLASS = INTERSTATE
STATEWIDE TIER

PROJECT LENGTH

TOTAL LENGTH OF ROADWAY TIP PROJECT

I-4400BB = 5.073 MI

TOTAL LENGTH OF STRUCTURES OF TIP PROJECT

I-4400BB = 0.041 MI

TOTAL LENGTH OF TIP PROJECT

I-4400BB = 5.114 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:
November 2018

LETTING DATE:
June 18, 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 •

7/24/2017
I4400C_RDY_TSH.dgn
3:11 PM

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-4400BB	2A-5
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

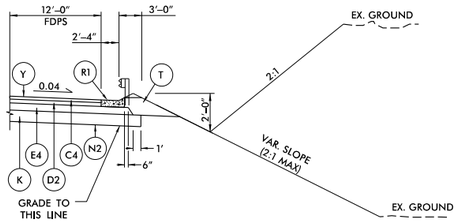
PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047262 ENGINEER MATTHEW J. KIRBY

PERMIT DRAWING SHEET 2 OF 83

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

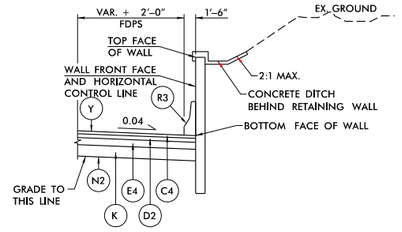
REVISIONS



SHOULDER BERM GUTTER AND GUARDRAIL DETAIL

USE IN CONJUNCTION WITH TYPICAL SECTIONS NO. 1, 2, 3 & 4

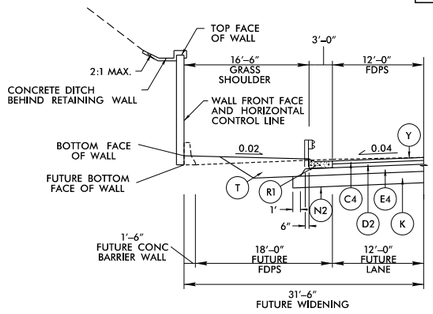
–Y1RPA– STA. 11+53.00 TO STA. –L– 389+34.25 LT (INVERT)
–Y1RPD– STA. 11+80.00 TO –L– STA. 400+97.00 RT
–L– STA. 399+99.00 TO STA. 405+36.50 LT (INVERT)
–L– STA. 403+13.00 TO STA. 408+73.00 RT
–L– STA. 419+53.00 TO STA. 420+26.23 LT (INVERT)
–L– STA. 423+23.12 TO STA. 463+16.00 LT (INVERT)
–L– STA. 436+43.00 TO STA. 440+68.00 RT
–L– STA. 450+90.00 TO STA. 462+40.00 RT
–L– STA. 470+71.25 TO STA. 473+15.00 LT (INVERT)
–L– STA. 475+50.00 TO STA. 480+25.00 RT
–L– STA. 483+90.00 TO STA. 500+00.00 RT
–L– STA. 488+48.00 TO STA. 519+10.50 LT (INVERT)
–L– STA. 506+12.50 TO STA. 513+25.00 RT
–L– STA. 518+61.00 TO STA. 528+73.50 RT
–L– STA. 524+75.00 TO STA. 548+50.00 LT (INVERT)
–L– STA. 535+83.00 TO STA. 541+33.00 RT
–L– STA. 540+68.00 TO 548+52.00 LT (INVERT)
–L– STA. 546+93.00 TO –WEIGH C– STA. 11+15.50 RT
–WEIGH A– STA. 13+31 TO STA. 590+80.50 LT (INVERT)
–L– STA. 566+00.00 TO STA. 588+37.50 RT
–L– STA. 596+25.00 TO STA. 612+50.00 RT
–L– STA. 606+00.00 TO STA. 614+02.00 LT (INVERT)
–L– STA. 616+65.00 TO STA. 617+80.00 RT
–L– STA. 619+00.00 TO STA. 620+87.50 LT (INVERT)
–L– STA. 625+12.50 TO STA. 627+00.00 RT
–L– STA. 627+49.00 TO STA. 636+50.00 LT (INVERT)
–L– STA. 635+37.50 TO STA. 646+50.00 RT
–L– STA. 638+87.50 STA. 650+50.00 LT (INVERT)



CUT WALL DETAIL

USE IN CONJUNCTION WITH TYPICAL SECTION NO.2

–L– STA. 408+73.00 TO STA. 418+48.43 RT
–L– STA. 424+97.92 TO STA. 429+13.00 RT
–L– STA. 533+52.00 TO STA. 538+96.00 LT



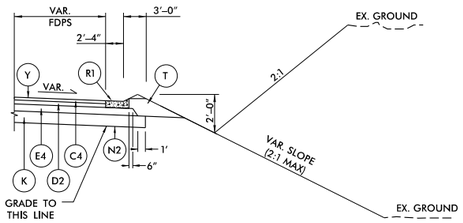
OFFSET CUT WALL WITH SHOULDER BERM GUTTER AND GUARDRAIL DETAIL

USE IN CONJUNCTION WITH TYPICAL SECTION NO.2

–L– STA. 437+77.00 TO STA. 439+51.00 LT
–L– STA. 438+79.00 TO STA. 440+65.00 RT (INVERT)
–L– STA. 533+52.00 TO STA. 540+68.00 LT
–L– STA. 539+30.00 TO STA. 541+29.00 RT (INVERT)
–L– STA. 637+28.00 TO STA. 639+55.00 RT (INVERT)
–L– STA. 638+98.00 TO STA. 640+91.00 LT

A1	13.0" PCCP
C1	1.25" S9.5B
C3	3" S9.5B
C4	3" S9.5C
C5	1.5" S9.5C
D1	2.5" I19.0C
D2	4" I19.0C
E1	4" B25.0C
E2	5" B25.0C
E3	5.5" B25.0C
E4	7.25" B25.0C
K	12" CLASS IV SUBGRADE STABILIZATION
N1	NONWOVEN GEOTEXTILE INTERLAYER
N2	GEOTEXTILE FOR SOIL STABILIZATION
R1	CONC. SHOULDER BERM GUTTER
R2	DOUBLE FACED SINGLE SLOPED CONC. BARRIER
R3	SINGLE FACED CONC. BARRIER
R4	SINGLE FACED BARRIER W/ MOMENT SLAB
R5	EXPRESSWAY GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	MILLING 1.5" DEPTH
Y	MILLED RUMBLE STRIPS

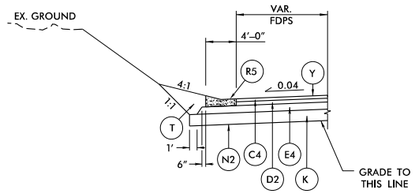
PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE



SHOULDER BERM GUTTER DETAIL

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 2

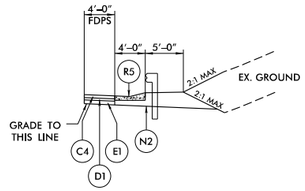
–L– STA. 624+00.00 TO STA. 625+12.50 RT



EXPRESSWAY GUTTER DETAIL

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 2, 5 & 8

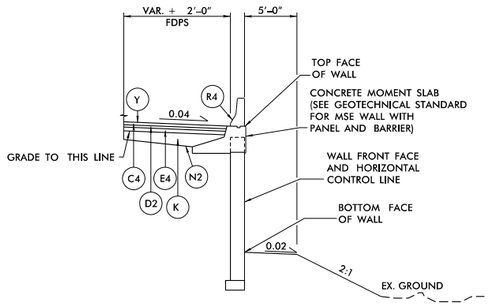
–L– STA. 463+36.00 TO STA. 470+25.00 LT
–L– STA. 618+00.00 TO STA. 623+80.00 RT (INVERT)
–Y2– STA. 12+40.00 TO STA. 14+00.00 LT (EXCLUDE MILLED RUMBLE STRIPS)
–Y5– STA. 26+25.00 TO STA. 31+80.00 RT (INVERT & EXCLUDE MILLED RUMBLE STRIPS)



EXPRESSWAY GUTTER DETAIL

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 2 & NO. 3

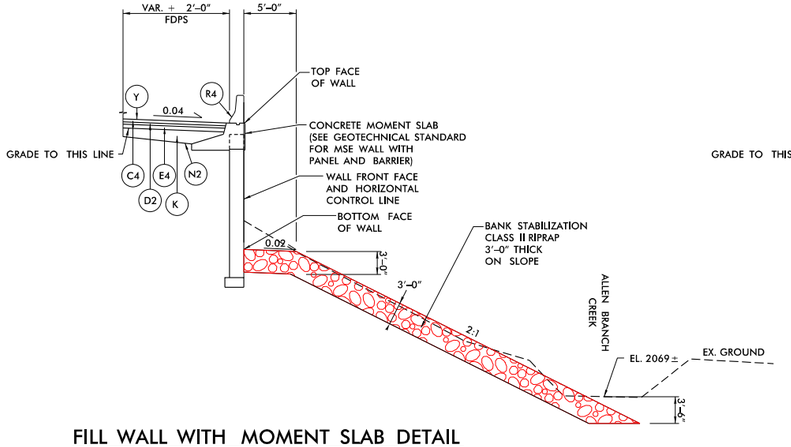
–Y1RPD– STA. 11+80.00 TO STA. 14+39.00 LT



FILL WALL WITH MOMENT SLAB DETAIL

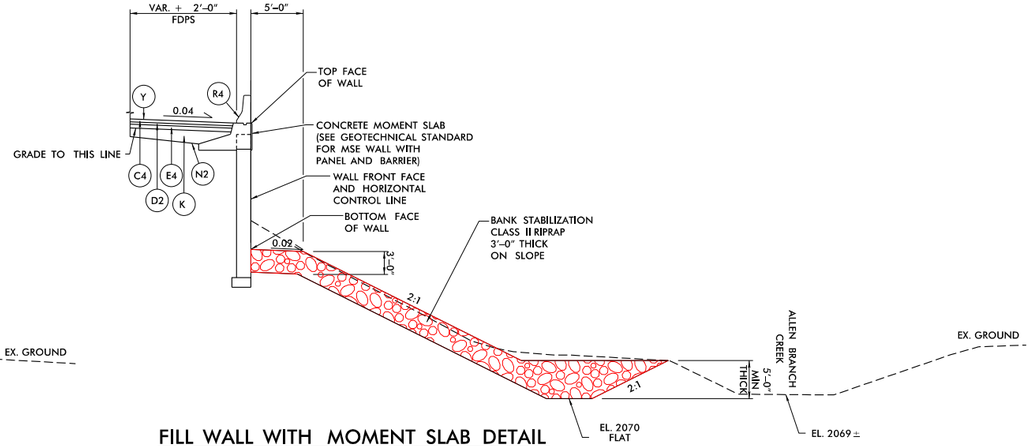
USE IN CONJUNCTION WITH TYPICAL SECTIONS NO. 2 & 11

–L– STA. 400+97.00 TO STA. 403+13.00 RT
–L– STA. 422+99.22 TO STA. 424+14.01 RT
–Y7– STA. 19+97.00 TO STA. 25+75.00 RT (EXCLUDE MILLED RUMBLE STRIPS)



FILL WALL WITH MOMENT SLAB DETAIL

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 2
–L– STA. 419+88.42 TO STA. 420+52.62 RT



FILL WALL WITH MOMENT SLAB DETAIL

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 2
–L– STA. 418+48.43 RT TO STA. 419+88.42 RT
–L– STA. 420+52.62 RT TO STA. 420+57.44 RT

$$PEN_TABLE$$
$$$

DITCH DETAILS

Vaughn & Melton Consulting Engineers, Inc.
10505 Kincross Lane
Charlotte, NC 28217
NC License No: P-1088

Parrish and Partners of North Carolina, PLLC
11329 N Community House Rd
Suite 260
Charlotte, NC 28277
NC License No: P-1212

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	2D-1

RW SHEET NO.

HYDRAULICS ENGINEERS

NORTH CAROLINA PROFESSIONAL SEAL 047435 ENGINEER JON C. FORD

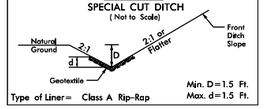
NORTH CAROLINA PROFESSIONAL SEAL 035700 ENGINEER KEVIN P. HIGGINS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 3 OF 83

REVISIONS

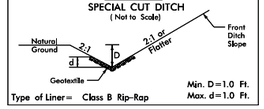
DETAIL A
SPECIAL CUT DITCH (Not to Scale)



Type of Liner= Class A Rip-Rap
Min. D=1.5 Ft.
Max. d=1.5 Ft.

FROM –Y1RPD– STA. 12+00 TO STA. 14+00 LT

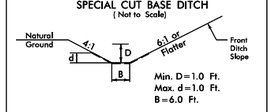
DETAIL B
SPECIAL CUT DITCH (Not to Scale)



Type of Liner= Class B Rip-Rap
Min. D=1.0 Ft.
Max. d=1.0 Ft.

FROM –L– STA. 396+25 TO STA. 399+25 RT

DETAIL C
SPECIAL CUT BASE DITCH (Not to Scale)

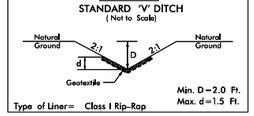


Min. D=1.0 Ft.
Max. d=1.0 Ft.
B=6.0 Ft.

Type of Liner= PSRM

FROM –L– STA. 468+20 TO STA. 471+50 RT

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

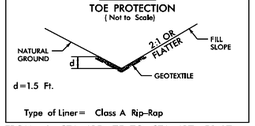


Min. D=2.0 Ft.
Max. d=1.5 Ft.

Type of Liner= Class I Rip-Rap

FROM –L– STA. 552+00 TO STA. 553+20 LT

DETAIL E
TOE PROTECTION (Not to Scale)

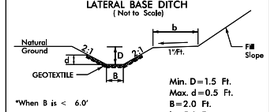


d=1.5 Ft.

Type of Liner= Class A Rip-Rap

FROM –L– STA. 485+75 TO STA. 487+50 LT
FROM –L– STA. 492+70 TO STA. 494+00 LT

DETAIL F
LATERAL BASE DITCH (Not to Scale)



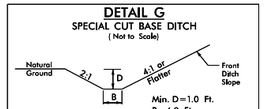
Min. D=1.5 Ft.
Max. d=0.5 Ft.
B=2.0 Ft.
b=5.0 Ft.

*When B is < 6.0'

Type of Liner= Class A Rip-Rap

FROM –L– STA. 510+50 TO STA. 513+20 RT

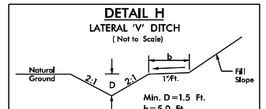
DETAIL G
SPECIAL CUT BASE DITCH (Not to Scale)



Min. D=1.0 Ft.
B=4.0 Ft.

FROM –L– STA. 505+00 TO STA. 510+00 RT

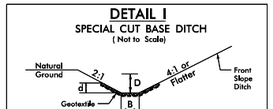
DETAIL H
LATERAL 'V' DITCH (Not to Scale)



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

FROM –Y2– STA. 23+00 TO STA. 26+00 LT

DETAIL I
SPECIAL CUT BASE DITCH (Not to Scale)

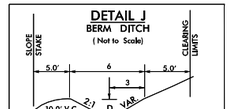


Min. D=1.0 Ft.
Max. d=0.5 Ft.
B=2.0 Ft.

Type of Liner= Class A Rip-Rap

FROM –L– STA. 510+00 TO STA. 510+50 RT

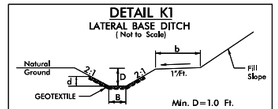
DETAIL J
BERM DITCH (Not to Scale)



Min. D=1.5 Ft.

FROM –L– STA. 515+50 TO STA. 519+50 RT

DETAIL K1
LATERAL BASE DITCH (Not to Scale)



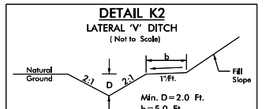
Min. D=1.0 Ft.
Max. d= 1.0 Ft.
B=1.0 Ft.
b=5.0 Ft.

*When B is < 6.0'

Type of Liner= Class B Rip-Rap

FROM –L– STA. 529+75 TO STA. 530+00 LT

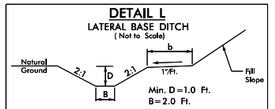
DETAIL K2
LATERAL 'V' DITCH (Not to Scale)



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

FROM –L– STA. 530+00 TO STA. 531+50 LT

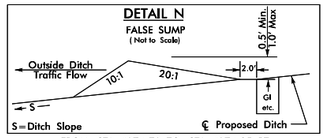
DETAIL L
LATERAL BASE DITCH (Not to Scale)



Min. D=1.0 Ft.
B=2.0 Ft.
b=5.0 Ft.

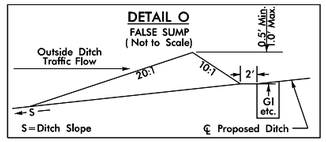
FROM –Y5– STA. 12+25 TO STA. 17+50 RT
FROM –Y5– STA. 20+65 TO STA. 22+35 RT
FROM –Y5– STA. 13+50 TO STA. 16+50 LT
FROM –Y5– STA. 28+00 TO STA. 30+50 LT
FROM –Y5– STA. 20+60 TO STA. 22+75 LT

DETAIL N
FALSE SUMP (Not to Scale)



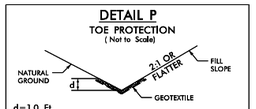
FROM STA. 407+70 TO STA. 407+85 RT
FROM STA. 437+50 TO STA. 437+65 LT
FROM STA. 437+60 TO STA. 437+75 LT
FROM STA. 468+15 TO STA. 468+30 RT
FROM STA. 471+55 TO STA. 471+70 RT
FROM STA. 474+75 TO STA. 474+90 RT
FROM STA. 475+92 TO STA. 476+07 RT
FROM STA. 519+50 TO STA. 519+65 RT
FROM STA. 577+80 TO STA. 577+95 RT
FROM STA. 581+20 TO STA. 581+35 RT
FROM STA. 585+00 TO STA. 585+15 RT

DETAIL O
FALSE SUMP (Not to Scale)



FROM STA. 410+75 TO STA. 410+90 LT
FROM STA. 429+10 TO STA. 429+25 RT
FROM STA. 418+10 TO STA. 418+25 LT
FROM STA. 434+40 TO STA. 434+55 RT
FROM STA. 438+35 TO STA. 438+50 RT
FROM STA. 475+98 TO STA. 476+13 LT
FROM STA. 483+90 TO STA. 484+05 LT
FROM STA. 538+35 TO STA. 538+50 RT
FROM STA. 546+80 TO STA. 546+95 RT
FROM STA. 581+20 TO STA. 581+35 LT
FROM STA. 582+75 TO STA. 582+90 LT

DETAIL P
TOE PROTECTION (Not to Scale)

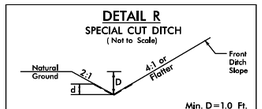


d=1.0 Ft.

Type of Liner= Class B Rip-Rap

FROM –L– STA. 542+75 TO STA. 544+00 RT
FROM –L– STA. 545+25 TO STA. 546+50 RT
FROM –L– STA. 567+00 TO STA. 567+75 RT
FROM –L– STA. 573+90 TO STA. 575+00 RT
FROM –L– STA. 583+00 TO STA. 583+50 LT
FROM –Y5– STA. 17+50 TO STA. 17+75 RT
FROM –Y5– STA. 16+50 TO STA. 18+15 LT
FROM –Y5– STA. 20+60 TO STA. 22+75 LT

DETAIL R
SPECIAL CUT DITCH (Not to Scale)

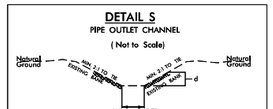


Min. D=1.0 Ft.
Max d=0.5 Ft.

Type of Liner= NAG S75 OR EQUIV.

FROM –Y2– STA. 10+00 TO STA. 10+75 RT
FROM –Y2– STA. 29+00 TO STA. 30+00 RT

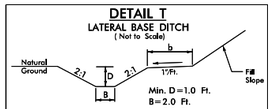
DETAIL S
PIPE OUTLET CHANNEL (Not to Scale)



Length=15 Ft.
d=1.25 Ft.
Est.= 15 Tons of Class I Rip-Rap

FROM –L– STA. 551+70 TO STA. 551+80 LT
FROM –L– STA. 389+50 TO STA. 389+60 RT
FROM –Y2– STA. 24+80 TO STA. 24+90 LT
FROM –L– STA. 456+60 TO STA. 456+70 LT
FROM –L– STA. 557+90 TO STA. 558+00 LT
FROM –L– STA. 572+70 TO STA. 572+80 LT

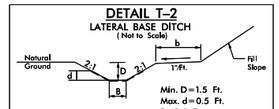
DETAIL T
LATERAL BASE DITCH (Not to Scale)



Min. D=1.0 Ft.
B=2.0 Ft.
b=5.0 Ft.

FROM –Y2– STA. 22+00 TO STA. 24+80 RT
FROM –Y2– STA. 17+25 TO STA. 20+00 LT
FROM –Y3– STA. 11+00 TO STA. 14+00 IT

DETAIL T–2
LATERAL BASE DITCH (Not to Scale)

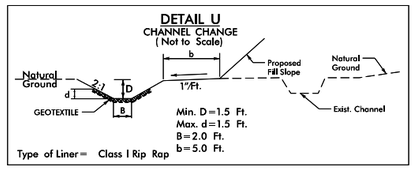


Min. D=1.5 Ft.
Max. d=0.5 Ft.
B=2.0 Ft.
b=5.0 Ft.

Type of Liner= PSRM

FROM –Y2– STA. 22+00 TO STA. 24+85 RT

DETAIL U
CHANNEL CHANGE (Not to Scale)

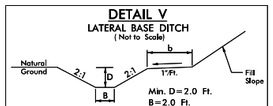


Min. D=1.5 Ft.
Max. d=1.5 Ft.
B=2.0 Ft.
b=5.0 Ft.

Type of Liner= Class I Rip Rap

FROM –L– STA. 572+25 TO STA. 573+80 RT
FROM –L– STA. 583+75 TO STA. 585+00 LT

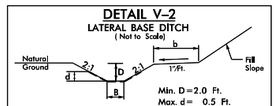
DETAIL V
LATERAL BASE DITCH (Not to Scale)



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

FROM –L– STA. 433+50 TO STA. 435+50 LT
FROM –Y2– STA. 27+30 TO STA. 29+00 RT

DETAIL V–2
LATERAL BASE DITCH (Not to Scale)

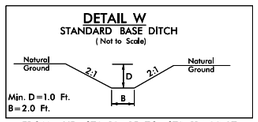


Min. D=2.0 Ft.
Max. d= 0.5 Ft.
B=2.0 Ft.
b=5.0 Ft.

Type of Liner= NAG SC150 OR EQUIVALENT

FROM –Y2– STA. 27+30 TO STA. 29+00 RT

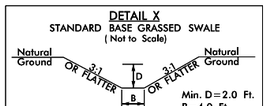
DETAIL W
STANDARD BASE DITCH (Not to Scale)



Min. D=1.0 Ft.
B=2.0 Ft.

FROM –Y5– STA. 10+15 TO STA. 11+00 LT

DETAIL X
STANDARD BASE GRASSED SWALE (Not to Scale)

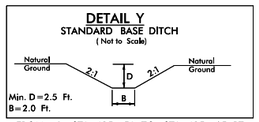


Min. D=2.0 Ft.
B=4.0 Ft.

*NOTES:
1) LONGITUDINAL SLOPES BETWEEN 0.3% AND 4.0%.
2) MODIFICATIONS MAY BE NEEDED, AS APPROVED BY ENGINEER.

FROM –L– STA. 501+50 TO STA. 518+50 LT
FROM –L– STA. 513+00 TO STA. 518+50 LT

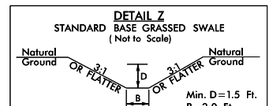
DETAIL Y
STANDARD BASE DITCH (Not to Scale)



Min. D=2.5 Ft.
B=2.0 Ft.

FROM –L– STA. 485+50 TO STA. 485+65 RT

DETAIL Z
STANDARD BASE GRASSED SWALE (Not to Scale)

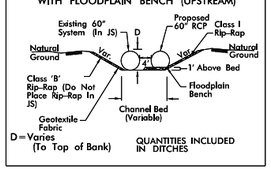


Min. D=1.5 Ft.
B=2.0 Ft.

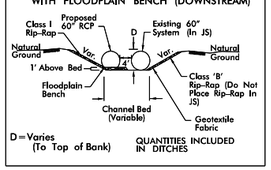
*NOTES:
1) LONGITUDINAL SLOPES BETWEEN 0.3% AND 4.0%.
2) MODIFICATIONS MAY BE NEEDED, AS APPROVED BY ENGINEER.

FROM –L– STA. 524+20 TO STA. 525+60 RT
FROM –L– STA. 524+75 TO STA. 526+05 LT

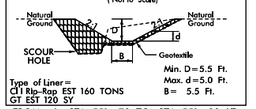
DETAIL AB (Not to Scale)
CULVERT CHANNEL IMPROVEMENTS WITH FLOODPLAIN BENCH (UPSTREAM)



DETAIL AA (Not to Scale)
CULVERT CHANNEL IMPROVEMENTS WITH FLOODPLAIN BENCH (DOWNSTREAM)



DETAIL AC
CULVERT OUTLET CHANNEL CHANGE (Not to Scale)

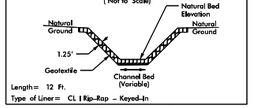


Min. D=5.5 Ft.
Max. d=5.0 Ft.
B= 5.5 Ft.

Type of Liner= CLI Rip-Rap EST 160 TONS GT EST 120 SY

FROM –L– STA. 551+70 TO STA. 551+80 LT
–L– STA. 572+75 LT

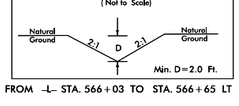
DETAIL AD
PIPE OUTLET CHANNEL STABILIZATION (Not to Scale)



Length= 12 Ft.
Type of Liner= CL I Rip-Rap – Keyed-In

–L– STA. 558+02 LT

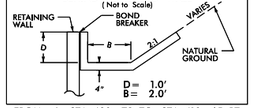
DETAIL AE
STANDARD 'V' DITCH (Not to Scale)



Min. D=2.0 Ft.

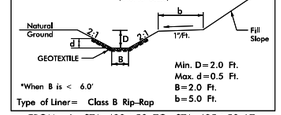
FROM –L– STA. 566+03 TO STA. 566+65 LT

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



FROM –L– STA. 408+73 TO STA. 418+65 RT
FROM –L– STA. 424+14 TO STA. 429+13 RT
FROM –L– STA. 438+79 TO STA. 440+65 RT
FROM –L– STA. 437+77 TO STA. 439+51 LT
FROM –L– STA. 533+52 TO STA. 540+68 LT
FROM –L– STA. 539+30 TO STA. 541+29 RT
FROM –L– STA. 637+28 TO STA. 639+55 RT
FROM –L– STA. 638+98 TO STA. 640+91 LT

DETAIL AG
LATERAL BASE DITCH (Not to Scale)



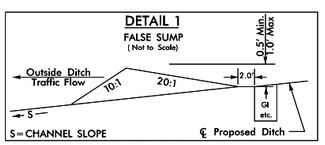
Min. D=2.0 Ft.
Max. d=0.5 Ft.
B=2.0 Ft.
b=5.0 Ft.

*When B is < 6.0'

Type of Liner= Class B Rip-Rap

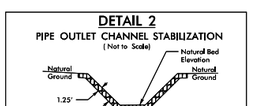
FROM –L– STA. 433+50 TO STA. 435+50 LT

DETAIL 1
FALSE SUMP (Not to Scale)



FROM STA. 595+97 TO STA. 596+29 LT
FROM STA 595+97 TO STA. 596+29 RT
FROM STA. 602+46 TO STA. 602+63 LT

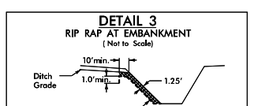
DETAIL 2
PIPE OUTLET CHANNEL STABILIZATION (Not to Scale)



Length= 15 Ft.
Type of Liner= CL II Rip-Rap – Keyed-In

STA. 590+17 TO STA. 590+02

DETAIL 3
RIP RAP AT EMBANKMENT (Not to Scale)



Type of Liner= GT; 7 TONS, CL II Rip-Rap Geotextile= 10 SY

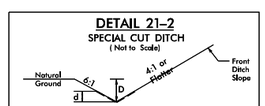
FROM STA. 590+15 TO STA. 590+35 –L– LT

DETAIL 21–1
SPECIAL CUT DITCH (Not to Scale)

Min. D= 1.0 Ft.

FROM STA. 614+50 TO STA. 615+30 –L– LT

DETAIL 21–2
SPECIAL CUT DITCH (Not to Scale)

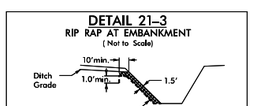


Min. D= 1.5 Ft.
Max d= 1.5 Ft.

Type of Liner= Class "B" Rip-Rap

FROM STA. 615+30 to 616+00 –L– LT

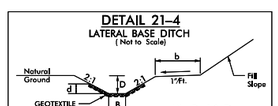
DETAIL 21–3
RIP RAP AT EMBANKMENT (Not to Scale)



Type of Liner– 16 TONS,CL 1 Rip-Rap Geotextile– 21 SY

FROM STA. 611+64 TO STA. 611+85 –L– RT

DETAIL 21–4
LATERAL BASE DITCH (Not to Scale)



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

*When B is < 6.0'

Type of Liner= CLASS "B" Rip-Rap

FROM STA. 611+75 TO STA. 613+50 –L– RT

DESIGNED: SSS
DRAWN: SSS
CHECKED: SSS
SUBMITTED: SSS
DATE: SSS
SEAL: SSS
USERNAME: SSS
TIME: SSS

DITCH DETAILS

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PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	2D-2

RW SHEET NO.

HYDRAULICS ENGINEERS

NORTH CAROLINA PROFESSIONAL SEAL 047435 ENGINEER JON C. FORD

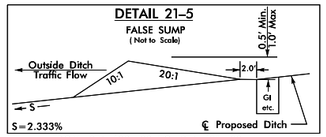
NORTH CAROLINA PROFESSIONAL SEAL 035700 ENGINEER KEVIN P. HIGGINS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 4 OF 83

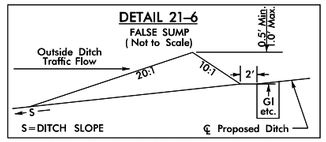
REVISIONS

DETAIL 21–5
FALSE SUMP (Not to Scale)



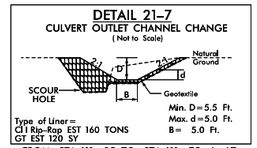
FROM STA. 620+80 TO STA. 621+00 –L– LT

DETAIL 21–6
FALSE SUMP (Not to Scale)



FROM STA. 616+43 TO STA. 616+63 –L– RT

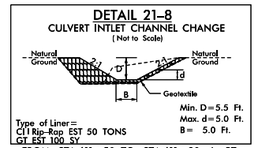
DETAIL 21–7
CULVERT OUTLET CHANNEL CHANGE (Not to Scale)



Type of Liner= CI I Rip-Rap EST 160 TONS, GT EST 120 SY
Min. D=5.5 Ft. Max. d=5.0 Ft. B= 5.0 Ft.

FROM STA.611+35 TO STA.611+75 –L– LT

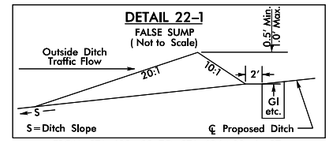
DETAIL 21–8
CULVERT INTLET CHANNEL CHANGE (Not to Scale)



Type of Liner= CI I Rip-Rap EST 50 TONS, GT EST 100 SY
Min. D=5.5 Ft. Max. d=5.0 Ft. B= 5.0 Ft.

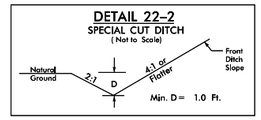
FROM STA.611+50 TO STA.611+80 –L– RT

DETAIL 22–1
FALSE SUMP (Not to Scale)



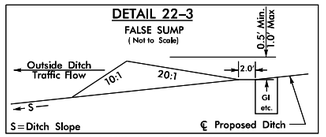
FROM STA. 623+80 TO STA. 624+00 –L– RT
FROM STA. 635+30 TO STA. 635+60 –L– LT
FROM STA. 636+50 TO STA. 636+80 –L– LT

DETAIL 22–2
SPECIAL CUT DITCH (Not to Scale)



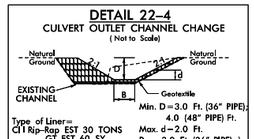
FROM STA. 624+00 TO STA. 623+25

DETAIL 22–3
FALSE SUMP (Not to Scale)



FROM STA. 629+25 TO STA. 629+50 –L– RT
FROM STA. 635+27 TO STA. 635+55 –L– RT
FROM STA. 22+05 TO STA. 22+30–Y7– LT

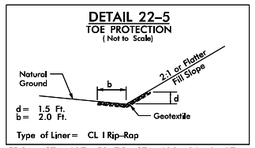
DETAIL 22–4
CULVERT OUTLET CHANNEL CHANGE (Not to Scale)



Type of Liner= CI I Rip-Rap EST 30 TONS, GT EST 60 SY
Min. D=3.0 Ft. (36" PIPE); 4.0 (48" PIPE) Ft. Max. d=2.0 Ft. B= 3.0 Ft. (36" PIPE); \ 4.0 (48" PIPE) Ft.

STA. 628+21 –L– LT 36" OUTLET
STA. 633+00 –L– LT 48" OUTLET

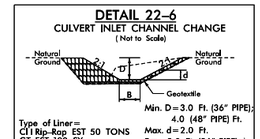
DETAIL 22–5
TOE PROTECTION (Not to Scale)



d= 1.5 Ft.
b= 2.0 Ft.
Type of Liner= CL I Rip-Rap

FROM STA. 627+52 TO STA. 628+20 –L– LT

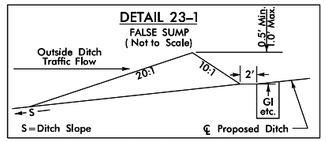
DETAIL 22–6
CULVERT INLET CHANNEL CHANGE (Not to Scale)



Type of Liner= CI I Rip-Rap EST 50 TONS, GT EST 100 SY
Min. D=3.0 Ft. (36" PIPE); 4.0 (48" PIPE) Ft. Max. d=2.0 Ft. B= 3.0 Ft. (36" PIPE); \ 4.0 (48" PIPE) Ft.

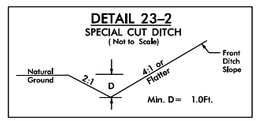
STA. 628+21 –L– RT 36" INLET
STA. 633+30 –L– RT 48" INLET

DETAIL 23–1
FALSE SUMP (Not to Scale)



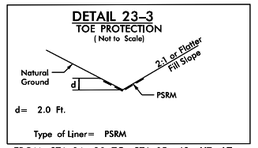
FROM STA. 637+52 TO STA. 637+85 –L– LT

DETAIL 23–2
SPECIAL CUT DITCH (Not to Scale)



FROM STA. 641+00 TO STA. 642+22 –L– RT
FROM STA. 10+50 TO STA. 11+00 –Y9– LT

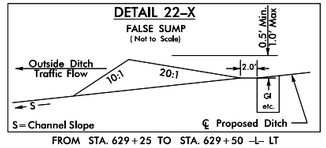
DETAIL 23–3
TOE PROTECTION (Not to Scale)



d= 2.0 Ft.
Type of Liner= PSRM

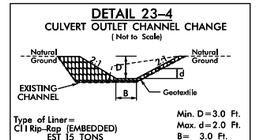
FROM STA. 14+20 TO STA. 15+40 –Y7– LT

DETAIL 22–X
FALSE SUMP (Not to Scale)



FROM STA. 629+25 TO STA. 629+50 –L– LT

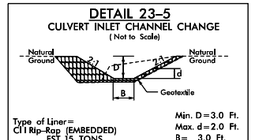
DETAIL 23–4
CULVERT OUTLET CHANNEL CHANGE (Not to Scale)



Type of Liner= CI I Rip-Rap (EMBEDDED) EST 15 TONS, GT EST 30 SY
Min. D=3.0 Ft. Max. d=2.0 Ft. B= 3.0 Ft.

STA. 642+20 –L– RT 42" OUTLET
STA. 646+10 –L– LT 36" OUTLET

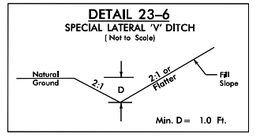
DETAIL 23–5
CULVERT INLET CHANNEL CHANGE (Not to Scale)



Type of Liner= CI I Rip-Rap (EMBEDDED) EST 15 TONS, GT EST 30 SY
Min. D=3.0 Ft. Max. d=2.0 Ft. B= 3.0 Ft.

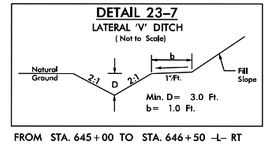
STA. 642+20 –L– RT 42" INLET
STA. 646+10 –L– RT 36" INLET

DETAIL 23–6
SPECIAL LATERAL 'V' DITCH (Not to Scale)



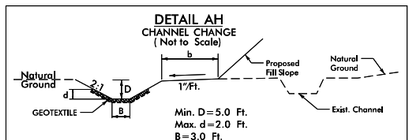
FROM STA. 643+50 TO STA. 645+00 –L– RT
FROM STA. 642+28 TO STA. 643+50 –L– RT

DETAIL 23–7
LATERAL 'V' DITCH (Not to Scale)



FROM STA. 645+00 TO STA. 646+50 –L– RT

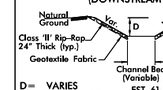
DETAIL AH
CHANNEL CHANGE (Not to Scale)



Type of Liner= Class II Rip Rap

–L– STA. 573+81 RT

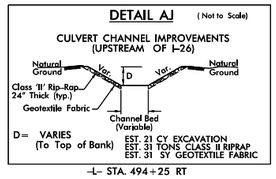
DETAIL AI (Not to Scale)
CULVERT CHANNEL IMPROVEMENTS (DOWNSTREAM OF I-26)



D= VARIES (To Top of Bank)
EST. 61 CY EXCAVATION
EST. 90 TONS CLASS II RIPRAP
EST. 91 SY GEOTEXTILE FABRIC

–L– STA. 495+55 LT

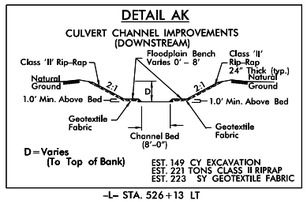
DETAIL AJ (Not to Scale)
CULVERT CHANNEL IMPROVEMENTS (UPSTREAM OF I-26)



D= VARIES (To Top of Bank)
EST. 21 CY EXCAVATION
EST. 31 TONS CLASS II RIPRAP
EST. 31 SY GEOTEXTILE FABRIC

–L– STA. 494+25 RT

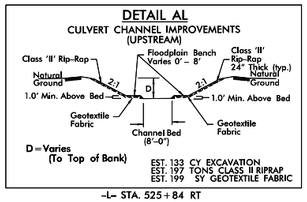
DETAIL AK
CULVERT CHANNEL IMPROVEMENTS (DOWNSTREAM)



D=Varies (To Top of Bank)
EST. 149 CY EXCAVATION
EST. 221 TONS CLASS II RIPRAP
EST. 223 SY GEOTEXTILE FABRIC

–L– STA. 526+13 LT

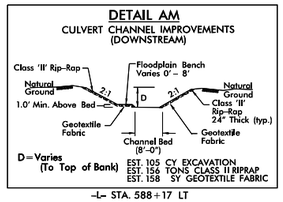
DETAIL AL
CULVERT CHANNEL IMPROVEMENTS (UPSTREAM)



D=Varies (To Top of Bank)
EST. 133 CY EXCAVATION
EST. 197 TONS CLASS II RIPRAP
EST. 199 SY GEOTEXTILE FABRIC

–L– STA. 525+84 RT

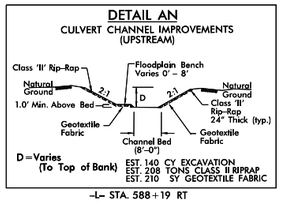
DETAIL AM
CULVERT CHANNEL IMPROVEMENTS (DOWNSTREAM)



D=Varies (To Top of Bank)
EST. 105 CY EXCAVATION
EST. 156 TONS CLASS II RIPRAP
EST. 158 SY GEOTEXTILE FABRIC

–L– STA. 588+17 LT

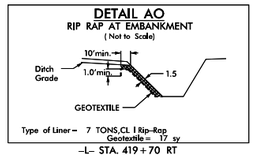
DETAIL AN
CULVERT CHANNEL IMPROVEMENTS (UPSTREAM)



D=Varies (To Top of Bank)
EST. 140 CY EXCAVATION
EST. 208 TONS CLASS II RIPRAP
EST. 210 SY GEOTEXTILE FABRIC

–L– STA. 588+19 RT

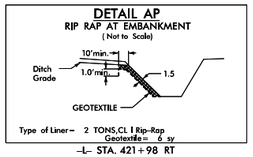
DETAIL AO
RIP RAP AT EMBANKMENT (Not to Scale)



Type of Liner– 7 TONS,CL I Rip-Rap
Geotextile= 17 sy

–L– STA. 419+70 RT

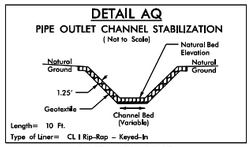
DETAIL AP
RIP RAP AT EMBANKMENT (Not to Scale)



Type of Liner– 2 TONS,CL I Rip-Rap
Geotextile= 6 sy

–L– STA. 421+98 RT

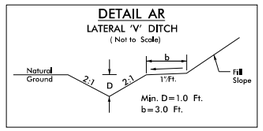
DETAIL AQ
PIPE OUTLET CHANNEL STABILIZATION (Not to Scale)



Length= 10 Ft.
Type of Liner= CL I Rip-Rap – Keyed-In

–L– STA. 456+25 LT

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



FROM –L– STA. 506+50 TO STA. 510+75 RT

$$$

PIPE DETAIL

NOT TO SCALE

GENERAL NOTES

USE 4000 PSI MINIMUM COMPRESSIVE STRENGTH CONCRETE.

DESIGN, FABRICATE AND ASSEMBLE PRECAST MANHOLE COMPONENTS IN ACCORDANCE WITH AASHTO M199.

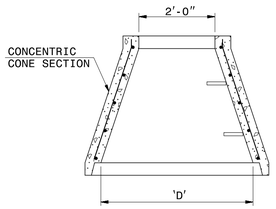
ASSEMBLE RISER AND GRADE RINGS WITH STEPS SPACED 16″ FROM THE TOP TO THE BOTTOM OF THE MANHOLE.

WHERE THE MANHOLE IS EXPOSED TO ROAD TRAFFIC, THE TOP OF THE MANHOLE IS TO BE FLUSH WITH THE GROUND. AT OTHER LOCATIONS IT SHOULD BE A MINIMUM OF 9″ ABOVE THE GROUND.

DEPTH OF FILL LIMITED TO 30′-0″ FROM FINSH GRADE TO TOP OF BOTTOM SLAB.

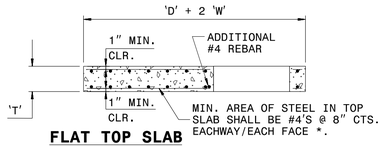
THE MIN. SLAB THICKNESS 'T' SHALL BE THE DIMENSION OF THE THINNEST PORTION OF THE TOP/BOTTOM SLAB.

* TOP MAT OF REINFORCEMENT MAY BE NEGLECTED IF TOP SLAB HAS A DISTINGUISHABLE TOP AND BOTTOM.



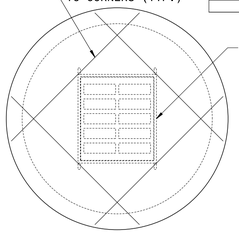
ALTERNATE CONE SECTION

D	W	T	As
INTERNAL DIAMETER (FT.)	MIN. WALL THICKNESS (IN.)	MIN. TOP/BOTTOM SLAB THICKNESS (IN.)	MIN. CIRCUMFERENTIAL AREA OF STEEL PER VERTICAL FT. (SQ. IN.)
7	8.0	8	0.21
8	8.5	8	0.24
9	9.0	9	0.27

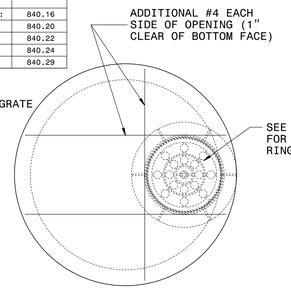


FLAT TOP SLAB

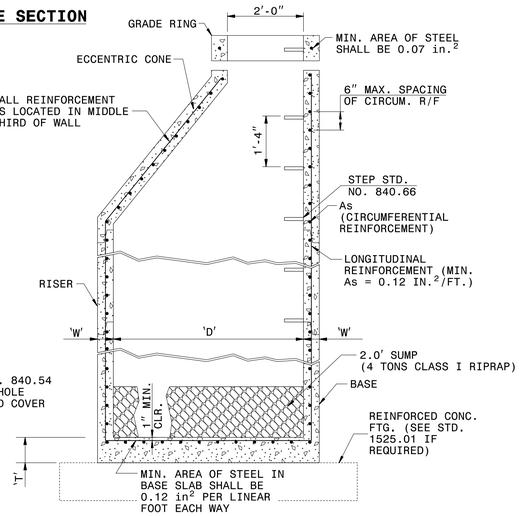
FRAME AND GRATES	STD. NO.
TRAFFIC BEARING	840.37
NONTRAFFIC BEARING:	840.16
	840.20
	840.22
	840.24
	840.29



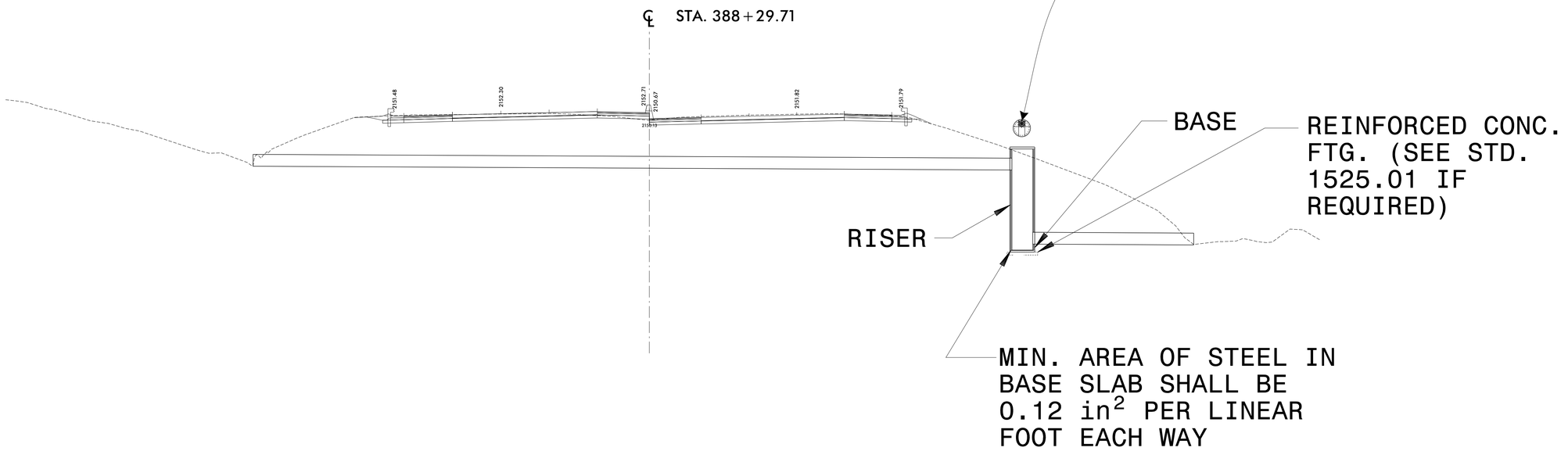
GRATED INLET OPTION



MANHOLE OPTION



TYPICAL MANHOLE SECTION



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-4400BB	2D-3
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 5 OF 83

REVISIONS

$$$$$$SYSTIME$$$$
$$$$$$$$$$$$$$$$$$ODN$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$
$$SCALE$$
$$ENVIRONMENT$$

WETLAND & STREAM IMPACTS

SS SS	DENOTES IMPACTS IN SURFACE WATER
TS TS	DENOTES TEMPORARY IMPACTS IN SURFACE WATER

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Raleigh, North Carolina 27609
NC License No: C-1554

PERMIT DRAWING
SHEET 6 OF 83

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

MATCHLINE SHEET 4 -L- STA 387+00.00

MATCHLINE SHEET 6 -L- STA 401+00.00

NAD 83

CAROLINA VILLAGE, INC.
DB 1341 PG 582
DB 1077 PG 350

TEMP. IMPACTS IN SURFACE WATER

SAZ-I
SITE 2

PLUG & FILL w/ FLOWABLE FILL
REMOVE
CLASS 'B' RIPRAP EST. 1 TONS EST. 5 SYGF
48" WW & ISBW
24" RCP-IV
2GI-B FG
2GI-B SG
15" RCP-IV
TB2GI
TB2GI-A
18" RCP-IV
24" RCP-IV
15" CSP W/ELBOWS AND ROD AND LUG CONNECTORS
CLASS 'B' RIPRAP EST. 101 TONS EST. 1,125 SYGF (FILL EXISTING SCOUR HOLE)
18" RCP-IV
2GI-A SG
SHOULDER DRAIN
6" BST CURB
60" CONC
18" CS&G
36" MED
I-26 EB 39" CONC
I-26 WB 37.5" CONC
DROP STRUCTURE SEE SHEET 2D-3 FOR DETAIL
PIPE NOT BURIED
PLUG & FILL w/ FLOWABLE FILL 48" RCP-IV
CLASS I RIPRAP BANKS ONLY SEE DETAIL S
SITE 1
SAZ-P
ROW FOR FIRST CLAIM (0.0252 AC)
IMPACTS IN SURFACE WATER (48" RCP)
IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL S
TEMP. IMPACTS IN SURFACE WATER
CLASS I RIPRAP EST. 70 TONS EST. 128 SYGF
CLASS 'B' RIPRAP EST. 2 TONS EST. 7 SYGF
SPECIAL CUT DITCH SEE DETAIL B EST. 133 TONS EST. 562 SYGF
24" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS
15" CSP W/ELBOWS AND ROD AND LUG CONNECTORS
CLASS 'B' RIPRAP EST. 1 TONS EST. 5 SYGF
PLUG & FILL w/ FLOWABLE FILL
GROUP VENTURES, INC.
DB 857 PG 631
DB 1051 PG 453
SR 1518 LAKEWOOD
ISMTLBUS
8" PVC
ISFD
W/CATV
SILO

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

FOR -L- PROFILE, SEE SHEET 49 & 50

$$$$$$$SYSTIME$$$$$
$$$$$$$

WETLAND & STREAM IMPACTS

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-4400BB	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 7 OF 83

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

NAD 83

CAROLINA VILLAGE, INC.
DB 1341 PG 582
DB 1077 PG 350

TEMP. IMPACTS IN SURFACE WATER

SAZ-1

SITE 2

PLUG & FILL w/ FLOWABLE FILL

REMOVE

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

PLUG & FILL w/ FLOWABLE FILL

2GI-B SG

2GI-B FG

15" RCP-IV

24" RCP-IV

18" RCP-IV

TB2GI

TB2GI-A

24" WELDED STEEL

TRENCHLESS INSTALLATION

DROP STRUCTURE SEE SHEET ZD-03 FOR DETAIL

PIPE NOT BURIED

PLUG & FILL w/ FLOWABLE FILL 48" RCP-IV CLASS I RIPRAP BANKS ONLY SEE DETAIL S

CLASS I RIPRAP EST. 70 TONS EST. 128 SYGF

30" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

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

IMPACTS IN SURFACE WATER (48" RCP)

SITE 1

SAZ-P

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL S

SPECIAL CUT DITCH SEE DETAIL B EST. 133 TONS EST. 562 SYGF

CLASS 'B' RIPRAP EST. 101 TONS EST. 1.25 SYGF (FILL EXISTING SCOUR HOLE)

15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

CLASS 'B' RIPRAP EST. 5 TONS EST. 34 SYGF

24" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

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

MATCHLINE SHEET 4 –L– STA 387+00.00

MATCHLINE SHEET 6 –L– STA 401+00.00

GROUP VENTURES, INC.
DB 857 PG 63
DB 1051 PG 453

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

FOR –L– PROFILE, SEE SHEET 49 & 50

$$$$$$$SYSTIME$$$$$
$$$$$$$

SITE 2 SAZ–I

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-4400BB	5C
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 8 OF 83

NAD 83

EST. 7 TONS RIPRAP
EST. 7 SYGF
15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS
PLUG & FILL w/ FLOWABLE FILL
PLUG & FILL w/ FLOWABLE FILL
TEMP. IMPACTS IN SURFACE WATER
REMOVE
0416
0415
2GI–B SG
SEE DETAIL O
JS
FS
HW
REMOVE
0509
0508
CLASS 'B' RIPRAP
EST. 1 TONS
EST. 5 SYGF
48" WW & ISBW
DENOTES IMPACTS IN SURFACE WATER
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
15" RCP–IV
2GI–B FG
0507
2GI–B SG
TRENCHLESS INSTALLATION
48" WELDED STEEL
REMOVE
15" RCP–IV
TB2GI
18" RCP–IV
0506
15" RCP–IV
18" RCP–IV
TB2GI
TB2GI–A
0505
0504
15" RCP–IV
TB2GI
TB2GI–A
24" RCP–IV
REMOVE
24" RCP–IV
0412
0413
15" RCP–IV
REMOVE
TB2GI
18" RCP–IV
TB2GI
15" RCP–IV
TB2GI
15" RCP–IV
TB2GI
15" RCP–IV
TB2GI
15" RCP–IV
TB2GI
15" RCP–IV
TB2GI
15" RCP–IV
TB2GI
15" RCP–IV
2GI–B SG
0417
0414
0532
0531
0536
0503
0502
0535
0511
30" RCP–IV
0534
JB w/MH
PLUG & FILL w/ FLOWABLE FILL
PIPE NOT BURIED
IMPACTS IN SURFACE WATER (BANK STABILIZATION)
SEE DETAIL S
IMPACTS IN SURFACE WATER (48" RCP)
0537
DROP STRUCTURE SEE SHEET 2D–3 FOR DETAIL
TEMP. IMPACTS IN SURFACE WATER
+00.00 –L– 160' RT 133.73' RT
+35.00 –L– 160.00' RT 133.65' RT
PLUG & FILL w/ FLOWABLE FILL 48" RCP–IV
CLASS I RIPRAP BANKS ONLY SEE DETAIL S
+75.00 –L– 160.00' RT 133.55' RT
ROW FOR FIRST CLAIM (0.0252 AC)
GRAPHIC SCALE 20' 0' 20' 40' 60'
FOR –L– PROFILE, SEE SHEET 49 & 50
SITE 1 SAZ–P
18" CMP
I-26 EB 45.5° CONC
I-26 WB 44° CONC
42" CMP
24" CMP
48" CMP
8" WD WALL
CONC
ISFBUS
R/W MON.
W/CATV
N 70°28'08" E 54.98'
REVISIONS
$$$$$$CYCTIME$$$$$
$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$
$$$USERNAME$$$$
$$SCALE$$
$$ENVIRONMENT$$

SITE 2 SAZ–I

SITE 1 SAZ–P

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-4400BB	5D
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 9 OF 83

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

$$$$$$SYSTIME$$$$$$
$$$$$$

WETLAND & STREAM IMPACTS

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

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NC License No: C-1554

PERMIT DRAWING
SHEET 10 OF 83

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	6

R/W SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

NAD 83

CAROLINA VILLAGE, INC.
DB 1341 PG 582
DB 1077 PG 350

CAROLINA VILLAGE RETIREMENT

3SF ROCK

SR 1634 CAROLINA VILLAGE RD

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AB

SITE 3

SBA-1

CULVERT CHANNEL IMPROVEMENTS WITH FLOODPLAIN BENCH SEE DETAIL AB CLASS I RIP RAP EST. 73 TONS EST. 16 SYGF

REMOVE EXIST. HW

60' WELDED STEEL PIPE TEMPORARY CHANNEL INSTALLATION

RETAIN, REMOVE WITH CARE AND REINSTALL PROPOSED TUNNEL

15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

2GI-B SG

2GI-B FG

15" RCP-IV

TB2GI

REMOVE

PLUG & FILL w/ FLOWABLE FILL

FS SEE DETAIL N

FS SEE DETAIL O

4OTCB

GRADE TO DRAIN

MATCHLINE SHEET 5 -L- STA 401+00.00

MATCHLINE SHEET 7 -L- STA 415+00.00

SBA-P

SITE 4

CLASS 'B' RIPRAP EST. 66 TONS EST. 277 SYGF

CULVERT CHANNEL IMPROVEMENTS WITH FLOODPLAIN BENCH SEE DETAIL AA CLASS I RIP RAP EST. 73 TONS EST. 40 SYGF

+75.00 -L- 195.64' RT 210.00' RT

10.06 195.00' RT 210.00' RT

BANK STABILIZATION CLASS I RIP RAP EST. 0 TONS EST. 25 SYGF

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AA

GROUP VENTURES, INC.
DB 857 PG 631
DB 1051 PG 453

8" PVC

15"

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

FOR -L- PROFILE, SEE SHEET 50 & 51

$$$$$$$SYSTIME$$$$$
$$$$$$$

WETLAND & STREAM IMPACTS

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

PERMIT DRAWING
SHEET 11 OF 83

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

NAD 83

CAROLINA VILLAGE, INC.
DB 1341 PG 582
DB 1077 PG 350

CAROLINA VILLAGE RETIREMENT

3SF ROCK

SR 1634 CAROLINA VILLAGE RD

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AB

SITE 3

SBA-1

CULVERT CHANNEL IMPROVEMENTS WITH FLOODPLAIN BENCH SEE DETAIL AB CLASS I RIP RAP EST. 73 TONS EST. 16 SYGF

REMOVE EXIST. HW

MATCHLINE SHEET 5 -L- STA 401+00.00

MATCHLINE SHEET 7 -L- STA 415+00.00

15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

4OTCB

GRADE TO DRAIN

2GI-B SG

2GI-B FG

FS SEE DETAIL O

15" RCP-IV

TB2GI

TB2GI-A

REMOVE

PLUG & FILL w/ FLOWABLE FILL

FS SEE DETAIL N

SBA-1

CLASS 'B' RIPRAP EST. 66 TONS EST. 277 SYGF

CULVERT CHANNEL IMPROVEMENTS WITH FLOODPLAIN BENCH SEE DETAIL AA CLASS I RIP RAP EST. 73 TONS EST. 40 SYGF

PDE

8" PVC

TEMP. IMPACTS IN SURFACE WATER

BANK STABILIZATION CLASS I RIP RAP EST. 8 TONS EST. 25 SYGF

(10) (10)Z GROUP VENTURES, INC. DB 857 PG 631 DB 1151 PG 453

SITE 4

SBA-P

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL BB

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

FOR -L- PROFILE, SEE SHEET 50 & 51

$$$$$$CYCTIME$$$$$$
$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$
$$$USERNAME$$$$
$$SCALE$$
$$ENVIRONMENT$$

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-4400BB	6C
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 12 OF 83

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83

IMPROVEMENTS WITH FLOODPLAIN BENCH
SEE DETAIL AB
CLASS I RIP RAP
EST. 73 TONS
EST. 16 SYGF

REMOVE EXIST. HW

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AB

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

0625 0627 0609 0610 0608 0607 0606 0628 0626 0605

15" RCP–IV
2GI–B FG
60" WELDED STEEL PIPE TRENCHLESS INSTALLATION
RETAIN NCDOT APPROVED LINER
REMOVE
TB2GI
2GI–B SG
15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS
PLUG & FILL w/ FLOWABLE FILL
REMOVE EXIST. HW
CULVERT CHANNEL IMPROVEMENTS WITH FLOODPLAIN BENCH
SEE DETAIL AA
CLASS I RIP RAP
EST. 73 TONS
EST. 40 SYGF
CLASS 'B' RIPRAP
EST. 60 TONS
EST. 277 SYGF
TEMP. IMPACTS IN SURFACE WATER
IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AA
BANK STABILIZATION

I-26 EB 38' CONC
I-26 WB 36' CONC
36" EXPRESSWAY C&G
48" WW & ISBW
5' CMP
12" CMP
18" CMP
MTL
R/W MON
DI

+10.00 –L– 175.84' LT 195.00' RT
+10.00 –L– 195.00' RT 210.00' RT
+50.00 –L– 170.00' RT 195.00' RT
+75.00 –L–

SITE 4 | SBA–1

20' 0' 20' 40' 60'
GRAPHIC SCALE

REVISIONS

$$$$$$$SYSTIME$$$$$
$$$$$$$

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Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	6D
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 13 OF 83

REVISIONS

NAD 83

SITE 3 SBA-1

IMPROVEMENTS WITH FLOODPLAIN BENCH
SEE DETAIL AB
CLASS I RIP RAP
EST. 73 TONS
EST. 16 SYGF

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AB

REMOVE EXIST. HW

HW

S

60" WELDED STEEL PIPE

RETAIN NCDOT & APPROVED LINER WITH TRENCHLESS INSTALLATION

REMOVE

8" PVC

15" RCP-IV

2GI-B FG

2GI-B SG

TB2GI

REMOVE

15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

PLUG & FILL w/ FLOWABLE FILL

I-26 EB 38" CONC

I-26 WB 36" CONC

36" EXPRESSWAY C&G

48" WW & SBW

5" CMP

SHOULDER DRAIN

MTL

DI

R/W MON

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES IMPACTS IN SURFACE WATER

SITE 4 SBA-1

CLASS 'B' RIPRAP
EST. 46 TONS
EST. 277 SYGF

CULVERT CHANNEL IMPROVEMENTS WITH FLOODPLAIN BENCH
SEE DETAIL AA
CLASS I RIP RAP
EST. 73 TONS
EST. 40 SYGF

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL BB

PDE

E

+10.00 -L-
195.00' RT
210.00' RT
BANK STABILIZATION

+75.00 -L-

GRAPHIC SCALE
20' 0' 20' 40' 60'

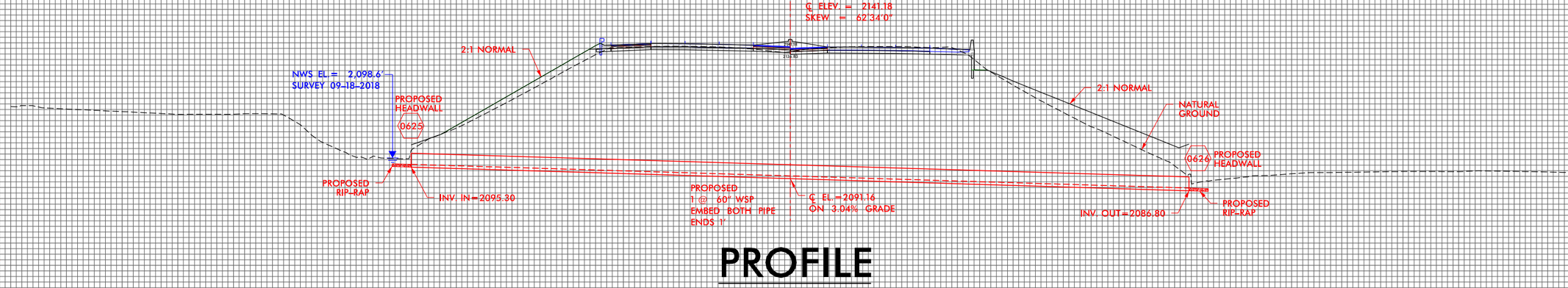
GROUP VENTURES, INC.
DB 857, PG 631

$$$$$$SYSTIME$$$$$
$$$$$$

6/23/16

PROJ. REFERENCE NO.	SHEET NO.
I-4400BB	6E

PERMIT DRAWING
SHEET 14 OF 83



PROFILE

HENDERSON COUNTY
PROJECT: I-4400BB
I-26
I-26 BETWEEN US 64 (CHIMNEY ROCK ROAD)
TO WEST OF NAPLES ROAD (SR1534)

$$$$ SYSTIME $$$$ SYSWELL $$$$ SYSCELL $$$$ SYSLEVEL $$$$ SYSCONFIG $$$$

WETLAND & STREAM IMPACTS

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (BANK STABILIZATION) 263 LF SEE PERMIT DRAWING SHEET 2 OF 83

SOIL CHOKED RIP RAP (TYP)

IMPACTS IN SURFACE WATER (BANK STABILIZATION) 308 LF SEE PERMIT DRAWING SHEET 2 OF 83

NAD 83

SBB–I

SBD–P

SBC–P

SITE 5

SITE 6

SITE 7

CLEAR CREEK

ALLEN BRANCH

CAROLINA VILLAGE, INC. DB 1341 PG 582 DB 1077 PG 350

HEATHER C. FERNANDEZ DB 1498 PG 321

GROUP VENTURES, INC. DB 857 PG 631 DB 1051 PG 453

PLUG & FILL w/ FLOWABLE FILL

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

15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

REMOVE EXIST. DI

REMOVE

FS SEE DETAIL O

CLASS 'B' RIPRAP EST. 36 TONS EST. 81 SYGF

CLASS 1 RIPRAP EST. 4 TONS EST. 12 SYGF

24" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

30" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

BANK STABILIZATION CLASS 1 RIPRAP EST 7 TONS EST 17 SYGF

BANK STABILIZATION CLASS 1 RIPRAP EST 2 TONS EST 6 SYGF

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AO

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AP

TEMP. IMPACTS IN SURFACE WATER

14' GREENWAY PATH

MATCHLINE SHEET 6 –L– STA 415+00.00

MATCHLINE SHEET 8 –L– STA 429+00.00

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

FOR –L– PROFILE, SEE SHEET 51 & 52

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PERMIT DRAWING SHEET 15 OF 83

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	7
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

$$$$$$SYSTIME$$$$$$
$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$
$$SCALE$$
$$ENVIRONMENT$$

WETLAND & STREAM IMPACTS

SS DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (BANK STABILIZATION) 263 LF SEE PERMIT DRAWING SHEET 2 OF 83

SOIL CHOKED RIP RAP (TYP)

IMPACTS IN SURFACE WATER (BANK STABILIZATION) 308 LF SEE PERMIT DRAWING SHEET 2 OF 83

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AO

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AP

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE PERMIT DRAWING SHEET 2 OF 83

TEMP. IMPACTS IN SURFACE WATER

14' GREENWAY PATH

SITE 5 SBC–P

SITE 6 SBD–P CLEAR CREEK

SITE 7 ALLEN BRANCH

MATCHLINE SHEET 6 –L– STA 415+00.00

MATCHLINE SHEET 8 –L– STA 429+00.00

CAROLINA VILLAGE, INC. DB 1341 PG 582 DB 1077 PG 350

HEATHER G. FERNANDEZ DB 1498 PG 321

GROUP VENTURES, INC. DB 857 PG 631 DB 1051 PG 453

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

FOR –L– PROFILE, SEE SHEET 51 & 52

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

PERMIT DRAWING SHEET 16 OF 83

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

$$$$$$CYCTIME$$$$$$
$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$
$$SCALE$$
$$ENVIRONMENT$$

HNTB NORTH CAROLINA, P.C.
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NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	7C
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 17 OF 83

NAD 83

SBB–I

IMPACTS IN SURFACE WATER (BANK STABILIZATION) 263 LF SEE PERMIT DRAWING SHEET 2 OF 83

PLUG & FILL w/ FLOWABLE FILL

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

15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

SITE 6

CLEAR CREEK

SBD–P

SOIL CHOKED RIP RAP (TYP)

IMPACTS IN SURFACE WATER (BANK STABILIZATION) 308 LF SEE PERMIT DRAWING SHEET 2 OF 83

SITE 6

CLEAR CREEK

PLUG & FILL w/ FLOWABLE FILL

FS SEE DETAIL O

2GI–B FG

2GI–B SG

15" RCP–IV

REMOVE

TB2GI

TB2GI–A

2GI–A SG

24" RCP–IV

30" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

BANK STABILIZATION CLASS I RIPRAP EST 2 TONS EST 6 SYGF

SITE 5

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AO

BANK STABILIZATION CLASS I RIPRAP EST 7 TONS EST 17 SYGF

SBC–P

TEMP. IMPACTS IN SURFACE WATER

14' GREENWAY PATH

SITE 7

ALLEN BRANCH

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE PERMIT DRAWING SHEET 2 OF 83

TEMP. IMPACTS IN SURFACE WATER

SITE 6

SBD–P

CLEAR CREEK

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AP

TEMP. IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

+60.00 –L– 188.67' RT 205.00' RT

+90.00 –L– 188.83' RT 205.00' RT

GRAPHIC SCALE 30' 0' 30' 60' 90'

FOR –L– PROFILE, SEE SHEET 51 & 52

GROUP VENTURES, INC. DB 857 PG 631

$$$$$$SYSTIME$$$$$
$$$$$$

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-4400BB	7D
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 18 OF 83

SBB–I

IMPACTS IN SURFACE WATER (BANK STABILIZATION) 263 LF SEE PERMIT DRAWING SHEET 2 OF 83

PLUG & FILL w/ FLOWABLE FILL

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

15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

SITE 6

CLEAR CREEK

SBD–P

SOIL CHOKED RIP RAP (TYP)

IMPACTS IN SURFACE WATER (BANK STABILIZATION) 308 LF SEE PERMIT DRAWING SHEET 2 OF 83

NAD 83

PLUG & FILL w/ FLOWABLE FILL

FS SEE DETAIL O

0719 0720 0721 0745 0746 0717 0716 0740 0737 0705 0704 0707 0709 0702 0703 0714 0718 0742 0708 0736 0743 0701 0713

2GI–B SG 2GI–B FG TB2GI TB2GI–A 2GI–A SG

15" RCP–IV 24" RCP–IV 30" RCP–IV

REMOVE

I–26 EB 38" CONC I–26 WB 38" CONC

48" WW & ISBW

SITE 5

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AO

BANK STABILIZATION CLASS I RIPRAP EST 7 TONS EST 17 SYGF

SBC–P

TEMP. IMPACTS IN SURFACE WATER

SITE 7

ALLEN BRANCH

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE PERMIT DRAWING SHEET 2 OF 83

14' GREENWAY PATH

TEMP. IMPACTS IN SURFACE WATER

CLEAR CREEK

30" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

BANK STABILIZATION CLASS I RIPRAP EST 2 TONS EST 6 SYGF

SITE 6

SBD–P

CLEAR CREEK

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AP

TEMP. IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

+60.00 –L– 188.67' RT 205.00' RT

+90.00 –L– 188.83' RT 205.00' RT

GROUP VENTURES, INC. DB 857 PG 631

GRAPHIC SCALE 30' 0' 30' 60' 90'

FOR –L– PROFILE, SEE SHEET 51 & 52

$$$$$$$CYCTIME$$$$$
$$$$$$$

6/23/16

PROJ. REFERENCE NO.	SHEET NO.
I-4400BB	7E

PERMIT DRAWING
SHEET 19 OF 83

419+00 420+00 421+00 422+00 423+00 424+00 425+

LE GRADE
PGL)

BEGIN BRIDGE OVER CLEAR CREEK –L– STA 420+23.91

℄ BRIDGE STA. = 421+74.7 –L–
1@76'; 1@95'; 1@76'
CONCRETE FLOOR ON I-BEAMS
54" GIRDERS WITH 4' DEEP CAPS
SKEW = 90°16' 59"
CROWN GRADE ELEV. =
2121.5' –WBL–
2133.3' –EBL–

END BRIDGE OVER CLEAR CREEK –L– STA 423+24.68

NATUR

LOWEST LOW CHORD: –WBL– 2117.14'
–EBL– 2119.29'

EXISTING GROUND

2130 2130

2110 2110

CLASS II RIP RAP
2' THICK

EXCAVATE TO ELEVATION 2083.00'

14' BENCH FOR FUTURE GREENWAY PATH

CLEAR CREEK

Q_{50} EL. = 2082.7'

HISTORIC HIGH
WSEL = 2084.18'
10/4/1964
Q_{100} EL. = 2083.9'

NATURAL GROUND (LT)

2090 2090

NORMAL
WSEL = 2068'
9/14/18

2070 2070

3'6" (TYP.)

CLASS II RIP RAP
2' THICKNESS

THEORITICAL 100-YR SCOUR

THEORITICAL 500-YR SCOUR

2060 2060

PROFILE

HENDERSON COUNTY
PROJECT: I-4400BB
I-26

$$$$SYSTIME$$$$
$$$$DGN$$$$
$$$$USERNAME$$$$
$$$$XREFS$$$$
$$$$DGNJ$$$$

WETLAND & STREAM IMPACTS

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

MATCHLINE SHEET 25 –Y3– STA 14+00.00

MATCHLINE SHEET 25 –Y2– STA 16+00.00

MATCHLINE SHEET 7 –L– STA 429+00.00

MATCHLINE SHEET 9 –L– STA 443+00.00

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PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	8

R/W SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 20 OF 83

NAD 83

REVISIONS

HEATHER G. FERNANDEZ
DB 1498 PG 321

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

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

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

15" CSP W/ ELBOWS AND ROD AND LUG CONNECTIONS

LATERAL BASE DITCH SEE DETAIL T

LATERAL BASE DITCH SEE DETAIL V

LATERAL BASE DITCH SEE DETAIL AG

PLUG & FILL w/ FLOWABLE FILL

SEE DETAIL N

SEE DETAIL O

SINGLE SLOPE CONC. BARRIER

I-26 WB 37.5° CONC

I-26 EB 38° CONC

I-26 WB 38° CONC

48" WW & ISBW

TEMP. IMPACTS IN SURFACE WATER

SITE 25
SBE–I

SITE 9
SBE–I

BANK STABILIZATION CLASS B RIP RAP EST. 7 TONS EST. 19 SYGF

TRENCHLESS INSTALLATION 30" WELDED STEEL

CLASS 'I' RIPRAP BANKS ONLY SEE DETAIL S

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL S

IMPACTS IN SURFACE WATER (42" WSP)

CLASS 'B' RIPRAP EST. 5 TONS EST. 5 SYGF FILL EXISTING SCOUR HOLE

CLASS 'I' RIPRAP EST. 7 TONS EST. 17 SYGF

FOR –L– PROFILE, SEE SHEET 52 & 53
FOR –Y2– PROFILE, SEE SHEET 85
FOR –Y3– PROFILE, SEE SHEET 86

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

$$$$$$SYSTIME$$$$$
$$$$$$

WETLAND & STREAM IMPACTS

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

MATCHLINE SHEET 25 –Y3– STA 14+00.00

MATCHLINE SHEET 25 –Y2– STA 16+00.00

MATCHLINE SHEET 7 –L– STA 429+00.00

MATCHLINE SHEET 9 –L– STA 443+00.00

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-4400BB	8

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 21 OF 83

REVISIONS

NAD 83

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

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

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

LATERAL BASE DITCH SEE DETAIL T

LATERAL BASE DITCH SEE DETAIL AG

LATERAL BASE DITCH SEE DETAIL V

PLUG & FILL w/ FLOWABLE FILL

15" CSP W/ELBOWS AND ROD AND LUG CONNECTIONS

REMOVE

RETAIN

HEATHER C. FERNANDEZ DB 1498 PG 321

TEMP. IMPACTS IN SURFACE WATER

SITE 25 SBE–I

SITE 9 SBE–I

BANK STABILIZATION CLASS B RIP RAP EST. 7 TONS EST. 19 SYGF

TRENCHLESS INSTALLATION 30" WELDED STEEL

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

CLASS 'I' RIPRAP BANKS ONLY SEE DETAIL S

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL S

IMPACTS IN SURFACE WATER (42" WSP)

CLASS I RIPRAP EST. 7 TONS EST. 17 SYGF

FILL EXISTING SCOUR HOLE

FOR –L– PROFILE, SEE SHEET 52 & 53
FOR –Y2– PROFILE, SEE SHEET 85
FOR –Y3– PROFILE, SEE SHEET 86

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

$$$$$$SYSTIME$$$$$
$$$$$$

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-4400BB	8C
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 22 OF 83

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

EST. 17 SYGF

NAD 83

SITE 25

SBE–I

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

TEMP. IMPACTS IN SURFACE WATER

LATERAL 'V' DITCH
SEE DETAIL H

24" BST

BM #46

BM #14

BANK STABILIZATION
CLASS B RIP RAP
EST. 7 TONS
EST. 19 SYGF

SITE 9

TEMP. IMPACTS IN SURFACE WATER

SBE–I

TRENCHLESS INSTALLATION 42" WELDED STEEL

PDE

HW

JS REMOVE

TEMP. IMPACTS IN SURFACE WATER

PDE

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

PDE

PDE

15" CSP

2GI–B SG

FS
SEE DETAIL O

CLASS 'I' RIPRAP
BANKS ONLY
SEE DETAIL S

PLUG & FILL w/
FLOWABLE FILL

IMPACTS IN SURFACE WATER
(BANK STABILIZATION)
SEE DETAIL S

IMPACTS IN SURFACE WATER
(42" WSP)

CONCRETE DITCH TRANSITION
STA. 440+75.00
ELEV.= 2,130.00

STA. 440+65.00
ELEV.= 2,133.21

20' 0' 20' 40' 60'
GRAPHIC SCALE

EXISTING R/W

42" CMP

MTL

MAG NAIL

CONC CL

CNAIL

FOR –L– PROFILE, SEE SHEET 52 & 53
FOR –Y2– PROFILE, SEE SHEET 85
FOR –Y3– PROFILE, SEE SHEET 86

$$$$$$$SYSTIME$$$$$
$$$$$$$

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PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	8D
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 23 OF 83

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

NAD 83

EST. 17 SYGF

LATERAL 'V' DITCH
SEE DETAIL H

SITE 25

SBE–I

TEMP. IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

BANK STABILIZATION
CLASS B RIP RAP
EST. 7 TONS
EST. 19 SYGF

SITE 9

TEMP. IMPACTS IN SURFACE WATER

SBE–I

TRENCHLESS INSTALLATION 42" WELDED STEEL

PDE

HW

JS REMOVE

TEMP. IMPACTS IN SURFACE WATER

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

CLASS 'I' RIPRAP
BANKS ONLY
SEE DETAIL S

PLUG & FILL w/ FLOWABLE FILL

15" CSP

2GI–B SG

FS
SEE DETAIL O

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL S

IMPACTS IN SURFACE WATER (42" WSP)

CONCRETE DITCH TRANSITION
STA. 440+75.00
ELEV.= 2,130.00

STA. 440+65.00
ELEV.= 2,133.21

20' 0' 20' 40' 60'
GRAPHIC SCALE

FOR –L– PROFILE, SEE SHEET 52 & 53
FOR –Y2– PROFILE, SEE SHEET 85
FOR –Y3– PROFILE, SEE SHEET 86

$$$$$$$CYCTIME$$$$$
$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$
$$SCALE$$
$$ENVIRONMENT$$

WETLAND & STREAM IMPACTS

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-4400BB	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 24 OF 83

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL AC

TEMP. IMPACTS IN SURFACE WATER

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (OUTLET PROTECTION) SEE DETAIL AQ

SITE 11 SBX-P

SITE 10 SBY-P

MATCHLINE SHEET 8 -L- STA 443+00.00

MATCHLINE SHEET 10 -L- STA 457+00.00

HEATHER G. FERNANDEZ
DB 1498 PG 321
DB 884 PG 453

JOSEPH B. GARREN
DB 437 PG 295

WILLIAM L. HARPER, JR.
DB 788 PG 147

GREGORIO M. AGUILLON
DB 775 PG 579

TCB PROPERTIES, LLC
DB 1647 PG 545

GLENN M. DUDAS
DB 1313 PG 232
DB 1082 PG 470

ROBERT H. STEPHENS, JR.
DB 1554 PG 569

SR 1635 HINDER FARM RD 20' BST

I-26 EB 37.5' CONC

I-26 WB 37.5' CONC

36' EXPRESSWAY C&G

2GI-B FG

15" RCP-IV

TB2GI

REMOVE

TBJB w/MH

18" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

PLUG & FILL w/ FLOWABLE FILL

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

CLASS I RIPRAP EST. 21 TONS EST. 42 SYGF

CLASS I RIPRAP EST. 11 TONS EST. 22 SYGF

CLASS I RIPRAP EST. 15 TONS EST. 30 SYGF

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

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

2GI-A SG

TRENCHLESS INSTALLATION WELDED STEEL

HW

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

FOR -L- PROFILE, SEE SHEET 53 & 54

$$$$$$SYSTIME$$$$$
$$$$$$

WETLAND & STREAM IMPACTS

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

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PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 25 OF 83

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

NAD 83

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL AC

TEMP. IMPACTS IN SURFACE WATER

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (OUTLET PROTECTION) SEE DETAIL AQ

SITE 11 SBX–P

SITE 10 SBY–P

MATCHLINE SHEET 8 –L– STA 443+00.00

MATCHLINE SHEET 10 –L– STA 457+00.00

HEATHER G. FERNANDEZ DB 1498 PG 321 DB 884 PG 453

JOSEPH B. GARREN DB 432 PG 295

GREGORIO M. AGUILLON DB 775 PG 579

WILLIAM L. HARPER, JR. DB 788 PG 147

TCB PROPERTIES, LLC DB 1647 PG 545

GLENN M. DUDAS DB 1313 PG 232 DB 1082 PG 470

ROBERT H. STEPHENS, JR. DB 1554 PG 569

SR 1635 HINDER FARM RD 20' BST

I-26 EB 37.5' CONC

I-26 WB 37.5' CONC

36" EXPRESSWAY

CLASS I RIPRAP EST. 15 TONS EST. 30 SYGF

CLASS I RIPRAP EST. 11 TONS EST. 22 SYGF

CLASS I RIPRAP EST. 1 TONS EST. 5 SYGF

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

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

PLUG & FILL w/ FLOWABLE FILL

15" CSP W/ELBOWS AND ROD AND LUG CONNECTORS

18" CSP W/ELBOWS AND ROD AND LUG CONNECTORS

TBJB w/MH

FRANCHISES INSTALLATION OF 36" WELDED STEEL

REMOVE

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

FOR –L– PROFILE, SEE SHEET 53 & 54

$$$$$$$SYSTIME$$$$$
$$$$$$$

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PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	9C
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING SHEET 26 OF 83

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SITE 11 SBX–P

SITE 10 SBY–P

NAD 83

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

Sta. = 456+00 to 458+50 – L – LT
Q = 3.46
V =
n = 0.035
Liner: CLASS B

TEMP. IMPACTS IN SURFACE WATER

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (OUTLET PROTECTION) SEE DETAIL AQ

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL AC

CLASS I RIPRAP EST 21 TONS EST 47 SYGF

PLUG & FILL w/ FLOWABLE FILL

CLASS I RIPRAP EST 11 TONS EST. 22 SYGF

CLASS B RIPRAP EST. 1 TONS EST. 5 SYGF

PLUG & FILL w/ FLOWABLE FILL

SEE ROCK PLATING DETAIL ON SHEET 2G-2

SR 1635 HYDER FARM RD 19' BS

JOSEPH B. GARREN DB 437 PG 295

REMOVE

15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

15" RCP–IV

2GI–B FG

2GI–A SG

30" RCP–IV

54" RCP–IV

54" WELDED STEEL PIPE TRENCHLESS INSTALLATION

TB2GI

HW

PDE

TRENCHLESS INSTALLATION

36" EXPRESSWAY C&G

I-26 EB 37.5' CONC

I-26 WB 37.5' CONC

42" PMP

BM #15

ROBERT H. STEPHENS, JR. DB 1554 PG 569

FOY F. GARREN

2SFD

9' GR

15" CMP

N 85°12'43" E 225.16'

S 83°44'09" E 319.08'

1.93'

EIP

R/W MON

BST

MTL

SEE ROCK PLATING DETAIL ON SHEET 2G-2

30' 0' 30' 60' 90'
GRAPHIC SCALE

REVISIONS

$$$$$$$SYSTIME$$$$$$
$$$$$$$

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NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	9D
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 27 OF 83

SITE 11 SBX–P

SITE 10 SBY–P

NAD 83

TS TS
S S

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES IMPACTS IN SURFACE WATER

TEMP. IMPACTS IN SURFACE WATER

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (OUTLET PROTECTION) SEE DETAIL AQ

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL AC

Sta. = 456+00 to 458+50 – L – LT
Q = 3.46
V =
n = 0.035
Liner = CLASS B

CLASS I RIPRAP
EST 21 TONS
EST 47 SYGF

PLUG & FILL w/ FLOWABLE FILL

CLASS I RIPRAP
EST. 11 TONS
EST. 22 SYGF

CLASS I RIPRAP
EST. 1 TONS
EST. 5 SYGF

PLUG & FILL w/ FLOWABLE FILL

REMOVE

30" RCP-IV

54" RCP-IV

54" WELDED STEEL PIPE TRENCHLESS INSTALLATION

15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

15" RCP-IV

2GI_A SG

2GI_B FG

TB2GI

HW

PDE

JOSEPH B. GARREN
DB 437 PG 295

SR 1635 HYDER FARM RD 19' BST

SEE ROCK PLATING DETAIL ON SHEET 2G-2

I-26 EB 37.5' CONC

I-26 WB 37.5' CONC

PROPOSED GUARDRAIL

ROBERT H. STEPHENS, JR.
DB 1554 PG 569

ROY F. GARREN

GRAPHIC SCALE
30' 0' 30' 60' 90'

$$$$$$SYSTIME$$$$$
$$$$$$

WETLAND & STREAM IMPACTS

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-4400BB	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 28 OF 83

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

NAD 83

MATCHLINE SHEET 11
–L– STA 485+00.00

MATCHLINE SHEET 13
–L– STA 499+00.00

BEVERLY L. KILLOUGH, ET AL
DB 3144 PG 703

HRR PROPERTIES, LLC
DB 1599 PG 652

G. RAY FUSSELL
DB 1254 PG 107

RICHARD F. MIHALIK
DB 761PG 243

MITCHELL G. BULLINGTON
DB 1500 PG 371

PERMANENT IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AI

PERMANENT IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AJ

TEMP. IMPACTS IN SURFACE WATER

TEMP. IMPACTS IN SURFACE WATER

SBG–P

SITE 40

SBH–I

SITE 38

SBF–P

SITE 39

TOE PROTECTION SEE DETAIL E EST. 54 TONS EST. 217 SYGF

TOE PROTECTION SEE DETAIL E

PLUG & FILL w/ FLOWABLE FILL

CLASS 'B' RIPRAP EST. 81 TONS EST. 142 SYGF

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

18" CSP W/ELBOWS AND ROD AND LUG CONNECTORS

15" CSP W/ELBOWS AND ROD AND LUG CONNECTORS

36" WELDED STEEL PIPE TRENCHLESS INSTALLATION

CLASS 'I' RIPRAP EST. 7 TONS EST. 15 SYGF

STANDARD BASE DITCH SEE DETAIL Y EST. 15 CY DDE

CLASS 'I' RIPRAP EST. 7 TONS EST. 17 SYGF

FOR –L– PROFILE, SEE SHEET 56 & 57

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

$$$$$$SYSTIME$$$$$
$$$$$$

WETLAND & STREAM IMPACTS

S/S DENOTES IMPACTS IN SURFACE WATER

TS/TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

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Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 29 OF 83

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83

REVISIONS

MATCHLINE SHEET 11
–L– STA 485+00.00

MATCHLINE SHEET 13
–L– STA 499+00.00

PERMANENT IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AI

TOE PROTECTION SEE DETAIL E EST. 54 TONS EST. 217 SYGF

PLUG & FILL w/ FLOWABLE FILL

CLASS 'B' RIPRAP EST. 81 TONS EST. 142 SYGF

TOE PROTECTION SEE DETAIL E

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

SBG–P

SITE 40

18" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

15" CSP W/ELBOWS AND ROD AND LUG CONNECTORS

REMOVE

24" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

CLASS I RIPRAP EST. 7 TONS EST. 15 SYGF

STANDARD BASE DITCH SEE DETAIL Y EST. 15 CY DDE

CLASS 'I' RIPRAP EST. 7 TONS EST. 17 SYGF

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

SBG–P

SBH–I

SBG–P

SITE 38

SBF–P

SITE 39

TEMP. IMPACTS IN SURFACE WATER

PERMANENT IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AJ

TEMP. IMPACTS IN SURFACE WATER

PERMANENT IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AJ

BEVERLY L. KILLOUGH, ET AL
DB 3144 PG 703

HRR PROPERTIES, LLC
DB 1598 PG 652

G. RAY FUSSELL
DB 1254 PG 107

RICHARD F. MIHALIK
DB 761PG 243

MITCHELL G. BULLINGTON
DB 1500 PG 371

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

FOR –L– PROFILE, SEE SHEET 56 & 57

$$$$SYSTIME$$$$
$$$$USERNAME$$$$
$$$$SCALE$$$$
$$ENVIRONMENT$$

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Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	I2C
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 30 OF 83

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

NAD 83

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

HRR PROPERTIES, LLC
DB 1599 PG 652

PERMANENT IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AI

TOE PROTECTION SEE DETAIL E

SBG–P

SITE 40

CLASS 'B' RIPRAP
EST. 81 TONS
EST. 142 SYGF

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

18" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

REMOVE

PLUG FLOW

2GI–B FG

18" RCP–IV

15" RCP–IV

TB2GI

RETAIN

PSH

12" CMP

15" CMP

36" EXPRESSWAY C&G

MTL

CONC

DI

10' SOIL

JS

PLUG & FILL w/ FLOWABLE FILL

SBG–P

SITE 38

SBF–P

SITE 39

TEMP. IMPACTS IN SURFACE WATER

PERMANENT IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AJ

TEMP. IMPACTS IN SURFACE WATER

PERMANENT IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AJ

G. RAY FUSSELL
DB 1254 PG 107

RICHARD F. MIHALIK
DB 761 PG 243

MITCHELL G. BULLINGTON

48" WW & ISBW

0.85 EIR

36" WELDED STEEL TRENCHLESS INSTALL

REMOVE INV=2066.7 HW

PLUG & FLOWABLE

GRAPHIC SCALE 30' 0' 30' 60' 90'

FOR –L– PROFILE, SEE SHEET 56 & 57

$$$$$$$SYSTIME$$$$$
$$$$$$$

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Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	12D
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 31 OF 83

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

NAD 83

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

HRR PROPERTIES, LLC
DB 1599 PG 652

PERMANENT IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AI

TOE PROTECTION SEE DETAIL E

SBG–P

SITE 40

PSH

CLASS 'B' RIPRAP
EST. 81 TONS
EST. 142 SYGF

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

18" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

REMOVE

15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

2GI–B FG

15" RCP–IV

18" RCP–IV

36" EXPRESSWAY C&G

PLUG & FILL w/ FLOWABLE FILL

TB2GI

36" WELDED STEEL TRENCHLESS INSTALL

SBG–P

SITE 38

SBF–P

SITE 39

TEMP. IMPACTS IN SURFACE WATER

PERMANENT IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AJ

G. RAY FUSSELL
DB 1254 PG 107

RICHARD F. MIHALIK
DB 761 PG 243

MITCHELL G. BULLINGTON

30' 0' 30' 60' 90'
GRAPHIC SCALE

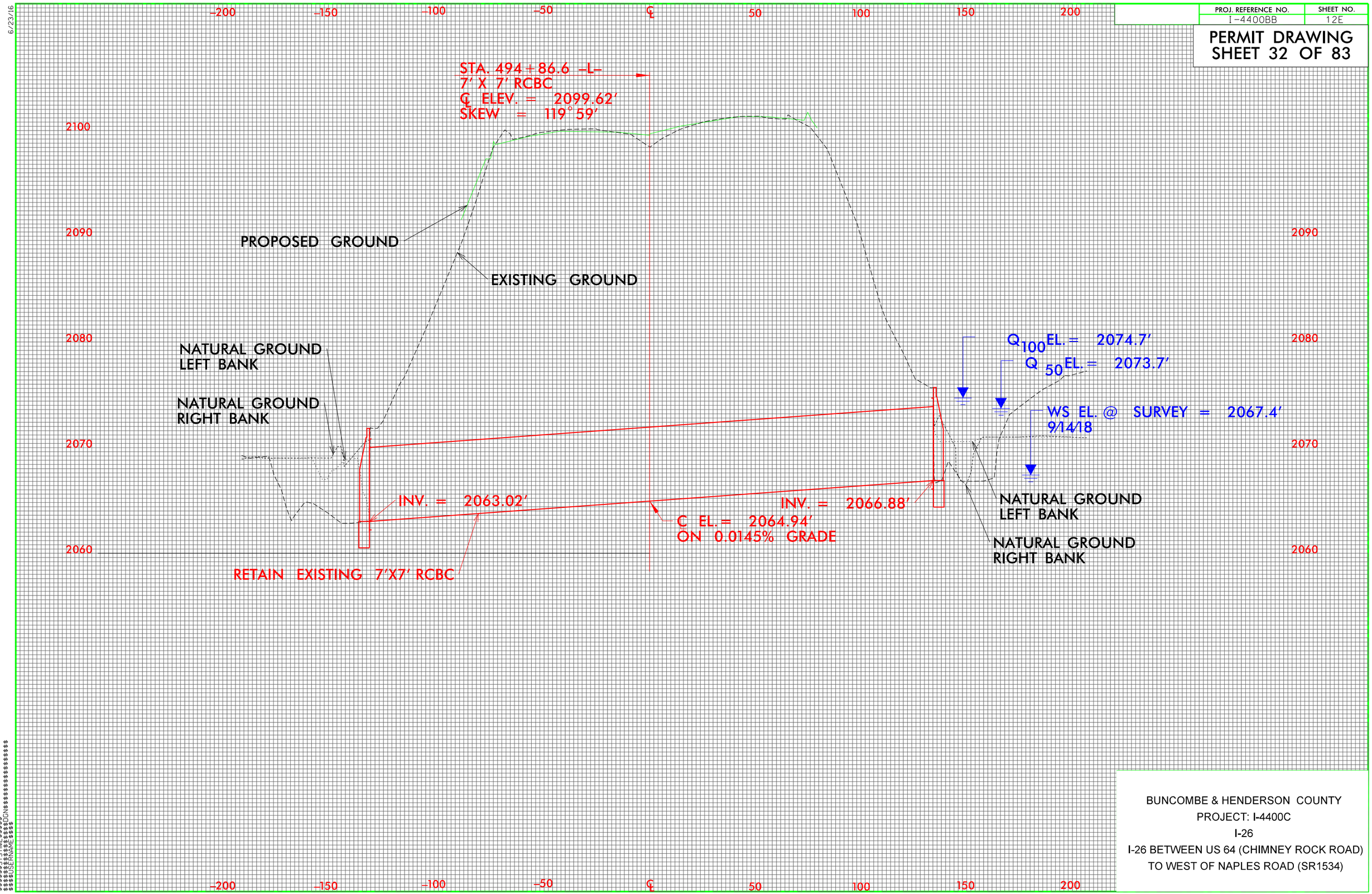
FOR –L– PROFILE, SEE SHEET 56 & 57

$$$$$$SYSTIME$$$$$$
$$$$$$

6/23/16

PROJ. REFERENCE NO.	SHEET NO.
I-4400BB	12E

PERMIT DRAWING
SHEET 32 OF 83



BUNCOMBE & HENDERSON COUNTY
PROJECT: I-4400C
I-26
I-26 BETWEEN US 64 (CHIMNEY ROCK ROAD)
TO WEST OF NAPLES ROAD (SR1534)

$$$$$SYSTIME$$$$$
$$$$$USERNAME$$$$$
$$$$$USERPROFILE$$$$$
$$$$$MYFILES$$$$$

WETLAND & STREAM IMPACTS

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

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Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

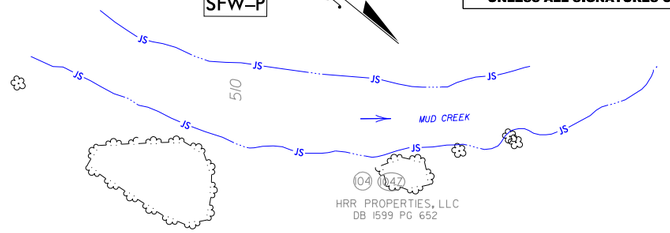
PERMIT DRAWING SHEET 33 OF 83

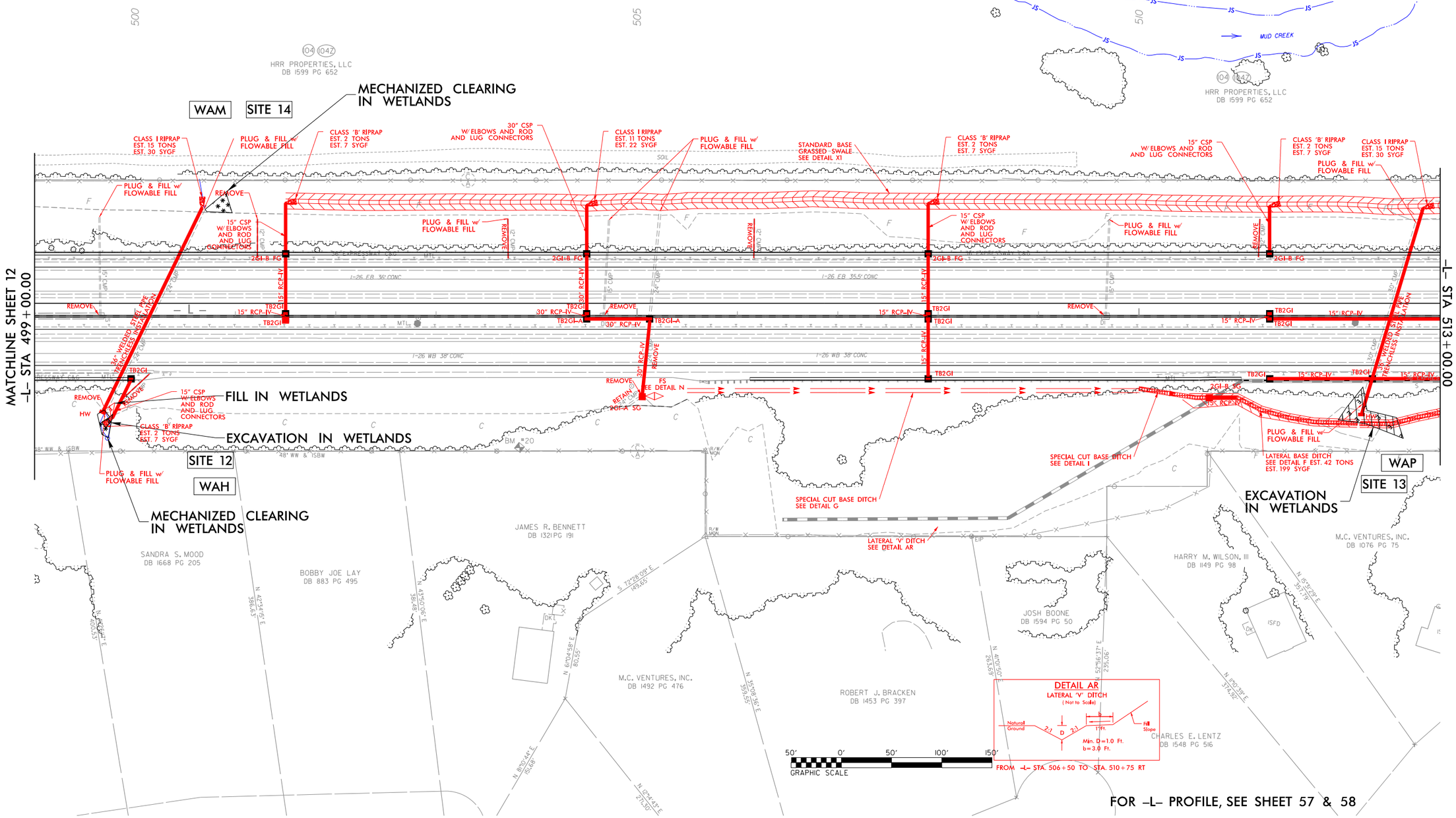
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

NAD 83

SFW-P





$$$$$$SYSTIME$$$$$
$$$$$$

WETLAND & STREAM IMPACTS

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

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-4400BB	13
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 34 OF 83

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83

SFW-P

MECHANIZED CLEARING IN WETLANDS

WAM SITE 14

MUD CREEK

HRR PROPERTIES, LLC
DB 1599 PG 652

CLASS I RIPRAP EST. 15 TONS EST. 30 SYGF

PLUG & FILL w/ FLOWABLE FILL

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

30" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

CLASS I RIPRAP EST. 11 TONS EST. 22 SYGF

STANDARD BASE GRASSED SWALE SEE DETAIL X1

15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

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

CLASS I RIPRAP EST. 15 TONS EST. 30 SYGF

REMOVE

2GI-B FG

15" RCP-IV

30" RCP-IV

TB2GI

TB2GI-A

I-26 EB 36" CONC

I-26 EB 35.5" CONC

I-26 WB 38" CONC

36" WELDED STEEL TYPE 7 TRENCHLESS INSTALLATION

24" CMP

30" CMP

15" CMP

MATCHLINE SHEET 12
-L- STA 499+00.00

MATCHLINE SHEET 14
-L- STA 513+00.00

15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

FILL IN WETLANDS

EXCAVATION IN WETLANDS

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

SITE 12

WAH

MECHANIZED CLEARING IN WETLANDS

RETAIN EXIST. DITCH

FS SEE DETAIL N

SPECIAL CUT BASE DITCH SEE DETAIL I

SPECIAL CUT BASE DITCH SEE DETAIL G

LATERAL 'V' DITCH SEE DETAIL AR

LATERAL BASE DITCH SEE DETAIL E EST. 42 TONS EST. 199 SYGF

WAP

SITE 13

EXCAVATION IN WETLANDS

SANDRA S. MOOD
DB 1668 PG 205

BOBBY JOE LAY
DB 883 PG 495

JAMES R. BENNETT
DB 1321 PG 191

M.C. VENTURES, INC.
DB 1492 PG 476

ROBERT J. BRACKEN
DB 1453 PG 397

JOSH BOONE
DB 1594 PG 50

HARRY M. WILSON, III
DB 1449 PG 98

M.C. VENTURES, INC.
DB 1076 PG 76

CHARLES E. LENTZ
DB 1548 PG 516

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

Natural Ground, 2:1, D, 2:1, b, 1'FF., Fill Slope
Min. D=1.0 Ft.
b=3.0 Ft.

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

FROM -L- STA. 506+50 TO STA. 510+75 RT

FOR -L- PROFILE, SEE SHEET 57 & 58

REVISIONS

$$$$$$SYSTIME$$$$$
$$$$$$

0 5 10

PROJ. REFERENCE NO.	SHEET NO.
I-4400BB	X-105

PERMIT DRAWING
SHEET 35 OF 83

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

2130
2120
2110
2100
2090
2080
2070
2060

2085.72 2086.53 2085.53 2085.54 2086.54 2082.66

0.040 0.020 0.020 0.020 0.040 0.040 0.020 0.020 0.020 0.040

2085.04

2:1 6:1 6:1

EX. ROW

500+50.00

2130
2120
2110
2100
2090
2080
2070
2060

FILL IN WETLANDS
EXCAVATION IN WETLANDS
MECHANIZED CLEARING IN WETLANDS

2086.46 2087.27 2086.27 2086.28 2087.28 2086.38

0.040 0.020 0.020 0.020 0.040 0.040 0.020 0.020 0.020 0.040

2085.37

2:1 9.94:1

WLB WLB

EX. ROW

500+00.00

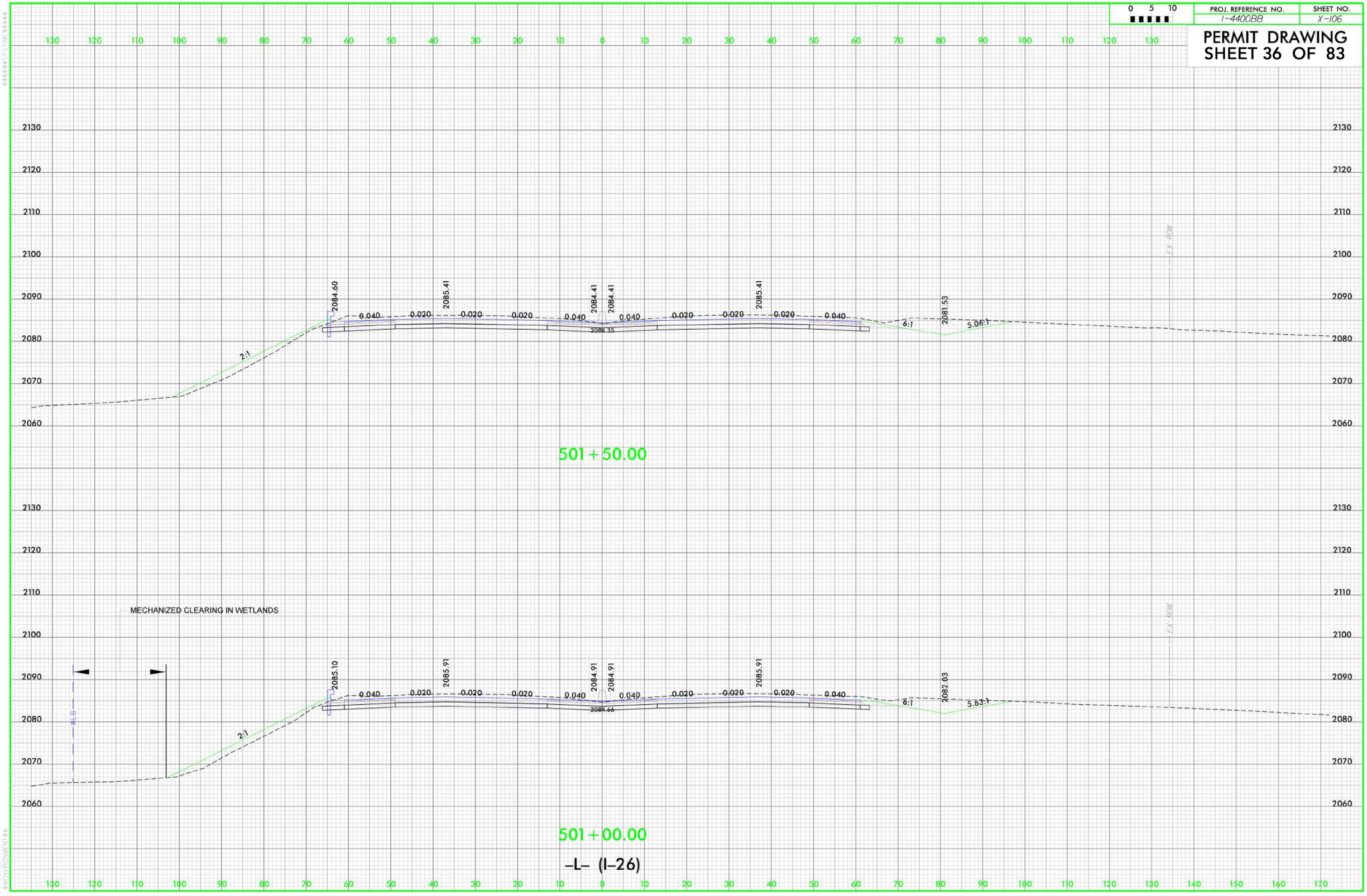
–L– (I–26)

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

$$PEN-TABLE$$
$$$

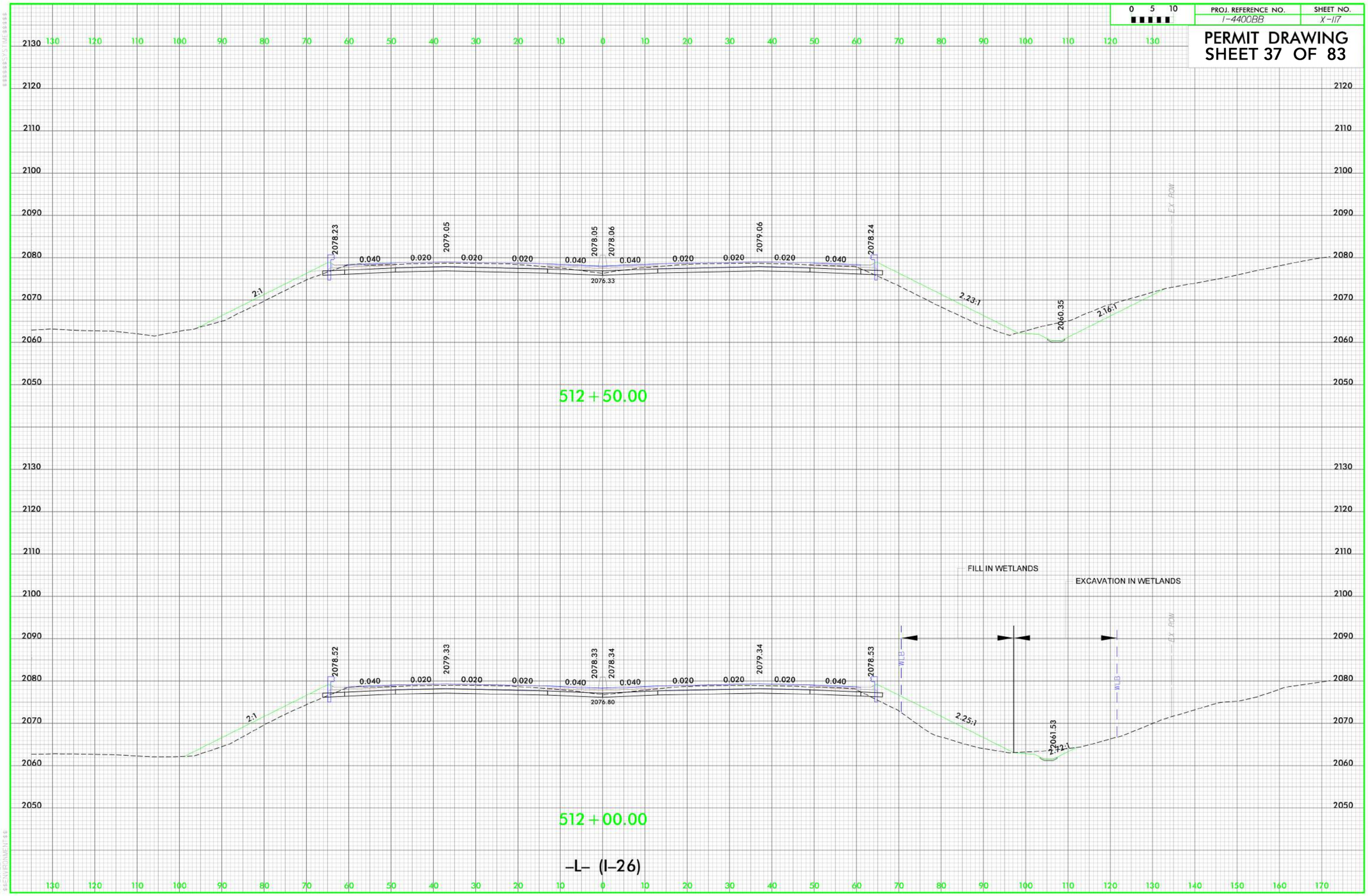
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	I-4400BB	X-106

PERMIT DRAWING
SHEET 36 OF 83



PROJ. REFERENCE NO.	SHEET NO.
I-4400BB	X-117

PERMIT DRAWING
SHEET 37 OF 83



S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

WETLAND & STREAM IMPACTS

NAD 83

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-4400BB	14

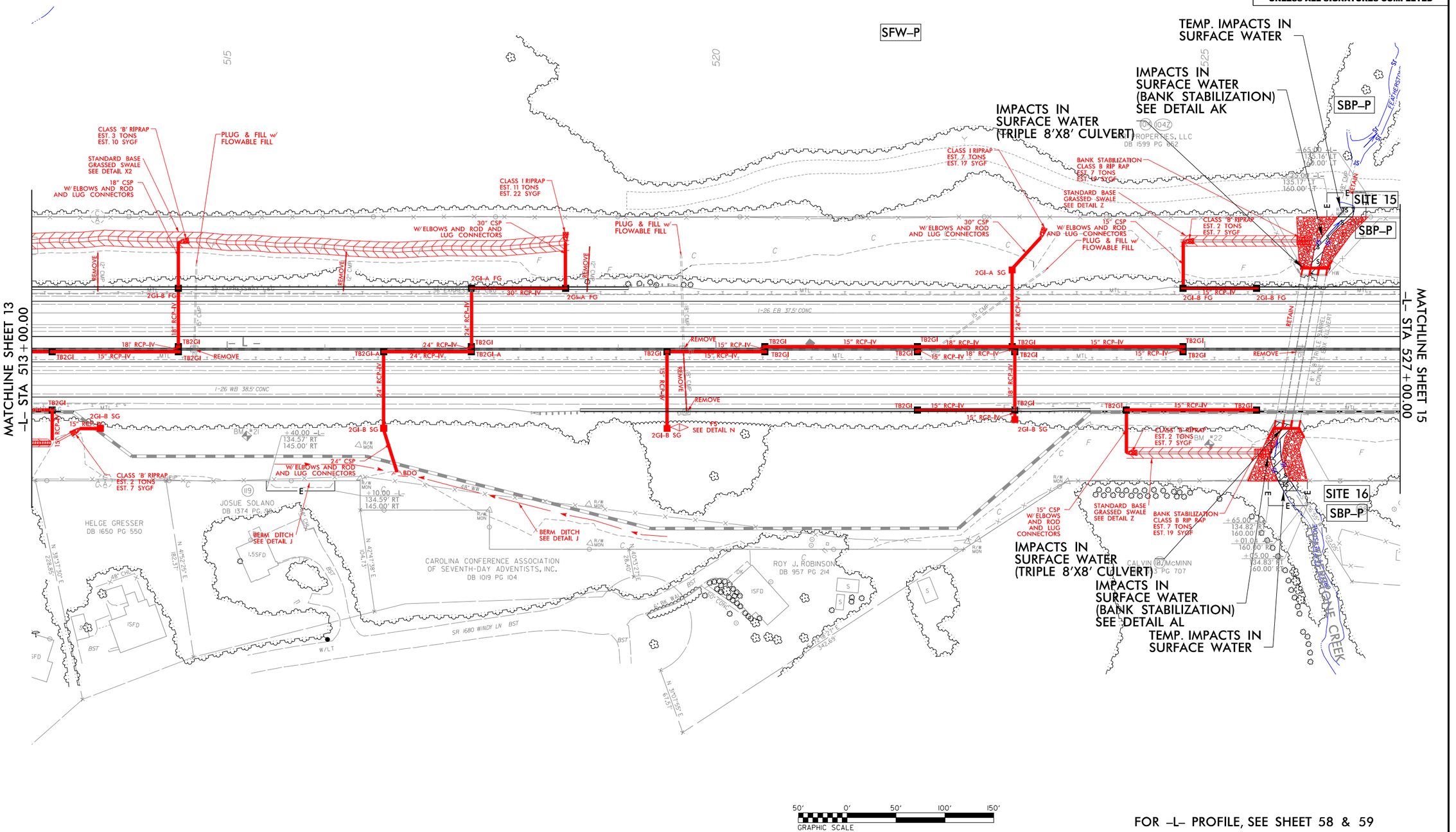
R/W SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 38 OF 83



FOR -L- PROFILE, SEE SHEET 58 & 59

$$$$$$SYSTIME$$$$$
$$$$$$

WETLAND & STREAM IMPACTS

SS 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

PERMIT DRAWING
SHEET 39 OF 83

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	14

R/W SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83

MATCHLINE SHEET 13 –L– STA 513+00.00

MATCHLINE SHEET 15 –L– STA 527+00.00

SFW–P

SBP–P

SITE 15

SITE 16

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AK

IMPACTS IN SURFACE WATER (TRIPLE 8'X8' CULVERT)

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AL

IMPACTS IN SURFACE WATER (TRIPLE 8'X8' CULVERT)

TEMP. IMPACTS IN SURFACE WATER

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

PLUG & FILL w/ FLOWABLE FILL

STANDARD BASE GRASSED SWALE SEE DETAIL X2

18" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

CLASS I RIPRAP EST. 11 TONS EST. 22 SYGF

30" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

CLASS I RIPRAP EST. 7 TONS EST. 19 SYGF

BANK STABILIZATION CLASS B RIP RAP EST. 7 TONS EST. 19 SYGF

15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

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

24" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

STANDARD BASE GRASSED SWALE SEE DETAIL Z

BERM DITCH SEE DETAIL J

STANDARD BASE GRASSED SWALE SEE DETAIL Z

BANK STABILIZATION CLASS B RIP RAP EST. 7 TONS EST. 19 SYGF

I-26 EB 37.5' CONC

I-26 WB 38.5' CONC

JOSHUE SOLANO DB 1374 PG 1

HELBE CRESSER DB 1650 PG 550

CAROLINA CONFERENCE ASSOCIATION OF SEVENTH-DAY ADVENTISTS, INC. DB 1019 PG 104

ROY J. ROBINSON DB 957 PG 214

CALVIN B. McMINN DB 3 PG 707

TOM (042) PROPERTIES, LLC DB 1599 PG 882

SE 1680 WINDY LN BST

N 390755.57 E 615.57

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

FOR –L– PROFILE, SEE SHEET 58 & 59

$$$$$SYSTIME$$$$$
$$$$$

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-4400BB	14C
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 40 OF 83

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

SITE 15 SBP–P

NAD 83

HRR PROPERTIES, LLC
DB 1599 PG 652

FEATHERSTONE CREEK

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AK

+65.00 –L– 135.16' LT 160.00' LT

+25.00 –L– 135.17' LT 160.00' LT

IMPACTS IN SURFACE WATER (TRIPLE 8'X8' CULVERT)

CLASS I RIPRAP EST. 7 TONS EST. 17 SYGF

BANK STABILIZATION CLASS B RIP RAP EST. 7 TONS EST. 19 SYGF

STANDARD BASE GRASSED SWALE SEE DETAIL Z

30" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

PLUG & FILL w/ FLOWABLE FILL

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

LATERAL BASE DITCH SEE DETAIL K1

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

LATERAL 'V' DITCH SEE DETAIL K2

CLASS I RIP EST. 11 TON EST. 22 SYG

30" RCP–IV

2GI–A SG

2GI–B FG

2GI–A FG

15" RCP–IV

24" RCP–IV

18" RCP–IV

TB2GI

REMOVE

RETAIN

8'X8' TRIPLE BARREL CONCRETE BOX CULVERT

48" CMP

15" CMP

2GI–B SG

CLASS B RIPRAP EST. 2 TONS EST. 7 SYGF

CLASS B RIPRAP EST. 5 TONS EST. 14 SYGF

4OTCB

DENISE E. BARNWELL
DB 1564 PG 306

CALVIN [illegible]
DB 553 PG 707

BM #22

S 34°37'59" E 192.50'

12" CMP

48" CHL

ISFD

W/L

SCALE: 1" = 30'
30' 0' 30' 60' 90'
GRAPHIC SCALE

SITE 16 SBP–P

FOR –L– PROFILE, SEE SHEET 58 & 59

$$$$$$SYSTIME$$$$$
$$$$$$

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-4400BB	14D
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 41 OF 83

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

SITE 15 SBP–P

HRR PROPERTIES, LLC
DB 1599 PG 652

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AK

+65.00 –L– 135.16' LT 160.00' LT

125.00 –L– 135.17' LT 160.00' LT

IMPACTS IN SURFACE WATER (TRIPLE 8'X8' CULVERT)

FEATHERSTONE CREEK

NAD 83

CLASS I RIPRAP EST. 7 TONS EST. 17 SYGF

BANK STABILIZATION CLASS B RIP RAP EST. 7 TONS EST. 19 SYGF

STANDARD BASE GRASSED SWALE SEE DETAIL Z

30" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

PLUG & FILL w/ FLOWABLE FILL

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

LATERAL BASE DITCH SEE DETAIL K1

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

LATERAL 'V' DITCH SEE DETAIL K2

15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

PLUG & FILL w/ FLOWABLE FILL

CLASS I RIP EST. 11 TON EST. 22 SYG

30" RCP–IV

2GI–A SG

2GI–B FG

2GI–A FG

24" RCP–IV

18" RCP–IV

15" RCP–IV

TB2GI

REMOVE

RETAIN

8'X8' TRIPLE BARREL CONCRETE BOX CULVERT

48" CMP

15" CMP

2GI–B SG

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

BANK STABILIZATION CLASS B RIP RAP EST. 7 TONS EST. 19 SYGF

+65.00 –L– 134.82' RT 160.00' RT

+01.04 –L– 160.00' RT

105.00 –L– 134.83' RT 160.00' RT

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AL

TEMP. IMPACTS IN SURFACE WATER

CALVIN (D.) MEMMA
DB 553 PG 707

DENISE E. BARNWELL
DB 1564 PG 306

IMPACTS IN SURFACE WATER (TRIPLE 8'X8' CULVERT)

S 34°37'59" E 192.50'

4OTCB

CLASS B RIPRAP EST. 5 TONS EST. 14 SYGF

SITE 16 SBP–P

GRAPHIC SCALE 30' 0' 30' 60' 90'

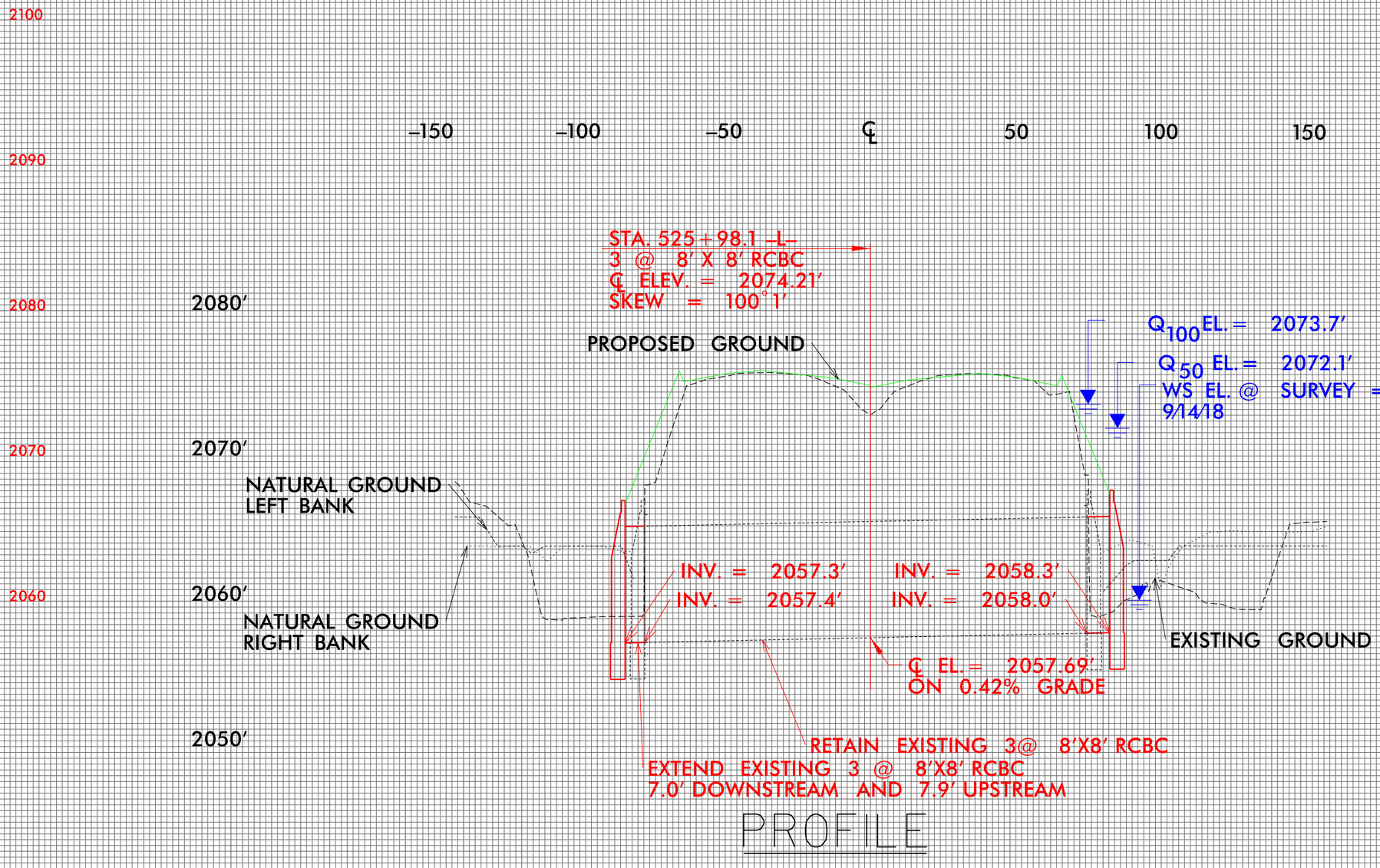
FOR –L– PROFILE, SEE SHEET 58 & 59

$$$$$$SYSTIME$$$$$
$$$$$$

6/23/16

PROJ. REFERENCE NO.	SHEET NO.
I-4400BB	12E

PERMIT DRAWING
SHEET 42 OF 83



PROFILE

BUNCOMBE & HENDERSON COUNTY
PROJECT: I-4400C
I-26
I-26 BETWEEN US 64 (CHIMNEY ROCK ROAD)
TO WEST OF NAPLES ROAD (SR1534)

$$$$SYSTIME$$$$
$$$$USERNAME$$$$
$$$$DATE$$$$
$$$$DRAWING$$$$

WETLAND & STREAM IMPACTS

DENOTES IMPACTS IN SURFACE WATER

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-4400BB	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 43 OF 83

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

MATCHLINE SHEET 27
-Y5- STA 14+75.00

MATCHLINE SHEET 15
-L- STA 539+00.00

MATCHLINE SHEET 17
-L- STA 553+00.00

MATCHLINE SHEET 28
-Y5- STA 24+25.00

NAD 83

SBR-I

TEMP. IMPACTS IN SURFACE WATER

SITE 17

PERMANENT IMPACTS IN SURFACE WATER (BANK STABILIZATION)

SBQ-I

SBN-I

TEMP. IMPACTS IN SURFACE WATER

SITE 19

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL AC

SBO-P

IMPACTS IN SURFACE WATER (60" WSP)

SITE 18

TEMP. IMPACTS IN SURFACE WATER

SBO-P

CHAMPIONS GOLF LEARNING CENTER, INC. DB 1567 PG 714

CLEMENT PAPPAS NC, INC. DB 1067 PG 68

NATHAN A. BENSON DB 568 PG 441

AARON K. SMITH DB 1517 PG 368

JOSHUA WALLACE DB 3022 PG 82

LEONA AMB DB 5?? PG 521

HEASLEY N. HIL DB 568 PG 451

ANTHONY G. BAILEY DB 829 PG 725

RUSSELL E. GIPE DB 523 PG 133

MARK N. CONTOMARINOS, ET AL DB 1188 PG 476

PAULA B. ROBERTS DB 1509 PG 431

MICHAEL C. HODGE DB 1619 PG 624

FOR -L- PROFILE, SEE SHEET 60 & 61
FOR -Y5- PROFILE, SEE SHEET 87

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

$$$$$$$$SYSTIME$$$$$
$$$$$$$$

WETLAND & STREAM IMPACTS

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83

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-4400BB	16
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 44 OF 83

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

MATCHLINE SHEET 27
-Y5- STA 14+75.00

SBR-I

TEMP. IMPACTS IN SURFACE WATER

SITE 17

TEMP. IMPACTS IN SURFACE WATER (BANK STABILIZATION)

SBQ-I

SBN-I

TEMP. IMPACTS IN SURFACE WATER

SITE 19

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL AC

SBO-P

MATCHLINE SHEET 15
-L- STA 539+00.00

MATCHLINE SHEET 17
-L- STA 553+00.00

IMPACTS IN SURFACE WATER (60" WSP)

SITE 18

TEMP. IMPACTS IN SURFACE WATER

SBO-P

MATCHLINE SHEET 28
-Y5- STA 24+25.00

FOR -L- PROFILE, SEE SHEET 60 & 61
FOR -Y5- PROFILE, SEE SHEET 87

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

$$$$$$$$SYSTIME$$$$$
$$$$$$$$

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-4400BB	16C
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 45 OF 83

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

$$$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$$$USERNAME$$$$$
$$SCALE$$
$$ENVIRONMENT$$

SITE 19
SBO–P

SITE 18
SBO–P

NAD 83

TEMP. IMPACTS IN SURFACE WATER
CLASS 'I' RIPRAP SEE DETAIL AC

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL AC

PLUG & FILL w/ FLOWABLE FILL

EST. 99 TONS
EST. 189 SYGF

TRENCHLESS INSTALLATION 66" WELDED STEEL

30" RCP–IV

REMOVE

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

TB2GI
15" RCP–IV
24" RCP–IV
2GI–B SG
2GI

IMPACTS IN SURFACE WATER (60" WSP)

TEMP. IMPACTS IN SURFACE WATER

PLUG & FILL w/ FLOWABLE FILL

GRAPHIC SCALE 20' 0' 20' 40' 60'

I-26 EB 45.5' CONC

MARY N. CONTOMARINOS, ET AL
DB 1188 PG 476

PAULA B ROBERTS

ONS GOLF LEARNING CENTER, INC.
DB 1567 PG 714

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-4400BB	I6D
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 46 OF 83

REVISIONS

$$$$$$$CYCTIME$$$$$
$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$USERNAME$$$$
$$SCALE$$
$$ENVIRONMENT$$

SITE 19
SBO–P

NAD 83

CLASS 'I' RIPRAP
SEE DETAIL AC

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL AC

EST. 99 TONS
EST. 189 SYGF

PLUG & FILL w/ FLOWABLE FILL

TRENCHLESS INSTALLATION 66" WELDED STEEL

REMOVE

30" RCP–IV

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

TB2GI
15" RCP–IV
TB2GI
15" RCP–IV
TB2GI
24" RCP–IV
TB2GI
24" RCP–IV
2GI–B SG
15" RCP–IV
2GI–B SG
2GI
15" RCP–IV

REMOVE

IMPACTS IN SURFACE WATER (60" WSP)

REMOVE

PLUG & FILL w/ FLOWABLE FILL

PLUG & FILL w/ FLOWABLE FILL

TEMP. IMPACTS IN SURFACE WATER

SITE 18 SBO–P

GRAPHIC SCALE 20' 0' 20' 40' 60'

I-26 EB 45.5' CONC

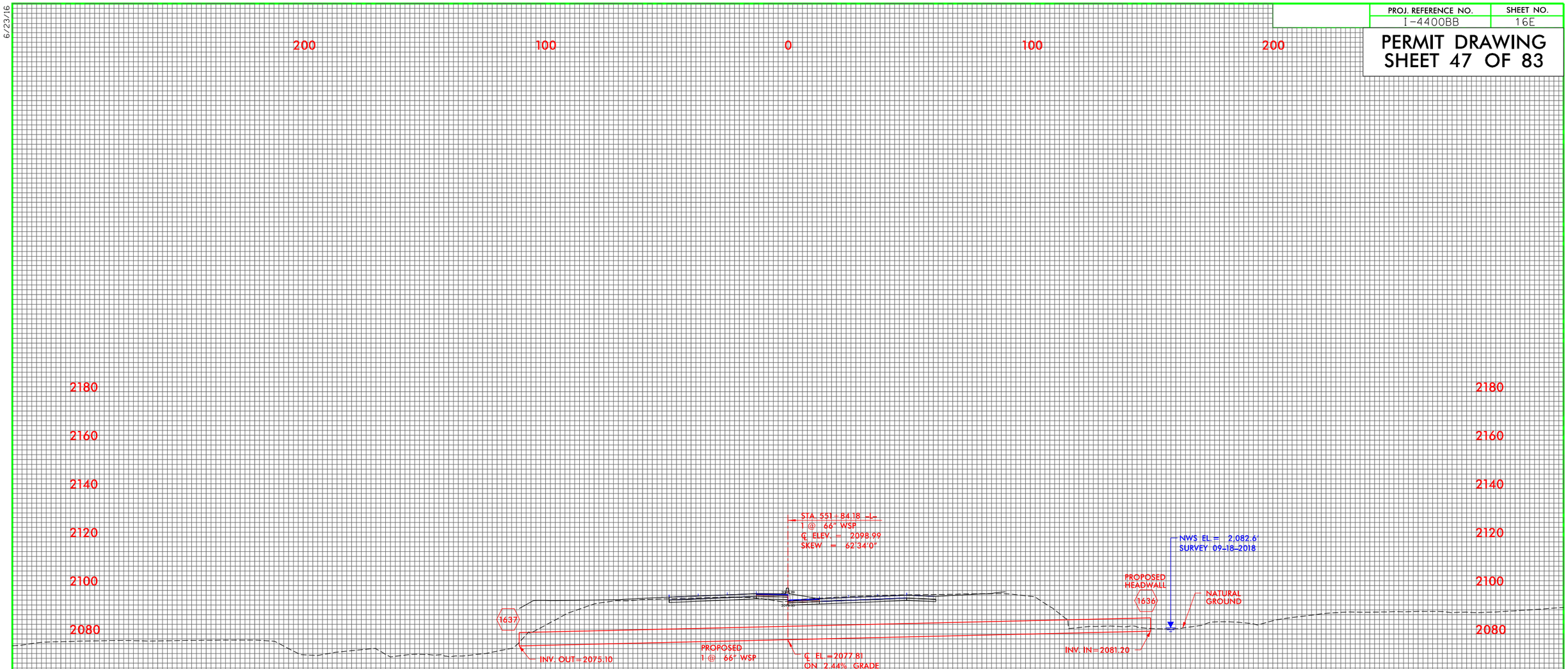
MARY N. CONTOMARINOS, ET AL
DB 1188 PG 476

DONS GOLF LEARNING CENTER, INC.
DB 1567 PG 714

6/23/16

PROJ. REFERENCE NO.	SHEET NO.
I-4400BB	16E

PERMIT DRAWING
SHEET 47 OF 83



PROFILE

BUNCOMBE & HENDERSON COUNTY
PROJECT: I-4400C
I-26
I-26 BETWEEN US 64 (CHIMNEY ROCK ROAD)
TO WEST OF NAPLES ROAD (SR1534)

$$$$SYSTIME$$$$
$$$$USERNAME$$$$
$$$$DATE$$$$
$$$$FILENAME$$$$

WETLAND & STREAM IMPACTS

DENOTES IMPACTS IN SURFACE WATER

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

PERMIT DRAWING
SHEET 48 OF 83

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

NAD 83

SBN-1

SITE 20

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (OUTLET PROTECTION) SEE DETAIL AD

CLEMENT PAPPAS NC, INC.
DB 1067 PG 68

CLASS 'B' RIPRAP
EST. 5 TONS
EST. 7 SYCF

CLASS 'I' RIPRAP
SEE DETAIL AD

CLASS I RIPRAP
EST. 15 TONS
EST. 30 SYCF

PLUG & FILL w/ FLOWABLE FILL

STANDARD 'V' DITCH
SEE DETAIL AE
EST. 34 CY DDE

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

PD8

ADJUST DI

REMOVE

PLUG & FILL w/ FLOWABLE FILL

2GI-A SG

2GI-B SG

2GI

TB2GI

I-26 EB 38' CONC

I-26 WB 38.5' CONC

SINGLE SLOPE CONC. BARRIER

12" CMP

15" RCP-IV

18" RCP-IV

24" RCP-IV

30" RCP-IV

36" RCP-IV

15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

TRENCH GRATES WELDED STEEL INSTALLATION

4OTCB

PLUG & FILL w/ FLOWABLE FILL

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

TOE PROTECTION
SEE DETAIL P

BM #25

DON FABANS
DB 1360 PG 671

DANNY R. JENKINS
DB 1128 PG 743

CHON HEE PARK
DB 819 PG 687

LARRY G. HAYES
DB 774 PG 301

CHARLES R. TAYLOR
DB 884 PG 535

LISA V. BRISINI
DB 1579 PG 535

WESLEY A. HALBA
DB 1386 PG 9

SHERMAN DR

MATCHLINE SHEET 16
-L- STA 553+00.00

MATCHLINE SHEET 18
-L- STA 567+00.00

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

FOR -L- PROFILE, SEE SHEET 61 & 62

$$$$$$$SYSTIME$$$$$
$$$$$$$

WETLAND & STREAM IMPACTS

DENOTES IMPACTS IN SURFACE WATER

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-4400BB	17
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

PERMIT DRAWING
SHEET 49 OF 83

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

NAD 83

SBN-1

SBN-1

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (OUTLET PROTECTION) SEE DETAIL AD

SITE 20

CLEMENT PAPPAS NC, INC.
DB 1067 PG 68

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

CLASS 'I' RIPRAP
SEE DETAIL AD

CLASS I RIPRAP
EST. 15 TONS
EST. 30 SYGF

PLUG & FILL w/ FLOWABLE FILL

STANDARD 'V' DITCH
SEE DETAIL AE
EST. 34 CY DDE

PD8

MATCHLINE SHEET 16
-L- STA 553+00.00

MATCHLINE SHEET 18
-L- STA 567+00.00

SINGLE SLOPE CONC. BARRIER

I-26 EB 38' CONC

I-26 WB 38.5' CONC

DON FABANS
DB 1360 PG 671

DANNY R. JENKINS
DB 1128 PG 743

CHON HEE PARK
DB 819 PG 687

LARRY G. HAYES
DB 774 PG 301

CHARLES R. TAYLOR
DB 884 PG 535

LISA V. BRISINI
DB 1579 PG 535

WESLEY A. HALBA
DB 1386 PG 9

FOR -L- PROFILE, SEE SHEET 61 & 62

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

$$$$$$CYCTIME$$$$$$
$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$
$$$$USERNAME$$$$
$$SCALE$$
$$ENVIRONMENT$$

SITE 20 SBN–I

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-4400BB	I7C
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 50 OF 83

NAD 83

CLEMENT PAPPAS NC, INC.
DB 1067 PG 68

TEMP. IMPACTS IN SURFACE WATER

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

CLASS 'I' RIPRAP
SEE DETAIL AD

IMPACTS IN SURFACE WATER (OUTLET PROTECTION) SEE DETAIL AD

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

15" RCP-IV
REMOVE AND REPLACE

ADJUST DI

36" RCP-IV

REMOVE

2GI–A SG

18" RCP-IV

2GI–B SG

PLUG & FILL w/ FLOWABLE FILL

30" RCP–IV

24" RCP–IV

4OTCB

15" CSP W/ELBOWS AND ROD AND LUG CONNECTORS

TB2GI

15" RCP–IV

FOR –L– PROFILE, SEE SHEET 61 & 62

GRAPHIC SCALE 30' 0' 30' 60' 90'

REVISIONS

$$$$$$SYSTIME$$$$$
$$$$$$

SITE 20 SBN–1

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-4400BB	I7D
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 51 OF 83

NAD 83

CLEMENT PAPPAS NC, INC.
DB 1067 PG 68

TEMP. IMPACTS IN SURFACE WATER

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

CLASS 'I' RIPRAP
SEE DETAIL AD

IMPACTS IN SURFACE WATER (OUTLET PROTECTION) SEE DETAIL AD

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

15" RCP-IV
REMOVE AND REPLACE

ADJUST DI

36" RCP-IV
REMOVE

2GI-A SG

18" RCP-IV
REMOVE

REMOVE
PLUG & FILL w/ FLOWABLE FILL

2GI-B SG

30" RCP-IV
REMOVE

TB2GI

15" RCP-IV

18" RCP-IV

24" RCP-IV

4OTCB

15" CSP
W/ ELBOWS AND ROD AND LUG CONNECTORS

I-26 EB 38" CONC

I-26 WB 38.5" CONC

30' 0' 30' 60' 90'
GRAPHIC SCALE

FOR –L– PROFILE, SEE SHEET 61 & 62

REVISIONS

$$$$$$SYSTIME$$$$$
$$$$$$

WETLAND & STREAM IMPACTS

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-4400BB	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 52 OF 83

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

DENOTES FILL IN WETLANDS

DENOTES MECHANIZED CLEARING IN WETLANDS

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL AC

CLEMENT PAPPAS NC, INC. DB 1067 PG 68

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

SBI–P

SITE 21

CLASS 'I' RIPRAP SEE DETAIL AC

TEMP. IMPACTS IN SURFACE WATER

MECHANIZED CLEARING IN WETLAND

FILL IN WETLANDS

WAT

IMPACTS IN SURFACE WATER (66" WSP)

YAMONT FARMS, LLC DB 1537 PG 47

WAU

NAD 83

PROP. SHOULDER BERM GUTTER

PLUG & FILL w/ FLOWABLE FILL

PDE

POC

SEE ROCK EMBANKMENT DETAIL ON SHEET 2G–1

15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

FERNCLIFF ESTATES SUBDIVISION

MATCHLINE SHEET 17 –L– STA 567+00.00

MATCHLINE SHEET 19 –L– STA 581+00.00

SINGLE SLOPE CONC. BARRIER

TRENCHLESS INSTALLATION 66" WELDED STEEL

REMOVE

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

TOE PROTECTION SEE DETAIL P

SBS–I

SITE 22

SITE 41

SBI–R

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL AH

JAMES McKINNEY DB 1623 PG 278

CHANNEL CHANGE SEE DETAIL U CLASS I RIPRAP EST. 193 TONS EST. 337 SYGF

TEMP. IMPACTS IN SURFACE WATER

JOSHUA S. McGEE DB 1290 PG 537

COLLEEN BRIGGS DB 1442 PG 569

DONALD T. JONES DB 1288 PG 152

TIMOTHY J. CANNON DB 1597 PG 465

FS SEE DETAIL N

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

FOR –L– PROFILE, SEE SHEET 62 & 63

$$$$$$$$SYSTIME$$$$$
$$$$$$$$

WETLAND & STREAM IMPACTS

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-4400BB	18
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 53 OF 83

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

F F DENOTES FILL IN WETLANDS

DENOTES MECHANIZED CLEARING IN WETLANDS

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL AC

SBI–P

SITE 21

CLASS 'I' RIPRAP SEE DETAIL AC

TEMP. IMPACTS IN SURFACE WATER

MECHANIZED CLEARING IN WETLAND

FILL IN WETLANDS

WAT

IMPACTS IN SURFACE WATER (66" WSP)

WAU

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

PROP. SHOULDER BERM GUTTER

PLUG & FILL w/ FLOWABLE FILL

SEE ROCK EMBANKMENT DETAIL ON SHEET 2G-1

15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

TRENCHLESS INSTALLATION 66" WELDED STEEL

REMOVE

TOE PROTECTION SEE DETAIL P

SBS–I

SITE 22

SITE 41

SBI–P

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

CHANNEL CHANGE SEE DETAIL U CLASS I RIPRAP EST. 193 TONS EST. 337 SYGF

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL AH

FS SEE DETAIL N

NAD 83

MATCHLINE SHEET 17 –L– STA 567+00.00

MATCHLINE SHEET 19 –L– STA 581+00.00

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

FOR –L– PROFILE, SEE SHEET 62 & 63

$$$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$
$$$$$USERNAME$$$$
$$SCALE$$
$$ENVIRONMENT$$

SITE 21 | SBI–P | WAT

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Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	18C
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 54 OF 83

REVISIONS

$$$$$$SYSTIME$$$$$
$$$$$$

SITE 21 | SBI–P | WAT

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-4400BB	18D
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 55 OF 83

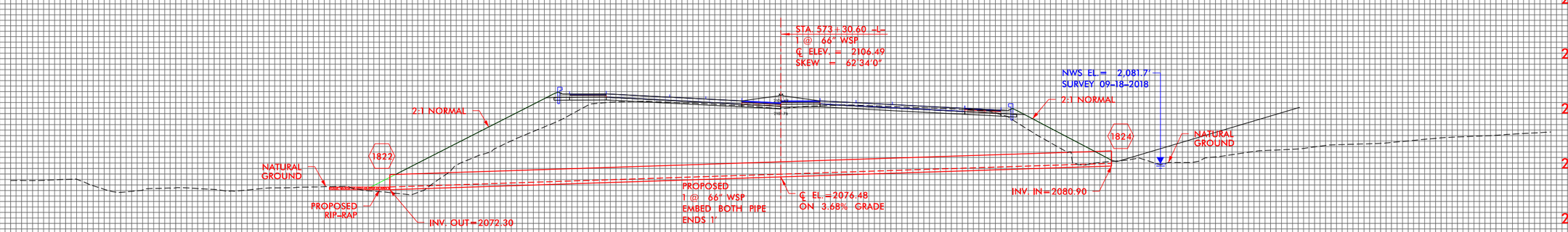
REVISIONS

$$$$$$SYSTIME$$$$$
$$$$$$

6/23/16

PROJ. REFERENCE NO.	SHEET NO.
I-4400BB	18E

PERMIT DRAWING
SHEET 56 OF 83



PROFILE

BUNCOMBE & HENDERSON COUNTY
PROJECT: I-4400C
I-26
I-26 BETWEEN US 64 (CHIMNEY ROCK ROAD)
TO WEST OF NAPLES ROAD (SR1534)

$$$$SYSTIME$$$$
$$$$DATE$$$$
$$$$USER$$$$
$$$$FILENAME$$$$
$$$$DGNFILE$$$$

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	I-4400BB	X-177

PERMIT DRAWING
SHEET 57 OF 83

MECHANIZED CLEARING IN WETLANDS
EXCAVATION IN WETLANDS
FILL IN WETLANDS

W.B.
C.L. ROW
W.L.B.
1.75:1
2107.09
0.010
0.050
2106.19
0.050
0.050
0.050
2104.34
2105.00
0.010
0.050
0.050
2103.93
0.050
0.050
2102.04
2102.16
2:1

573+00.00

2107.90
0.010
0.050
2106.90
0.050
0.050
0.050
2105.05
2105.63
0.010
0.050
0.050
2104.56
0.050
0.050
2102.66
2102.60
1.75:1
2:1
EX. ROW

572+50.00

–L– (I–26)

WETLAND & STREAM IMPACTS

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-4400BB	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 58 OF 83

NAD 83

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (DOUBLE 10'X8' CULVERT)

SBV–P

SITE 24

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AM

SBU–P

SBT–I

SITE 26

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL 3

PIPE NOT BURIED

SITE 23

IMPACTS IN SURFACE WATER (DOUBLE 10'X8' CULVERT)

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AN

SBU–P

(121) LAYMAN FOUNDATION OF NC, INC. DB 246 PG 588

FS SEE DETAIL O

TOE PROTECTION SEE DETAIL P

PLUG & FILL w/ FLOWABLE FILL

CHANNEL CHANGE SEE DETAIL U CLASS I RIPRAP EST. 163 TONS EST. 285 SYGF

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

REMOVE

24" CSP W/ ELBOWS AND ROD AND LITE CONNECTORS

CLASS II RIP-RAP ON 1' RISERS EMBEDDED IN CHANNEL SEE DETAIL 2

PLACE RIP-RAP AT ENDWALL SEE DETAIL 3

FS SEE DETAIL N

C BM #27 ELEV.=2088' BL STA. 265+98.00 85' RT SPIKE NAIL IN BASE OF 24" POPLAR

MATCHLINE SHEET 18 –L– STA 581+00.00

MATCHLINE SHEET 20 –L– STA 595+00.00

N 04°22'42" E 594.41'

RUINS

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

FOR –L– PROFILE, SEE SHEET 63 & 64

REVISIONS

$$$$$$$$SYSTIME$$$$$
$$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$
$$$$$USERNAME$$$$
$$SCALE$$
$$ENVIRONMENT$$

WETLAND & STREAM IMPACTS

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-4400BB	19
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 59 OF 83

NAD 83

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (DOUBLE 10'X8' CULVERT)

SBV–P

SITE 24

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AM

SBU–P

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AM

SBT–I

SITE 26

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL 3

PIPE NOT BURIED

SITE 23

IMPACTS IN SURFACE WATER (DOUBLE 10'X8' CULVERT)

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AN

SBU–P

LAYMAN FOUNDATION OF NC, INC. DB 246 PG 588

MATCHLINE SHEET 18 –L– STA 581+00.00

MATCHLINE SHEET 20 –L– STA 595+00.00

FOR –L– PROFILE, SEE SHEET 63 & 64

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

REVISIONS

$$$$$$$SYSTIME$$$$$$
$$$$$$$

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

NAD 83

585

590

IMPACTS IN SURFACE WATER (DOUBLE 10'X8' CULVERT)

SBV–P

TEMP. IMPACTS IN SURFACE WATER

SITE 24

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AM

SBU–P

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AM

SBT–I

SITE 26

TEMP. IMPACTS IN SURFACE WATER

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL 3

PIPE NOT BURIED

(121) LAYMAN FOUNDATION OF NC, INC. DB 246 PG 588

+90.00 –L–
133.52' LT
145.00' LT

PLUG & FILL w/ FLOWABLE FILL

CHANNEL CHANGE SEE DETAIL U
CLASS I RIPRAP
EST. 163 TONS
EST. 285 SYGF

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

CLASS II RIP-RAP ON BANKS EMBEDDED IN CHANNEL SEE DETAIL 2

PLACE RIP-RAP AT EMBANKMENT SEE DETAIL 3

REMOVE

24" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

48" WW & ISBW

R/W MON

MTL

CONC

1901 1902 1903 1904 1905 1909 1910 1911 1912 1913 1914 1916 1917 1918 1920 1921 1922 1923 1926 1927 1933 1934 1935

TB2GI

TB2GI–A

TB2GI–B

2GI–A FG

2GI–B FG

24" RCP–IV
18" RCP–IV
15" RCP–IV
36" RCP–IV
30" RCP–IV

24" CMP

REMOVE

RETAIN

FS SEE DETAIL N

BM #27 ELEV.=2088.71
-BL- STA. 265+98.00 85' RT
SPIKE NAIL IN BASE OF 24" POPLAR

SITE 23

SBU–P

IMPACTS IN SURFACE WATER (DOUBLE 10'X8' CULVERT)

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AN

(121) LAYMAN FOUNDATION OF NC, INC. DB 246 PG 588

30' 0' 30' 60' 90'
GRAPHIC SCALE

FOR –L– PROFILE, SEE SHEET 63 & 64

REVISIONS

$$$$$$$SYSTIME$$$$
$$$$$$$

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES 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-4400BB	19D
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 61 OF 83

NAD 83

IMPACTS IN SURFACE WATER (DOUBLE 10'X8' CULVERT)

SBV–P

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AM

SBU–P

SITE 24

SBT–I

SITE 26

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AM

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL 3

PIPE NOT BURIED

LAYMAN FOUNDATION OF NC, INC.
DB 246 PG 588

+90.00 –L–
133.52' LT
145.00' LT

PLUG & FILL w/ FLOWABLE FILL

CHANNEL CHANGE SEE DETAIL U
CLASS I RIPRAP
EST. 163 TONS
EST. 285 SYGF

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

CLASS II RIP-RAP ON BANKS EMBEDDED IN CHANNEL SEE DETAIL 2

PLACE RIP-RAP AT EMBANKMENT SEE DETAIL 3

REMOVE

24" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

END EXISTING ROADSIDE DITCH

24" RCP–IV

TB2GI

1933

1934

1901

1909

1910

2GI–B FG

1911

1912

1935

1927

1914

2GI–B FG 15" RCP–IV

1916

36" RCP–IV

1913

2GI–A FG

1926

TB2GI–B

1917

TB2GI–A

1920

15" RCP–IV

1922

30"

1918

1921

1923

1902

1903

1904

1905

15" RCP–IV

18" RCP–IV

2GI–B SG

FS SEE DETAIL N

48" WW & ISBW

R/W MON

C BM #27 ELEV.=2088.51'
-BL- STA. 265+98.00 85'RT
SPIKE NAIL IN BASE OF 24" POPLAR

SITE 23

IMPACTS IN SURFACE WATER (DOUBLE 10'X8' CULVERT)

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AN

30' 0' 30' 60' 90'
GRAPHIC SCALE

FOR –L– PROFILE, SEE SHEET 63 & 64

REVISIONS

$$$$SYSTIME$$$$
$$$$USERNAME$$$$
$$SCALE$$
$$ENVIRONMENT$$

6/23/16

PROJ. REFERENCE NO.	SHEET NO.
I-4400BB	19E

PERMIT DRAWING
SHEET 62 OF 83

200 100 0 100 200

-150 -100 -50 ℄ 50 100 150

2100 2100

STA. 588+18.3 -L-
2 @ 8' X 8' RCBC
℄ ELEV. = 2083.13'
SKEW = 90°5'

2090 2090' 2090

PROPOSED GROUND

EXISTING GROUND

2080 2080' 2080

Q_{100} EL. = 2078.4'

Q_{50} EL. = 2076.8'

EXISTING STREAM BED

WS EL. @ SURVEY = 2067.6'
9/14/18

NATURAL GROUND RIGHT BANK

EXISTING STREAM BED

2070 2070' 2070

INV. = 2063.48'

INV. = 2063.67'

INV. = 2067.50'

INV. = 2067.11'

NATURAL GROUND LEFT BANK

℄ EL. = 2065.5'
ON 2.26% GRADE

NATURAL GROUND RIGHT BANK

NATURAL GROUND LEFT BANK

2060 2060' 200 100 0 100 200 2060

EXTEND EXISTING 2 @ 8'x8' RCBC
9.3' DOWNSTREAM AND 16.1' UPSTREAM

RETAIN EXISTING 2@8'X8' RCBC

BUNCOMBE & HENDERSON COUNTY
PROJECT: I-4400C
I-26
I-26 BETWEEN US 25 (ASHEVILLE HIGHWAY)
TO SOUTH OF NC 280

$$$$$SYSTIME$$$$$
$$$$$SJOB$$$$$
$$$$$SENAME$$$$$
$$$$$SELEV$$$$$

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-4400BB	21
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 63 OF 83

REVISIONS

WETLAND & STREAM IMPACTS

NAD 83

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

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL 21-7

TEMP. IMPACTS IN SURFACE WATER

SCB-P
SITE 27

REALIGN CHANNEL AT OUTLET
SEE DETAIL 21-7
EST 160 TONS CL I RR
EST 120 SY GT
RIP RAP EMBEDDED IN CHANNEL

PIPE BURIED 1.0'

CANTERBURY WAY

SUSAN L. LONDON
DB 2012E PG 1

MATCHLINE SHEET 20
-L- STA 609+00.00

MATCHLINE SHEET 22
-L- STA 623+00.00

PSH
REMOVE
18" CSP W\ELBOWS AND LUG AND ROD CONNECTORS
HW
CL B RIP RAP EST 1 TON EST 5 SY GT
15" CSP W\ ELBOWS AND LUG AND ROD CONNECTORS
SPECIAL CUT DITCH SEE DETAIL 21-1
CLASS I RIP-RAP EST. 11 TONS EST. 22 SY GT
SPECIAL CUT DITCH SEE DETAIL 21-2
CL B RIP RAP EST 2 TONS EST 7 SY GT
FS SEE DETAIL 21-5
2GI-B FG
2GI-B SG
PLUG & FILL w/ FLOWABLE FILL
TRENCHLESS INSTALLATION 36" WELDED STEEL
DBL. FACED SINGLE SLOPED CONC. BARRIER
REMOVE DI AND 10' OF 18" CMP
FILL W/FLOWABLE FILL
TB2GI
TB2GI-A
CAT-1
GPS-26
REMOVE
RETAIN
FS SEE DETAIL 21-6
REALIGN CHANNEL AT INLET SEE DETAIL 21-8 EST 50 TONS CL I RR EST 100 SY GT
CL 'B' RIP RAP EST 2 TONS EST 7 SY GT
SPECIAL CUT DITCH SEE DETAIL 21-4
RIP RAP AT EMBANKMENT SEE DETAIL 21-3

FLETCHER HOSPITAL, INC.
DB 668 PG 457

ADVENTIST HEALTH SYSTEM/ SUNBELT HEALTH CARE CORP.
DB 692 PG 805
AREA U/C

PIPE BURIED 1.0'

SITE 28
SCB-P

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL 21-8

NAPLES RD.

(121)
LAYMAN FOUNDATION OF NC, INC.
DB 246 PG 588

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

FOR -L- PROFILE, SEE SHEET 65 & 66

8/5/2019
...\I4400BB_HYD_PRM_PSH_21_ NO CONT.dgn
$$$$USERNAME$$$$
$$$$DATE$$$$
$$$$TIME$$$$
$$$$ENVIRONMENT$$$$

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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-4400BB	21
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 64 OF 83

REVISIONS

WETLAND & STREAM IMPACTS

NAD 83

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

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL 21-7

TEMP. IMPACTS IN SURFACE WATER

SCB-P
SITE 27

REALIGN CHANNEL AT OUTLET SEE DETAIL 21-7 EST 160 TONS CL I RR EST 120 SY GT RIP RAP EMBEDDED IN CHANNEL

PIPE BURIED 1.0'

CANTERBURY WAY

SUSAN L. LONDON DB 2012E PG 01

PSH
REMOVE
18" CSP W/ELBOWS AND LUG AND ROD CONNECTORS
2GI-B FG
18" RCP-IV
PLUG & FILL w/ FLOWABLE FILL
TRENCHLESS INSTALLATION 85" WELDED STEEL
15" RCP-IV
TB2GI
DBL. FACED SINGLE SLOPED CONC. BARRIER
15" CMP
CAT-1
CL 'B' RIP RAP EST 2 TONS EST 7 SY GT
REALIGN CHANNEL AT INLET SEE DETAIL 21-8 EST 50 TONS CL I RR EST 100 SY GT
RIP RAP AT EMBANKMENT SEE DETAIL 21-3
SPECIAL CUT DITCH SEE DETAIL 21-4
CL B RIP RAP EST 1 TON EST 5 SY GT
15" CSP W/ ELBOWS AND LUG AND ROD CONNECTORS
SPECIAL CUT DITCH SEE DETAIL 21-1
CLASS I RIP-RAP EST. 11 TONS EST. 22 SY GT
SPECIAL CUT DITCH SEE DETAIL 21-2
CL B RIP RAP EST 2 TONS EST 7 SY GT
36" RCP-IV
30" CMP
24" RCP-IV
24" CMP
TB2GI-A
FS SEE DETAIL 21-6
2GI-B SG
FS SEE DETAIL 21-5
18" CMP W/FLOWABLE FILL
18" RCP-IV
18" WMH
RETAIN
REMOVE DI AND 10' OF 18" CMP
GPS-26
NAPLES RD.
LAYMAN FOUNDATION OF NC INC. DB 246 PG 588
FLETCHER HOSPITAL, INC. DB 668 PG 457
ADVENTIST HEALTH SYSTEM/ SUNBELT HEALTH CARE CORP. DB 692 PG 805
AREA U/C
48" WW & ISBW
I-26 WB CONC
I-26 WB 39" CONC
MTL
DK. FR. CONC
EXISTING R/W

SITE 28
SCB-P
TEMP. IMPACTS IN SURFACE WATER
IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL 21-8
PIPE BURIED 1.0'

MATCHLINE SHEET 20 -L- STA 609+00.00

MATCHLINE SHEET 22 -L- STA 623+00.00

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

FOR -L- PROFILE, SEE SHEET 65 & 66

8/5/2019
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5:39:10 PM
$$$$USERNAME$$$$
$$$$ENVIRONMENT$$$$

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PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	21
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 65 OF 83

REVISIONS

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL 21–7

TEMP. IMPACTS IN SURFACE WATER

SCB–P

SITE 27

LEGEND

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83

REALIGN CHANNEL AT OUTLET
SEE DETAIL 21–7
EST 160 TONS CL I RR
EST 120 SY GT
RIP RAP EMBEDDED IN CHANNEL

PIPE BURIED 1.0'

PSH

REMOVE

HW

18" CSP W\ ELBOWS AND LUG AND ROD CONNECTORS

2GI–B FG

15" CSP W\ ELBOWS AND LUG AND NUT CONNECTORS

PLUG & FILL w/ FLOWABLE FILL

TRENCHLESS INSTALLATION

66" WELDED STEEL

TB2G

TB2GI

REMOVE

TI

– L –

50" CMP

15" CMP

TB2GI

REMOVE

CAT–1

REALIGN CHANNEL AT INLET
SEE DETAIL 21–8
EST 50 TONS CI I RR
EST 100 SY GT

SPECIAL CUT D
SEE DETAIL 21–4

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL 21–8

PIPE BURIED 1.0'

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

SCB–P

SITE 28

FOR –L– PROFILE, SEE SHEET 65 & 66

8/5/2019
...\I4400BB_HYD_PRM_PSH_21_ENLARGE_NO CONT.dgn
$$USER$$
$$SCALE$$
$$ENVIRONMENT$$

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PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	21
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 66 OF 83

REVISIONS

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL 21–7

TEMP. IMPACTS IN SURFACE WATER

SCB–P

SITE 27

LEGEND

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83

REALIGN CHANNEL AT OUTLET
SEE DETAIL 21–7
EST 160 TONS CL I RR
EST 120 SY GT
RIP RAP EMBEDDED IN CHANNEL

PIPE BURIED 1.0′

PSH

REMOVE

HW

18″ CSP W\ ELBOWS AND LUG AND ROD CONNECTORS

2GI–B FG

15″ CSP W\ ELBOWS AND LUG AND NUT CONNECTORS

PLUG & FILL w/ FLOWABLE FILL

TRENCHLESS INSTALLATION 66″ WELDED STEEL

TB2G

TB2GI

– L –

REMOVE

TI

60″ CMP

15″ CMP

TB2GI

REMOVE

CAT–1

REALIGN CHANNEL AT INLET
SEE DETAIL 21–8
EST 50 TONS CL I RR
EST 100 SY GT

SPECIAL CUT D
SEE DETAIL 21–4

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL 21–8

PIPE BURIED 1.0′

50′ 0′ 50′ 100′ 150′
GRAPHIC SCALE

SCB–P

SITE 28

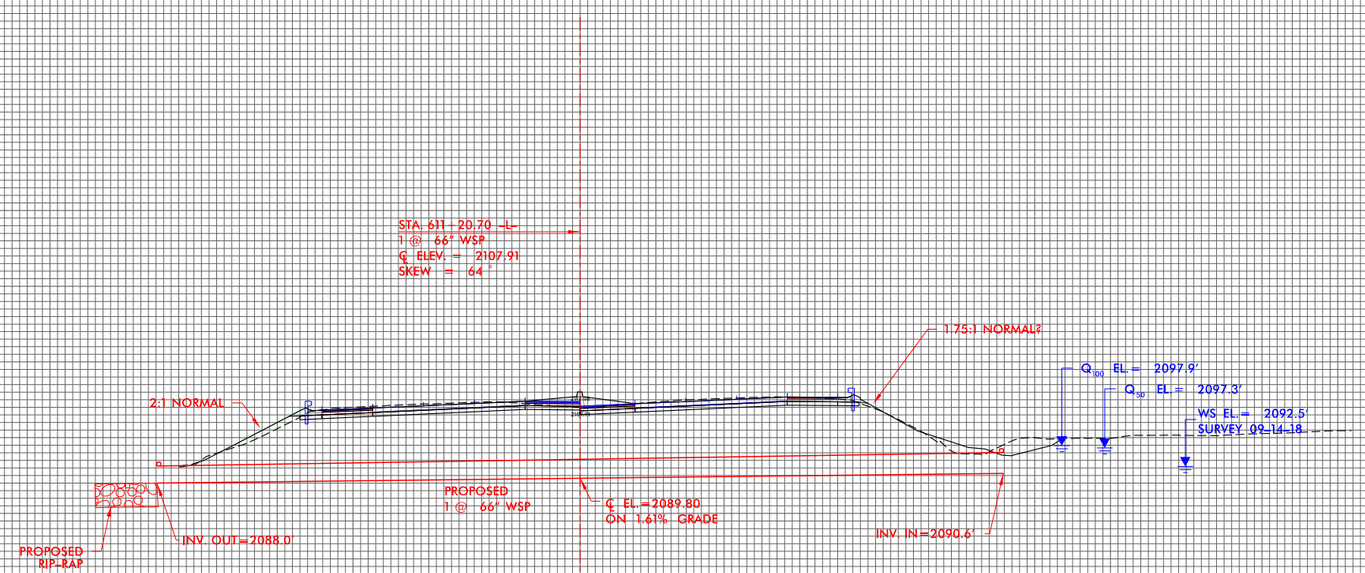
FOR –L– PROFILE, SEE SHEET 65 & 66

8/5/2019
::\I4400BB_HYD_PRM_PSH_21_ENLARGE.dgn
$$$$USERNAME$$$$
$$$$ENVIRONMENT$$$$

6/23/16

PROJ. REFERENCE NO.	SHEET NO.
I-4400BB	21E

PERMIT DRAWING
SHEET 67 OF 83



PROFILE

BUNCOMBE & HENDERSON COUNTY
PROJECT: I-4400C
I-26
I-26 BETWEEN US 64 (CHIMNEY ROCK ROAD)
TO WEST OF NAPLES ROAD (SR1534)

$$$$SYSTIME$$$$
$$$$DATE$$$$
$$$$USER$$$$
$$$$FILENAME$$$$

WETLAND & STREAM IMPACTS

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PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	22
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 68 OF 83

REVISIONS

LEGEND

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

NAD 83

JEANETTE GLENN
DB 1007 PG 659

LEI SHI
DB 1692 PG 251

MACK C. YOUNBLOOD, JR.
DB 789 PG 431
DB 551PG 425

PARSONS, TRUSTEE
DB 1448 PG 370

SITE 29
SCJ–I

SITE 31
SCA–P

SITE 32
SCA–P

SITE 33
SCA–P

SITE 34
SCD–P

SITE 35
SCG–P

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL 22–4

PIPE BURIED 0.6′

PIPE BURIED 0.8′

PIPE NOT BURIED

IMPACTS IN SURFACE WATER (BANK STABILIZATION)

IMPACTS IN SURFACE WATER (36″ RCP–III)

IMPACTS IN SURFACE WATER (24″ RCP–III & [illegible])

IMPACTS IN SURFACE WATER (30″ CSP & BANK STABILIZATION)

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL 22–6

TEMP. IMPACTS IN SURFACE WATER

PIPE NOT BURIED

PIPE BURIED 0.8′

MATCHLINE SHEET 21 –L– STA 623+00.00

MATCHLINE SHEET 23 –L– STA 637+00.00

MATCHLINE SHEET 23 –Y7– STA 20+25.00

FOR –L– PROFILE, SEE SHEET 66 & 67

50′ 0′ 50′ 100′ 150′
GRAPHIC SCALE

8/5/2019
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$$ENVIRONMENT$$

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PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	22
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 69 OF 83

REVISIONS

WETLAND & STREAM IMPACTS

LEGEND

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

NAD 83

JEANETTE GLENN DB 1007 PG 659

LEI SHI DB 1692 PG 251

MACK C. YOUNBLOOD, JR. DB 789 PG 431 DB 551PG 425

PARSONS, TRUSTEE DB 1448 PG 370

SITE 29 SCJ–I

SITE 31 SCA–P

SITE 32 SCA–P

SITE 33 SCA–P

SITE 34 SCD–P

SITE 35 SCG–P

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL 22–4

PIPE BURIED 0.6′

PIPE BURIED 0.8′

PIPE NOT BURIED

IMPACTS IN SURFACE WATER (BANK STABILIZATION)

IMPACTS IN SURFACE WATER (36″ RCP–III) 22

IMPACTS IN SURFACE WATER (24″ RCP–III & BANK STABILIZATION) 23

IMPACTS IN SURFACE WATER (30″ CSP & BANK STABILIZATION) 24

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL 22–6

TEMP. IMPACTS IN SURFACE WATER

MATCHLINE SHEET 21 –L– STA 623+00.00

MATCHLINE SHEET 23 –L– STA 637+00.00

MATCHLINE SHEET 23 –Y7– STA 20+25.00

FOR –L– PROFILE, SEE SHEET 66 & 67

GRAPHIC SCALE 50′ 0′ 50′ 100′ 150′

8/5/2019
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$$ENVIRONMENT$$

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PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	22
RW SHEET NO.	

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 70 OF 83

REVISIONS

LEGEND

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES IMPACTS IN SURFACE WATER

SITE 29

SCJ–I

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL 22–4

PIPE BURIED 0.6′

REALIGN CHANNEL AT OUTLET SEE DETAIL 22–4

NO RIP RAP IN JS

TOE PROTECTION SEE DETAIL 22–5

CL I RIP RAP
EST RR 2 TONS
EST GT 6 SY

CL I RIP RAP
EST RR 3 TONS
EST GT 7 SY

15″ CSP w/ ELBOWS AND ROD AND LUG CONNECTORS

15″ CSP w/ ELBOWS AND ROD AND LUG CONNECTORS

FS SEE DETAIL 22–X

2GI–B FG

15″ CSP w/ ELBOWS AND ROD AND LUG CONNECTORS

15″

2GI–B FG

2GI–B FG

FLOWABLE FILL

15″ CMP

30″ CMP

FLOWABLE FILL

TB2GI–A

15″ RCP–IV

REMOVE

TB2GI–A

30″ CMP

FLOWABLE FILL

TRENCHLESS INSTALLATION 36″ WELDED STEEL

HW

REALIGN CHANNEL AT INLET SEE DETAIL 22–6

NAD 83

50′ 0′ 50′ 100′ 150′
GRAPHIC SCALE

FOR –L– PROFILE, SEE SHEET 63 & 64

8/5/2019
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$$USER$$
$$SCALE$$
$$ENVIRONMENT$$

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PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	22
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 71 OF 83

REVISIONS

LEGEND

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES IMPACTS IN SURFACE WATER

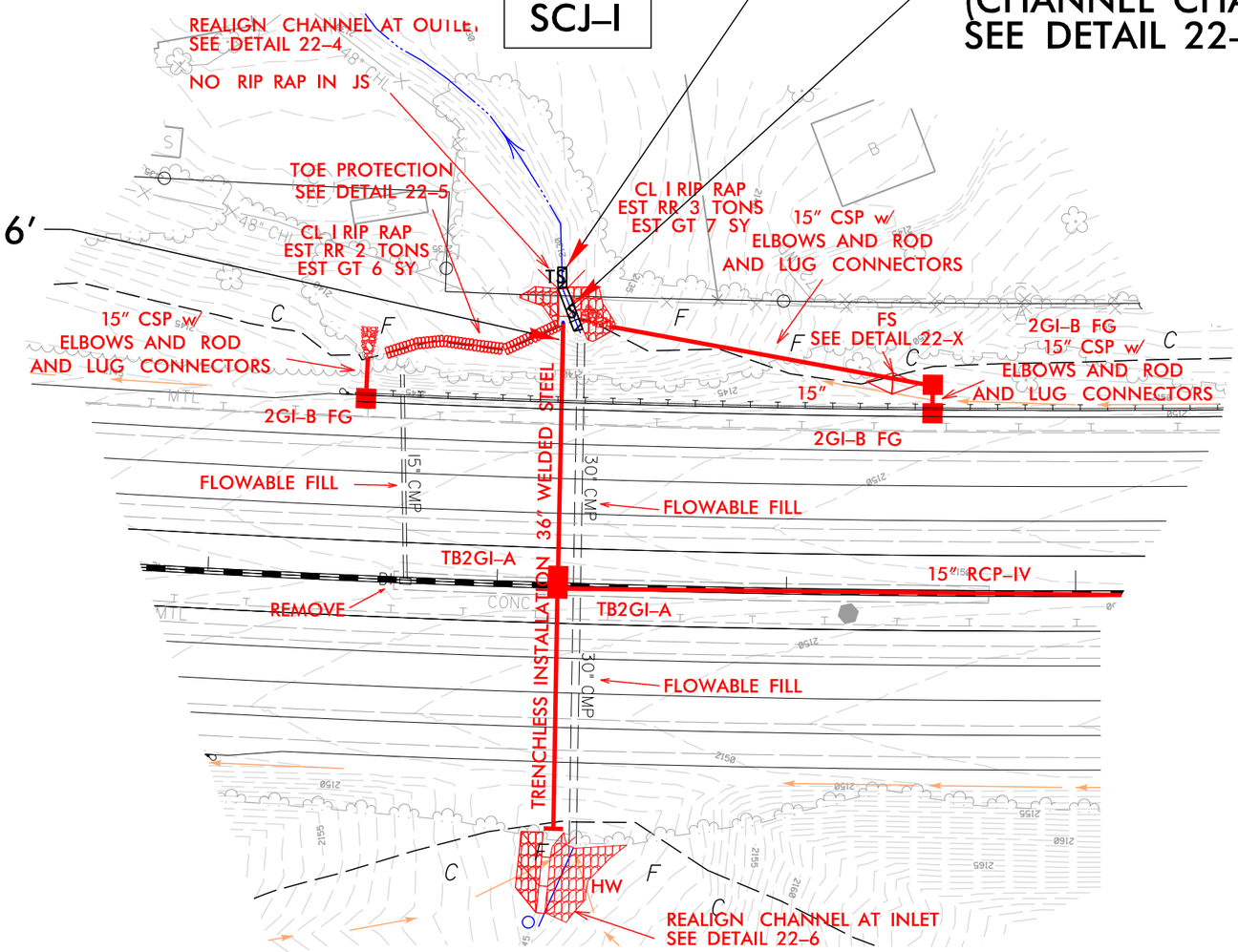
SITE 29

SCJ–I

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL 22–4

PIPE BURIED 0.6′



50′ 0′ 50′ 100′ 150′

GRAPHIC SCALE

FOR –L– PROFILE, SEE SHEET 63 & 64

8/5/2019
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$$SCALE$$
$$ENVIRONMENT$$

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PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	22
RW SHEET NO.	

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 72 OF 83

REVISIONS

SITE 31 | SCA–P

TEMP. IMPACTS IN SURFACE WATER

PIPE BURIED 0.8′

CL I RIP RAP BANKS ONLY EST 26 TONS EST 50 SY GT

NO RIP RAP IN JS

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL 22–4

INV=2132.44′

TRENCHLESS INSTALLATION 48″ WELDED STEEL

FILL W\ FLOWABLE FILL

LEGEND

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S DENOTES IMPACTS IN SURFACE WATER

NAD 83

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL 22–6

PIPE BURIED 0.8′

IMPACTS IN SURFACE WATER (24″ RCP–III & BANK STABILIZATION)

PIPE NOT BURIED

TEMP. IMPACTS IN SURFACE WATER

PIPE NOT BURIED

SITE 34 | SCD–P

IMPACTS IN SURFACE WATER (36″ RCP–III)

INV=2140.81′

HW

CL I RIP RAP EST RR 26 TONS EST GT 50 SY

REMOVE

REALIGN CHANNEL AT INLET SEE DETAIL 22–6

NO RIP RAP IN JS

48″ WW & ISBW

SITE 32 | SCA–P

SCA–P

SITE 33

CLASS I RIP RAP BANKS ONLY EST 13 TONS

INV=2149.74′

36″ RCP–III

BLIND JB

CLASS I RIP RAP BANKS ONLY EST 7 TONS

24″ RCP–III

CLASS I RIP RAP BANKS ONLY EST 7 TONS

30″ CSP W\ELBOWS AND ROD AND LUG CONNECTORS

18″ RCP–IV

FS

DETAIL 22–3

BLIND JB

2GI–A SG

15″ RCP–IV

SITE 35 | SCG–P

IMPACTS IN SURFACE WATER (30″ CSP & BANK STABILIZATION)

50′ 0′ 50′ 100′ 150′

GRAPHIC SCALE

FOR –L– PROFILE, SEE SHEET 63 & 64

8/5/2019
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$$ENVIRONMENT$$

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PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	22
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 73 OF 83

REVISIONS

SITE 31 | SCA–P

TEMP. IMPACTS IN SURFACE WATER

PIPE BURIED 0.8′

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL 22–4

CL I RIP RAP BANKS ONLY EST 26 TONS EST 50 SY GT

NO RIP RAP IN JS

TRENCHLESS INSTALLATION 48" WELDED STEEL

FILL W\ FLOWABLE FILL

INV=2132.44′

LEGEND

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

S S — DENOTES IMPACTS IN SURFACE WATER

NAD 83

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL 22–6

PIPE BURIED 0.8′

IMPACTS IN SURFACE WATER (24" RCP–III & BANK STABILIZATION)

PIPE NOT BURIED

TEMP. IMPACTS IN SURFACE WATER

PIPE NOT BURIED

SITE 34 | SCD–P

IMPACTS IN SURFACE WATER (36" RCP–III)

INV=2140.87′

HW

CL I RIP RAP EST RR 26 TONS EST GT 50 SY

REMOVE

REALIGN CHANNEL AT INLET SEE DETAIL 22–6

NO RIP RAP IN JS

SITE 32 | SCA–P

SITE 33

SCA–P

CLASS I RIP RAP BANKS ONLY EST 13 TONS

CLASS I RIP RAP BANKS ONLY EST 7 TONS

CLASS I RIP RAP BANKS ONLY EST 7 TONS

INV=2149.74′

36" RCP–III

RCP–III

BLIND JB

BLIND JB

TEMP. IMPACTS IN SURFACE WATER

PIPE NOT BURIED

SITE 35 | SCG–P

IMPACTS IN SURFACE WATER (30" CSP & BANK STABILIZATION)

30" CSP W\ELBOWS AND ROD AND LUG CONNECTORS

18" RCP–IV

FS

DETAIL 22–3

2GI–A SG

48" WW & ISBW

50′ 0′ 50′ 100′ 150′
GRAPHIC SCALE

FOR –L– PROFILE, SHEET 63 & 64

8/5/2019
...\I4400BB_HYD_PRM_PSH_22_SITE 31-35_ENL.dgn
$$USER$$
$$SCALE$$
$$ENVIRONMENT$$

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PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	23
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 74 OF 83

REVISIONS

MATCHLINE SHEET 24 –Y7– STA 11+70.00

MATCHLINE SHEET 22 –L– STA 637+00.00

MATCHLINE SHEET 22 –Y7– STA 20+25.00

MATCHLINE I-4400C –L– STA 650+50.00

N 73° 30' 20.0" E

S 44° 34' 44.8" E

N 67° 04' 48.8" W

TEMP. IMPACTS IN SURFACE WATER
SITE 37
SCM–I

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL 23–4

PIPE NOT BURIED

PIPE BURIED 0.7'
SITE 36
SCH–I

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL 23–5

TEMP. IMPACTS IN SURFACE WATER

ASHEVILLE SOUTH SE STORAGE VI, LLC DB 3156 PG 457

MOUNTAIN INN & SUITES-AIRPORT, LLC DB 1451 PG 552

SCOTT M. JARVIS DB 1640 PG 309 DB 1282 PG 470 DB 1108 PG 601 DB 1096 PG 566 DB 806 PG 51

NELSON MORALES DB 1457 PG 648

DANNY C. HOUSE DB 946 PG 270

GEORGE M. JARVIS DB 628 PG 333

PHYLIS A. WILSON DB 1391 PG 351

JEFFREY HUTCHINSON DB 1646 PG 487

ERNEST WRIGHT DB 1526 PG 422

TWIN SF DB

DBL. FACED SINGLE SLOPED CONC. BARRIER

TRENCHLESS INSTALLATION 42" WELDED STEEL

NCGS "NAPLES"

BM #55

BM #2 (I-4400C)

NAD 83

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

FOR –L– PROFILE, SEE SHEET 67 & 68
FOR –Y7– PROFILE, SEE SHEET 89

8/5/2019
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$$SCALE$$
$$ENVIRONMENT$$

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PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	23
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
DO NOT USE FOR R/W ACQUISITION

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 75 OF 83

REVISIONS

WETLAND & STREAM IMPACTS

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

MATCHLINE SHEET 24 –Y7– STA 11+70.00

MATCHLINE SHEET 22 –L– STA 637+00.00

MATCHLINE SHEET 22 –Y7– STA 20+25.00

MATCHLINE I-4400C –L– STA 650+50.00

NAD 83

TEMP. IMPACTS IN SURFACE WATER
SITE 37
SCM–I

PIPE NOT BURIED

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL 23–4

PIPE BURIED 0.7'
SITE 36
SCH–I

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL 23–5

TEMP. IMPACTS IN SURFACE WATER

–L–
EB

ASHEVILLE SOUTH SE STORAGE VI, LLC DB 3156 PG 457

MOUNTAIN INN & SUITES-AIRPORT, LLC DB 1451 PG 552

SCOTT M. JARVIS DB 1640 PG 309 DB 1282 PG 470 DB 1108 PG 601 DB 1096 PG 566 DB 806 PG 51

ERNEST WRIGHT DB 1526 PG 422

JEFFREY HUTCHINSON DB 1646 PG 487

GEORGE M. JARVIS DB 628 PG 333

PHYLIS A. WILSON DB 1391 PG 351

DANNY C. HOUSE DB 946 PG 270

NELSON MORALES DB 1457 PG 648

BM #55 (I-4400BB)

BM #2 (I-4400C)

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

FOR –L– PROFILE, SEE SHEET 67 & 68
FOR –Y7– PROFILE, SEE SHEET 89

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NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	23
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

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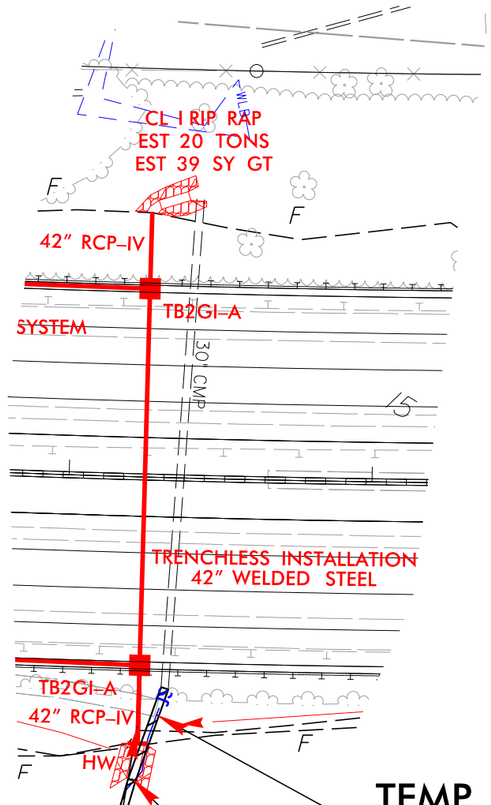
SHEET 76 OF 83

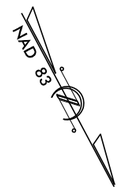
REVISIONS

LEGEND

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER





TEMP. IMPACTS IN SURFACE WATER

SITE 36 | SCH-I

PIPE BURIED 0.7'

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL 23-5

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

FOR -L- PROFILE, SEE SHEET 67 & 68
FOR -Y7- PROFILE, SEE SHEET 89

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PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	23
RW SHEET NO.	

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HYDRAULICS ENGINEER

INCOMPLETE PLANS
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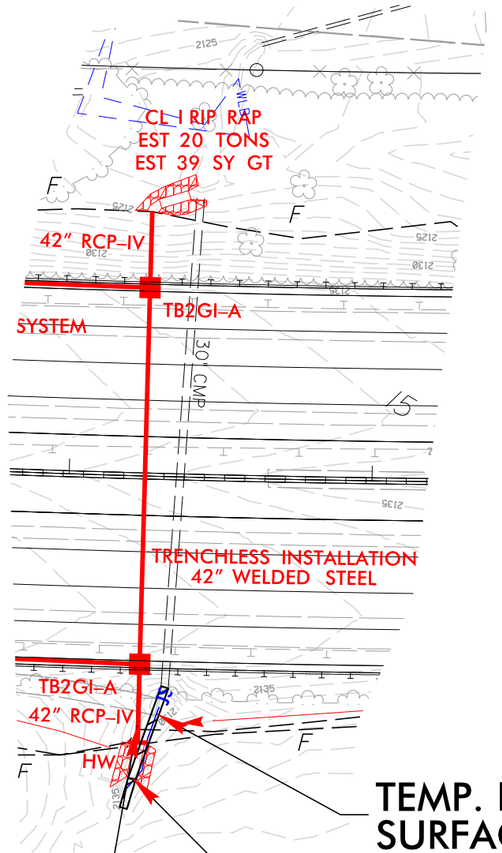
PERMIT DRAWING
SHEET 77 OF 83

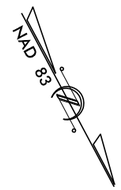
REVISIONS

LEGEND

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER





TEMP. IMPACTS IN SURFACE WATER

SITE 36 | SCH-I

PIPE BURIED 0.7'

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL 23-5

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

FOR -L- PROFILE, SEE SHEET 67 & 68
FOR -Y7- PROFILE, SEE SHEET 89

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PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	23
RW SHEET NO.	

ROADWAY DESIGN ENGINEER

HYDRAULICS ENGINEER

INCOMPLETE PLANS
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SHEET 78 OF 83

LEGEND

SS — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

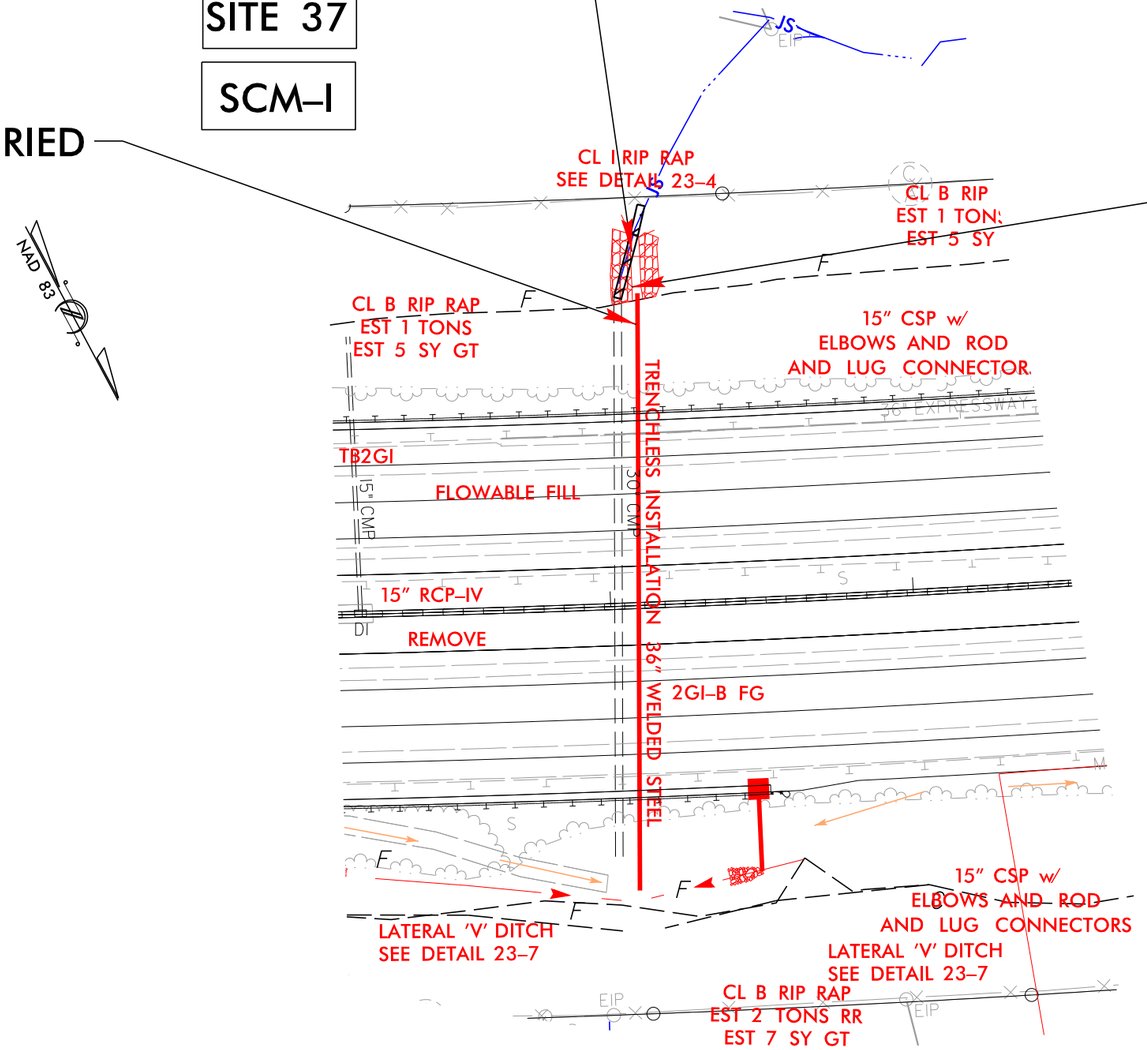
TEMP. IMPACTS IN SURFACE WATER

SITE 37

SCM–I

PIPE NOT BURIED

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL 23–4



50′ 0′ 50′ 100′ 150′

GRAPHIC SCALE

FOR –L– PROFILE, SEE SHEET 67 & 68
FOR –Y7– PROFILE, SEE SHEET 89

REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	23
RW SHEET NO.	

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

INCOMPLETE PLANS
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SHEET 79 OF 83

REVISIONS

LEGEND

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

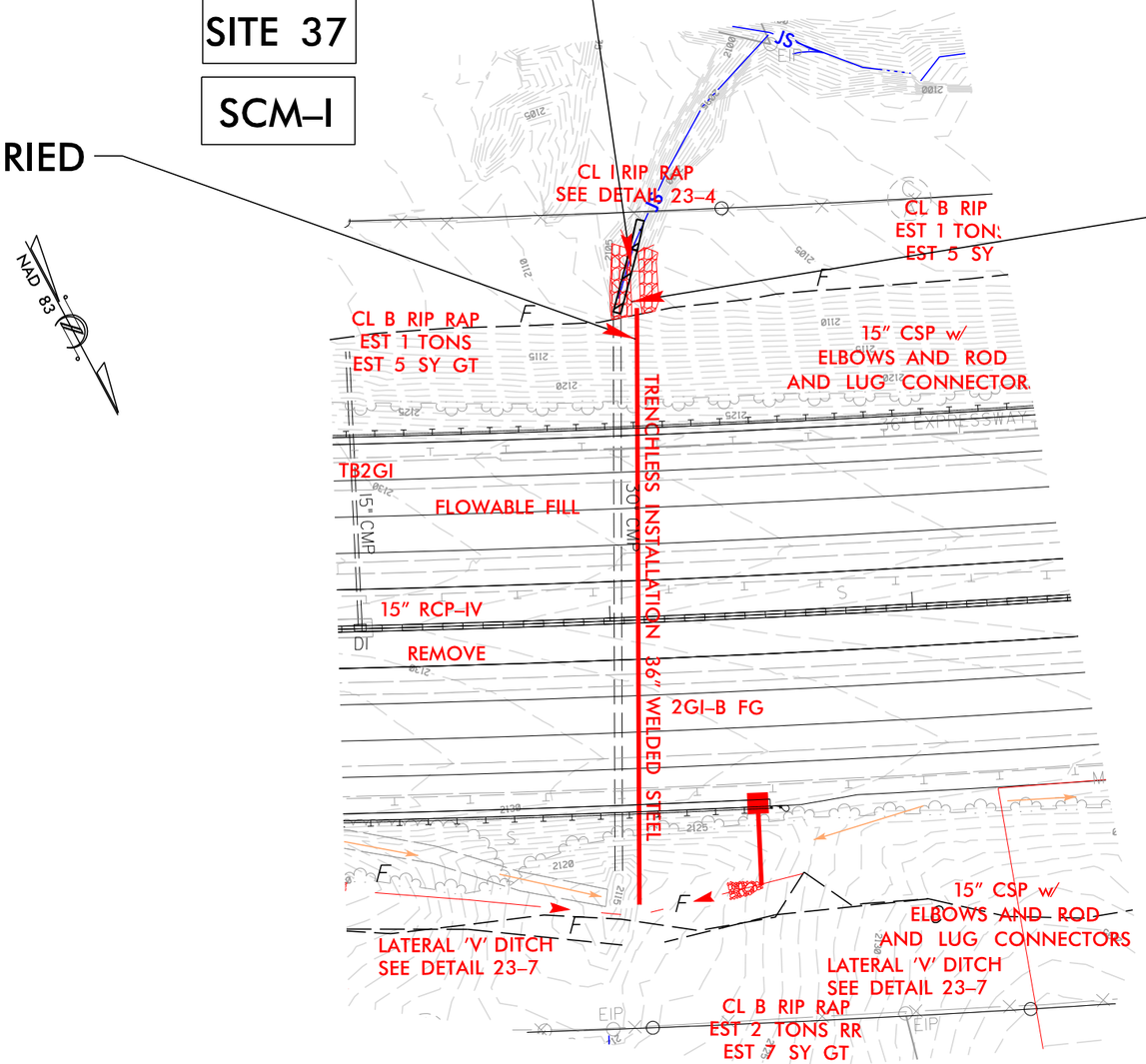
TEMP. IMPACTS IN SURFACE WATER

SITE 37

SCM–I

PIPE NOT BURIED

IMPACTS IN SURFACE WATER (CHANNEL CHANGE) SEE DETAIL 23–4



50′ 0′ 50′ 100′ 150′

GRAPHIC SCALE

FOR –L– PROFILE, SEE SHEET 67 & 68
FOR –Y7– PROFILE, SEE SHEET 89

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$$ENVIRONMENT$$

WETLAND & STREAM IMPACTS

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

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PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	26
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

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INCOMPLETE PLANS
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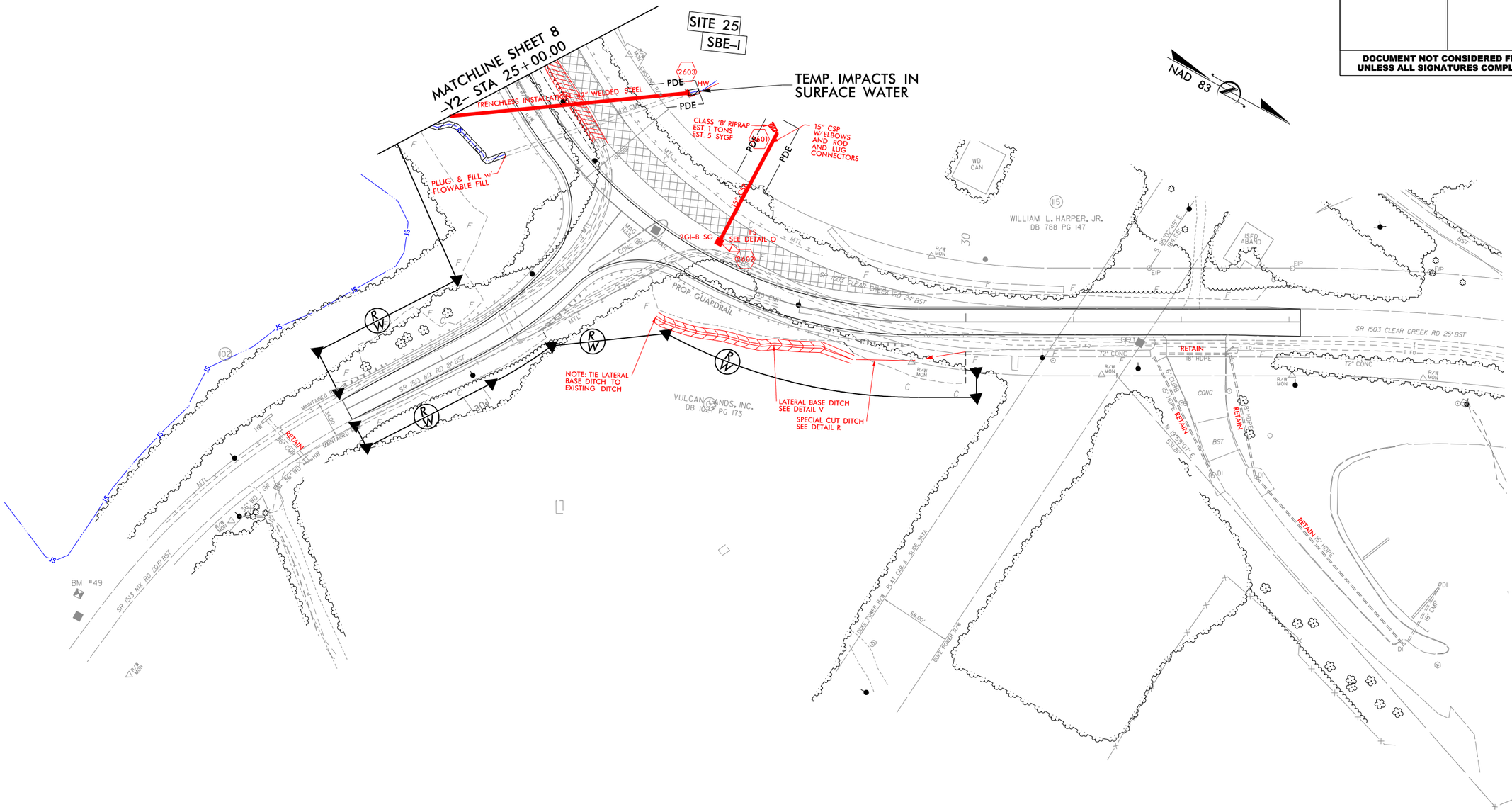
REVISIONS



FOR –Y2– PROFILE, SEE SHEET 85
FOR –Y4– PROFILE, SEE SHEET 86

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$$ENVIRONMENT$$

WETLAND & STREAM IMPACTS

S S DENOTES IMPACTS IN SURFACE WATER

TS TS DENOTES TEMPORARY IMPACTS IN SURFACE WATER

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PERMIT DRAWING
SHEET 81 OF 83

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	26
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

INCOMPLETE PLANS
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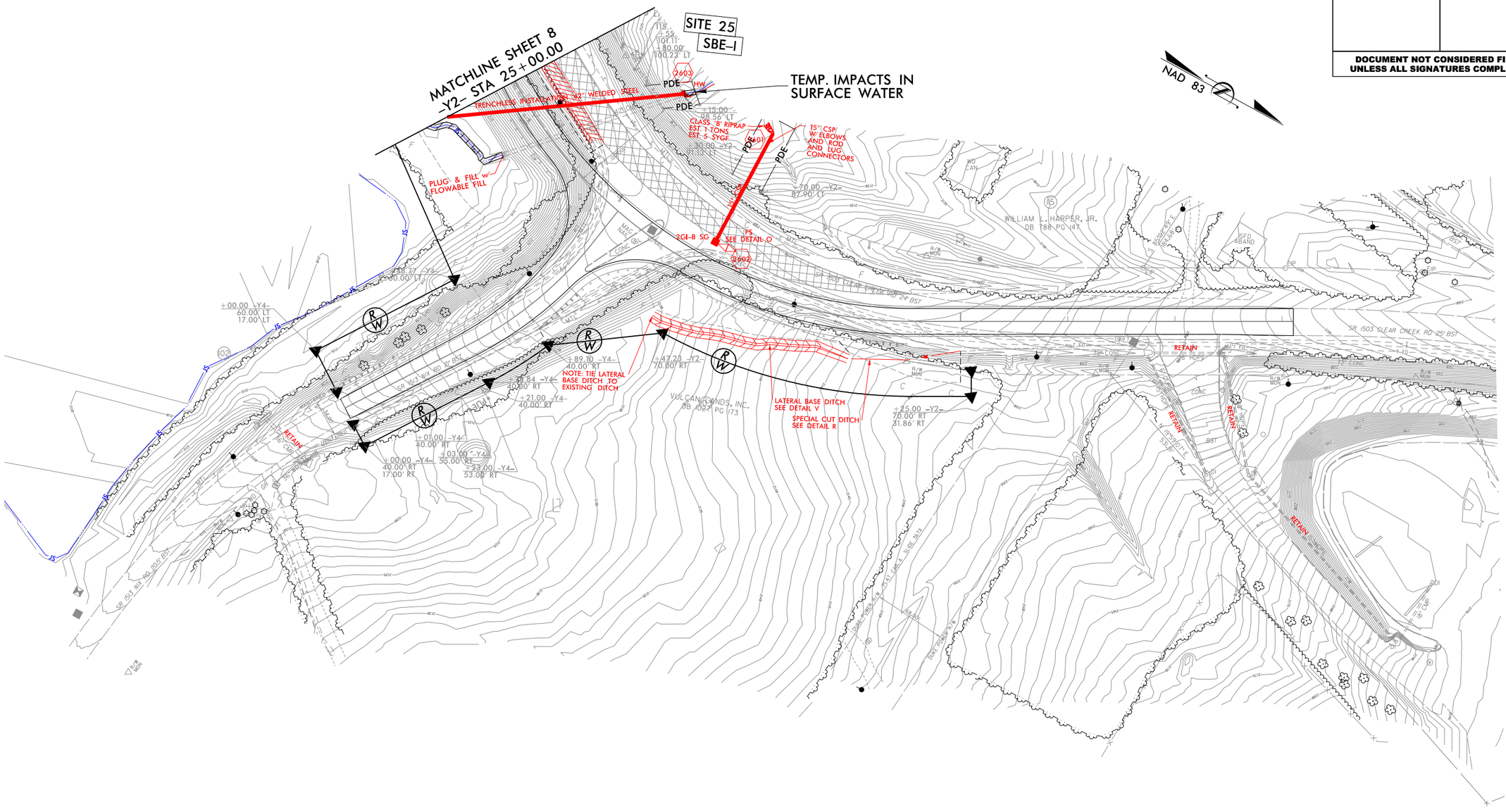

FOR -Y2- PROFILE, SEE SHEET 85
FOR -Y4- PROFILE, SEE SHEET 86

REVISIONS

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$$ENVIRONMENT$$

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 Cherry Branch / SAZ	L 389+41 to 389+62 RT	Proposed 48" WSP								31	10	
1	UT to Cherry Branch / SAZ	L 389+41 to 389+62 RT	Bank Stabilization at outlet of Proposed 48" WSP								15	10	
2	UT to Cherry Branch / SAZ	L 387+24 to 387+34 LT	Proposed 48" WSP and Headwall									10	
3	UT to Cherry Branch / SBA	L 401+94 to 401+97 LT	Bank Stabilization at intlet of Proposed 60" WSP								26		
4	UT to Cherry Branch / SBA	L 402+53 to 403+06 RT	Bank Stabilization at outlet of Proposed 60" WSP								68	10	
5	Allen Branch / SBC	L 419+71 to 419+82 RT	Bank Stabilization at outlet of Proposed 30" CSP								6	10	
6	Clear Creek / SBD	L 421+86 LT to 421+86 RT	Bridge Bank Stabilization								323	20	
7	Allen Branch / SBC	L 419+79 to 420+72 RT	Bank Stabilization at fill slope due to Roadway Widening								87	16	
8	Clear Creek / SBD	L 421+86 to 421+96 RT	Bank Stabilization at outlet of Proposed 15" CSP								4	10	
9	UT to Clear Creek / SBE	L 440+14 to 441+05 RT	Proposed 42" WSP								106		
9	UT to Clear Creek / SBE	L 439+92 to 440+14 RT	Bank Stabilization at outlet of Proposed 42" WSP								12	10	
10	UT to Mud Creek / SBY	L 456+53 to 456+69 LT	Channel Change*1 at Outlet of Proposed 54" RCP								16	7	
11	UT to Mud Creek / SBX	L 456+25 to 456+30 LT	Channel Change*1 at Outlet of Proposed 30" RCP								10	5	
12	WAH	L 499+69 to 499+80 RT	Fill in Wetland due to Roadway Widening	< 0.01									
12	WAH	L 499+63 to 499+77 RT	Proposed 36" CSP and Rip Rap from Proposed 15" CSP in Wetland			< 0.01							
12	WAH	L 499+63 to 499+77 RT	Mechanized Clearing in Wetland due to Roadway Widening				< 0.01						
13	WAP	L 511+99 to 512+63 RT	Fill and Proposed 2' Lat. Base ditch in Wetlands Due to Roadway Widening			0.02							
14	WAM	L 500+70 to 500+97 LT	Mechanized Clearing in Wetland due to Roadway Widening				< 0.01						
15	Featherstone Creek / SBP	L 526+12 to 526+13 LT	Existing 8'x8' Triple Barrel RCBC Extension Due to Roadway Widening								7		
15	Featherstone Creek / SBP	L 526+13 to 526+46 LT	Bank Stabilization along Featherstone Creek Due to Culvert Extension								64	10	
16	Featherstone Creek / SBP	L 525+79 to 525+84 RT	Existing 8'x8' Triple Barrel RCBC Extension Due to Roadway Widening								8		
16	Featherstone Creek / SBP	L 525+79 to 525+82 RT	Bank Stabilization along Featherstone Creek Due to Culvert Extension								55	10	
17	UT to Mud Creek / SBR	Y5 16+72 to 16+55 LT	Bank Stabilization at outlet of Proposed 48" WSP								16	10	
18	UT to Mud Creek / SBO	L 551+83 to 551+90 RT	Proposed 66" WSP								38	10	
19	UT to Mud Creek / SBO	L 551+76 to 551+81 LT	Channel Change at outlet of Proposed 66" WSP								22	10	
20	UT to Mud Creek / SBN	L 557+81 to 558+00 LT	Channel Change*1 at Outlet of Proposed 36" RCP								13	10	
21	UT to Mud Creek / SBI	L 572+69 to 572+75 LT	Channel Change*1 at Outlet of Proposed 66" WSP								22	4	
21	UT to Mud Creek / SBI	L 572+75 to 572+87 LT	Proposed 66" WSP								19		
21	WAT	L 572+96 to 573+09 LT	Fill in Wetland due to Roadway Widening	< 0.01									
21	WAT	L 572+96 to 573+09 LT	Mechanized Clearing in Wetland due to Roadway Widening				< 0.01						
22	UT to Mud Creek / SBS	L 572+23 to 573+77 RT	Stream relocated to Proposed 2' Lateral Base Ditch due to Roadway Widening								168		
23	Byers Creek / SBU	L to RT	Existing 10'x8' Double Barrel RCBC Extension Due to Roadway Widening								15		
23	Byers Creek / SBU	L to RT	Bank Stabilization along Byers Creek Due to Culvert Extension								54	10	
24	Byers Creek / SBU	L to LT	Existing 10'x8' Double Barrel RCBC Extension Due to Roadway Widening								10		
TOTALS*:				< 0.01		0.03	0.02				1215	192	

*Rounded totals are sum of actual impacts

NOTES:
*1: Emedding Riprap
*2: No Riprap in Channel

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
7/12/2019
Henderson County
I-4400BB

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)
24	Byers Creek / SBU	L to LT	Bank Stabilization along Byers Creek Due to Culvert Extension								48	10	
25	UT to Clear Creek / SBE	Y2 26+20 to 26+29 LT	Proposed 42" WSP and Headwall									10	
26	UT to Byers Creek / SBT	L 590+00 to 590+20 LT	Bank Stabilization at outlet of Proposed 36" RCP								12	10	
26	UT to Byers Creek / SBT	L 588+23 to 588+37 LT	Bank Stabilization along UT to Byers Creek Due to Culvert Extension								15		
27	UT to Byers Creek / SCB	L 610+50 to 610+75 LT	Channel Change*1 between outlet of Existing 60" CMP and proposed 66" WSP								23	10	
28	UT to Byers Creek / SCB	L 611+30 to 611+65 RT	Channel Change*2 between inlet of Existing 60" CMP and proposed 66" WSP								20	10	
29	UT to Byers Creek / SCJ	L 628+20 to 628+35 LT	Channel Change*2 between outlet of Existing 30" CMP and proposed 36" WSP								15	7	
30	UT to Byers Creek / SCJ	L 628+20 to 628+35 RT	Channel Change*2 between inlet of Existing 30" CMP and proposed 36" WSP								25	10	
31	UT to Byers Creek / SCA	L 632+90 to 633+10 LT	Channel Change*2 between outlet of Existing 48" CMP and proposed 48" WSP								30	14	
32	UT to Byers Creek / SCA	L 633+20 to 633+30 RT	Channel Change*2 between inlet of Existing 48" CMP and proposed 48" WSP								40	10	
33	UT to Byers Creek / SCA	L 23+60 to 23+75 RT (-Y7-)	Bank Stabilization at outlet of Proposed 24" RCP								18	10	
34	UT to Byers Creek / SCD	L 25+25 to 25+35 RT (-Y7-)	Bank Stabilization at outlet of Proposed 36" RCP								10	10	
35	UT to Byers Creek / SCG	L 21+50 to 21+75 RT (-Y7-)	Bank Stabilization at outlet of Proposed 30" RCP								51	10	
36	UT to Byers Creek / SCH	L 642+20 to 642+30 RT	Channel Change*2 between inlet of Existing 30" CMP and proposed 42" WSP								10	10	
38	UT to Mud Creek / SBG	L 493+81 to 494+22 RT	Bank Stabilization along UT to Mud Creek								39	10	
39	UT to Mud Creek / SBF	L 494+27 to 494+50 RT	Bank Stabilization along UT to Mud Creek								12	10	
40	UT to Mud Creek / SBG	L 495+54 to 495+78 LT	Bank Stabilization along UT to Mud Creek								48		
41	UT to Mud Creek / SBI	L 573+76 to 573+81 RT	Proposed 66" WSP								12		
41	UT to Mud Creek / SBI	L 573+81 to 573+88 RT	Bank Stabilization along UT to Mud Creek								16	10	
TOTALS*:											444	161	
TOTALS FOR I-4400BB:				< 0.01		0.03	0.82				2956	1601	

*Rounded totals are sum of actual impacts

NOTES:

*1: Emedding Riprap
*2: No Riprap in Channel

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
7/12/2019
Henderson County
I-4400BB

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

General Project Information

WBS Element:	34232.1.1	**TIP Number:**	I-4400C	**Project Type:** Roadway Widening	**Date:** 7/16/2019
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):**	Henderson		
River Basin(s):	French Broad	**CAMA County?**	No		
Wetlands within Project Limits?	Yes				

Project Description

Project Length (lin. miles or feet):	3.44	**Surrounding Land Use:**	Suburan
	Proposed Project	**Existing Site**	
Project Built-Upon Area (ac.)	115.6 ac.	71.6 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: 91000 Year: 2040	Existing: 65,900	Year: 2019

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

I-4400C involves the widening of Interstate I-26 from a 4-lane, median-divided facility to an 8-lane, median-divided facility from 0.5 mile south of US 25 (Asheville Highway) to 0.3 mile south of NC 280 (Airport Road) and ties into the I-4700 TIP Project. 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 bridge crossing of Cane Creek 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 2 locations to reduce the extent of impacts along the project corridor. Rip Rap pads were used at pipes outlets throughout the project to reduce water velocities into wetlands and jurisdictional streams. Special design “ConcreteEnergy Dissipators” were used at strategic locations where pipe outlets were adjacent to jurisdictional streams. The Sediment and Erosion Control Plan for I-4400C 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 has been implemented throughout I-4400C and the additional sections of the I-4400 corridor to the maximum extent practical. Special Design diches have been flattened from 2:1 to 3:1 in locations that do not require additional right of way. Due to the challenging terrain, some ditches included in the"Swales" tab do not meet all the swale criteria, but will provide some level of stormwater treatment. Rip rap pads are used at the outlets of pipes to dissipate energy and reduce velocity before entering a ditch or a stream, however they are not a designed as a HEC14 Rip Rap Energy Dissipator Basin Per NCDOT Roadside Environmental Unit's request, Harzardous Spill Basins are utilized to contain fuel spills from the truck parking lots at the two redesigned Rest Areas.

Waterbody Information

Surface Water Body (1):	SCN - UT to Mud Creek	**NCDWR Stream Index No.:**	6-55		
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:	SCN	**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: 34232.1.1 **TIP No.:** I-4400C **County(ies):** Henderson

Additional Waterbody Information

Surface Water Body (2):	SCK - UT to Mud Creek		**NCDWR Stream Index No.:**	6-55		
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:	SCK			**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):	SCL - UT to Mud Creek		**NCDWR Stream Index No.:**	6-55		
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:	SCL			**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):	SCO - UT to Mud Creek		**NCDWR Stream Index No.:**	6-55		
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:	SCO			**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):	SCP - UT to Mud Creek		**NCDWR Stream Index No.:**	6-55		
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:	SCP			**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: 34232.1.1 **TIP No.:** I-4400C **County(ies):** Henderson

Additional Waterbody Information

Surface Water Body (6):	SEN - UT to Mud Creek		**NCDWR Stream Index No.:**	6-55		
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:	SEN			**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):	SCQ - UT to Mud Creek		**NCDWR Stream Index No.:**	6-55		
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:	SCQ			**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):	SCT - UT to Mud Creek		**NCDWR Stream Index No.:**	6-55		
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:	SCT			**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):	SCR - UT to Mud Creek		**NCDWR Stream Index No.:**	6-55		
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:	SCR			**Buffer Rules in Effect:**		
Project Includes Bridge Spanning Water Body?	No	**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)		(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)						

WBS Element: 34232.1.1 **TIP No.:** I-4400C **County(ies):** Henderson

Additional Waterbody Information

Surface Water Body (10):	SCU - UT to Cane Creek		**NCDWR Stream Index No.:**	6-57-(9)		
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:	SCU			**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):	SCX - UT to Cane Creek		**NCDWR Stream Index No.:**	6-57-(9)		
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:	SCX			**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):	SCW - CANE CREEK		**NCDWR Stream Index No.:**	6-57-(9)		
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:	CANE CREEK			**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):	SCZ - UT to Kimsey Creek		**NCDWR Stream Index No.:**	6-57-22		
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:	SCZ			**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: 34232.1.1 **TIP No.:** I-4400C **County(ies):** Henderson

Additional Waterbody Information

Surface Water Body (14):	SCY - Kimsey Creek		**NCDWR Stream Index No.:**	6-57-22		
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:	SCY			**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):	SDR - UT to Kimsey Creek		**NCDWR Stream Index No.:**	6-57-22		
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:	SDR			**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):	S1 - UT to Kimsey Creek		**NCDWR Stream Index No.:**	6-57-22		
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:	S1			**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):			**NCDWR Stream Index No.:**			
NCDWR Surface Water Classification for Water Body		**Primary Classification:**				
		Supplemental Classification:				
Other Stream Classification:						
Impairments:						
Aquatic T&E Species?		Comments:				
NRTR Stream ID:				**Buffer Rules in Effect:**	N/A	
Project Includes Bridge Spanning Water Body?		**Deck Drains Discharge Over Buffer?**	N/A	**Dissipator Pads Provided in Buffer?**	N/A	
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)						

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

WBS Element: 34232.1.1 **TIP No.:** I-4400C **County(ies):** 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?
4	-L- Sta. 657+80 RT 35.39801,-82.50265	(2)SCK - UT to Mud Creek	2.0	2.0	2.0	2.6	258	584	5.08%	5.4	2.6	7.2	5.7	No	No
4	-L- Sta. 658+01 RT 35.39802,-82.50268	(2)SCK - UT to Mud Creek	2.0	2.0	2.0	0.5	50	115	1.67%	0.9	1.5	1.2	1.6	No	No
4	-L- Sta. 656+29 LT 35.39695,-82.50255	(2)SCK - UT to Mud Creek	2.0	2.0	2.0	14.5	1450	174	6.70%	31.7	6.6	43.0	7.2	No	No
5	-Y10RPC- Sta. 12+30 RT 35.39880,-82.50540	(5)SCP - UT to Mud Creek	2.0	2.0	2.0	0.5	50	484	18.57%	0.8	3.2	1.2	3.6	No	No
6	-Y10RPA- Sta. 16+08 RT 35.40028,-82.51124	(7)SCQ - UT to Mud Creek	2.0	2.0	2.0	14.4	1438	292	5.60%	32.7	6.2	44.0	6.7	No	No
6	-Y10RPA- Sta. 12+70 RT 35.40100,-82.51195	(8)SCT - UT to Mud Creek	2.0	2.0	2.0	13.9	1388	420	3.86%	27.5	4.2	37.0	4.5	No	No
9	-L- Sta. 727+00 LT 35.41026,-82.51894	(10)SCU - UT to Cane	2.0	3.0	3.0	10.4	1043	1688	0.35%	16.9	1.9	23.0	2.0	No	No
9	-L- Sta. 727+10 RT 35.41028,-82.51897	(10)SCU - UT to Cane	2.0	3.0	3.0	1.4	139	210	1.13%	4.6	2.1	6.2	2.2	No	No
11	-L- Sta. 755+40 RT 35.41720,-82.52316	(12)SCW - CANE	7.0	2.0	2.0	160.0	16000	3040	0.50%	120.0	3.5	210.0	4.0	No	No
12	-L- Sta. 769+25 LT 35.42020,-82.52628	(14)SCY - Kimsey	2.0	2.0	2.0	1.0	97	485	0.32%	1.7	1.0	2.3	1.1	No	No

Additional Comments

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

WBS Element: **TIP No.:** I-4400C **County(ies):** Henderson

Preformed Scour Holes and Energy Dissipators

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Energy Dissipator Type	Riprap Type	Drainage Area (ac)	Conveyance Structure	Pipe/Structure Dimensions (in)	Q10 (cfs)	V10 (fps)	BMP Associated w/ Buffer Rules?
6	-Y10RPA- Sta. 16+08 RT 35.40030,-82.51120	(7)SCQ	Riprap Energy Dissipator Basin	Class I	22.1	Pipe	48	36.0	3.1	No
6	-Y10RPA- Sta. 13+59 RT 35.40084,-82.51172	(8)SCT	Riprap Energy Dissipator Basin	Class 'B'	0.5	Pipe	15	2.7	0.5	No
9	-L- Sta. 719+65 RT 35.408808,-82.517098	WBG	Concrete Energy Dissipator	Class 'B'	0.4	Pipe	15	1.8	0.7	No
9	-L- Sta. 723+67 RT 35.409753,-82.517796	WBG	Concrete Energy Dissipator	Class 'B'	0.4	Pipe	15	1.8	0.7	No
9	-L- Sta. 726+95 LT 35.41026,-82.51891	(10)SCU	Riprap Energy Dissipator Basin	Class I	12.4	Pipe	36	15.0	0.6	No
11	-L- Sta. 747+68 LT 35.415114,-82.522546	WBI	Concrete Energy Dissipator	Class 'B'	1.0	Pipe	15	5.3	1.0	No
12	-L- Sta. 765+47 LT 35.41932,-82.52560	(13)SCZ	Riprap Energy Dissipator Basin	Class I	82.0	Culvert	2 x 60	94.0	2.3	No
12	-L- Sta. 766+70 RT 35.419919,-82.525168	WBP	Concrete Energy Dissipator	Class 'B'	0.5	Pipe	15	2.3	0.8	No
14	-L- Sta. 790+78 RT 35.42599,-82.52785	(16)S1	Riprap Energy Dissipator Basin	Class 'B'	20.0	Pipe	42	73.2	2.6	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.

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

WBS Element: 34232.1.1 **TIP No.:** I-4400C **County(ies):** Henderson

Level Spreaders, Hazardous Spill Basins, and Forebays

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Level Spreader, Hazardous Spill Basin, or Forebay?	Drainage Area (ac)	New Built-Upon Area (ac)	Required / Minimum Treatment			Treatment Achieved		BMP Associated w/ Buffer Rules?
14	-L4- Sta. 23+04, 70 RT 35.42482, -82.52904	(16)S1 - UT to Kimsey Creek	Hazardous Spill Basin	4.56	2.79	2yr, tc=10 min, td= 5 min storm runoff + 1,550 cf (cf)	5076.0	cf	8678.0	cf	N/A
14	-L1- Sta. 14+42, 80' LT 35.42633, -82.52769	(16)S1 - UT to Kimsey Creek	Hazardous Spill Basin	5.35	2.31	2yr, tc=10 min, td= 5 min storm runoff + 1,550 cf (cf)	5264.0	cf	8133.0	cf	N/A

*Hazardous spill basins are pollution prevention measures designed for spill containment rather than stormwater treatment. Under Required / Minimum Treatment and Treatment Achieved, provide the minimum required volume and the actual HSB volume, respectively. Refer to the NCDOT Stormwater Best Management Practices Toolbox (2014) for design guidance.

Additional Comments

7/24/2017

TIP PROJECT: I-4400C

CONTRACT: C204265

7/24/2017
I4400C_RDY_TSH.dgn
3:11 PM

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BUNCOMBE & HENDERSON COUNTIES

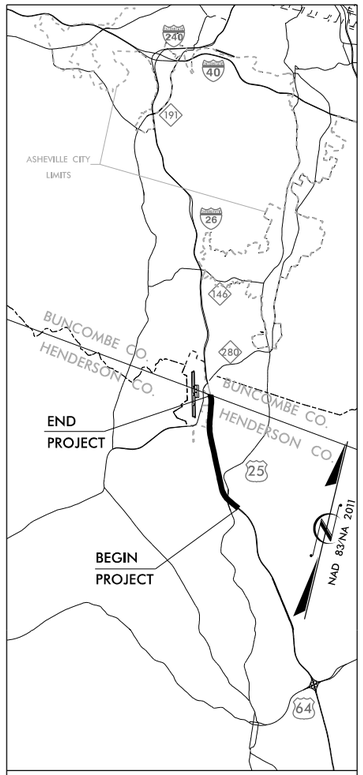
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-4400C	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34232.1.FS4	NHPP-026-1(200)13	I-4400C (P.E.)
34232.2.5	N/A	I-4400C (R/W)
34232.2.7	N/A	I-4400C (UTIL)
34232.3.5	NHPP-026-1(200)13	I-4400C (CONST.)

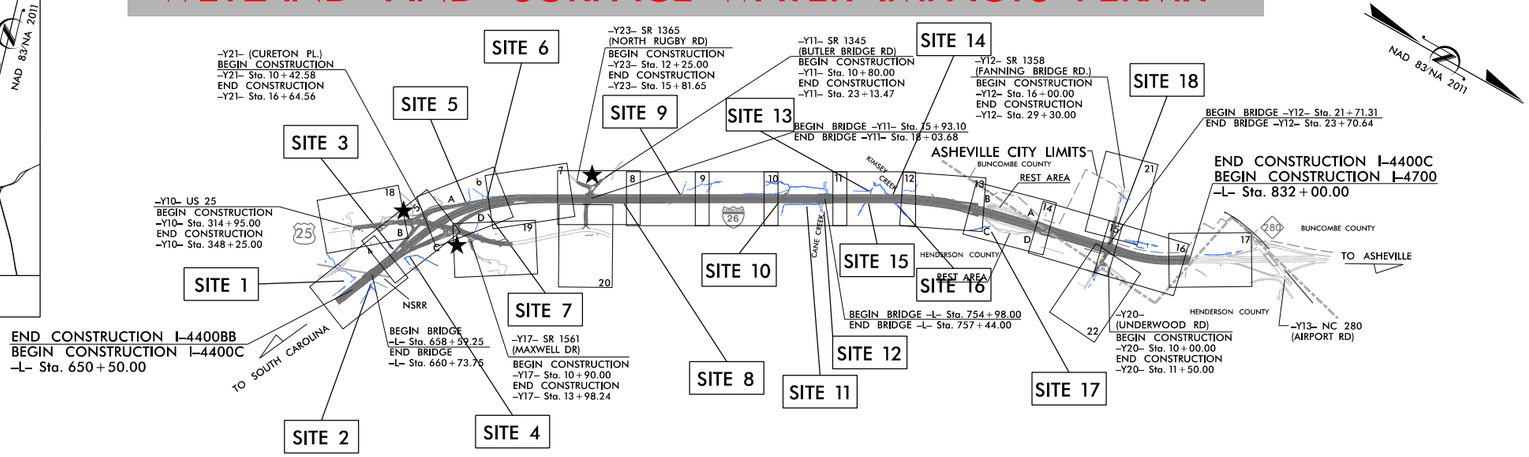
PERMIT DRAWING
SHEET 1 OF 43

LOCATION: I-26 BETWEEN US 25 (ASHEVILLE HIGHWAY) TO SOUTH OF NC 280
TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, CULVERTS, RETAINING WALLS, SOUND WALLS, REST AREA, SIGNALS, AND SIGNING

WETLAND AND SURFACE WATER IMPACTS PERMIT



VICINITY MAP



NOTE:
1. THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.

★ PROPOSED TRAFFIC SIGNAL

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 2019 = 65,900
ADT 2040 = 91,000
K = 10%
D = 55%
T = 15% *
V = 65 MPH**
* TTST = 11% DUAL 4%
**70MPH SOUTH OF US-25
FUNC CLASS = INTERSTATE
STATEWIDE TIER

PROJECT LENGTH

TOTAL LENGTH OF ROADWAY TIP PROJECT
I-4400C = 3.351 MI

TOTAL LENGTH OF STRUCTURES OF TIP PROJECT
I-4400C = 0.087 MI

TOTAL LENGTH OF TIP PROJECT
I-4400C = 3.438 MI
NOTE: LENGTHS WERE CALCULATED USING THE L 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:
JUNE 29, 2018
(I-4400C)

LETTING DATE:
SEPTEMBER 17, 2019

JOSEPH OLSON, P.E.
PROJECT ENGINEER

MARC A. WHITMORE, P.E.
PROJECT DESIGN ENGINEER

WANDA AUSTIN, P.E.
NCDOT CONTACT

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 046784 ENGINEER MARC A. WHITMORE P.E.

SIGNATURE:

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047948 ENGINEER JOHN M. BLANCETT P.E.

SIGNATURE:

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

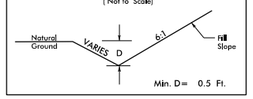
DITCH DETAILS

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-4400C	2D-1
R/W SHEET NO.	
	HYDRAULICS ENGINEER

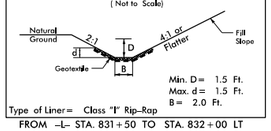
PERMIT DRAWING SHEET 2 OF 43

DETAIL A
SPECIAL LATERAL "V" DITCH
(Not to Scale)



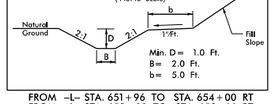
FROM –L– STA. 650+50 TO STA. 651+96 RT

DETAIL B
SPECIAL LATERAL BASE DITCH
(Not to Scale)



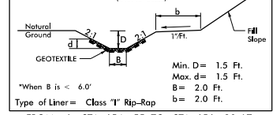
Type of Liner= Class "I" Rip-Rap
FROM –L– STA. 831+50 TO STA. 832+00 LT

DETAIL C
LATERAL BASE DITCH
(Not to Scale)



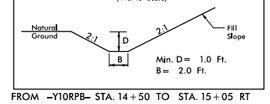
FROM –L– STA. 651+96 TO STA. 654+00 RT
FROM –L– STA. 658+00 TO STA. 659+16 RT
FROM –L– STA. 710+00 TO STA. 711+00 LT
FROM –L– STA. 715+00 TO STA. 716+00 LT
FROM –L– STA. 770+50 TO STA. 774+10 LT
FROM –Y10RPC– STA. 10+00 TO STA. 12+35 RT
FROM –Y10RPA– STA. 18+50 TO STA. 19+00 RT

DETAIL D
LATERAL BASE DITCH
(Not to Scale)



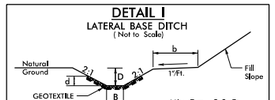
*When B is < 6.0'
Type of Liner= Class "I" Rip-Rap
FROM –L– STA. 654+55 TO STA. 656+29 LT
FROM –L– STA. 690+25 TO STA. 691+25 LT
FROM –Y10RPA– STA. 10+00 TO STA. 12+70 RT

DETAIL E
SPECIAL LATERAL BASE DITCH
(Not to Scale)



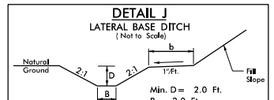
FROM –Y10RPB– STA. 14+50 TO STA. 15+05 RT

DETAIL I
LATERAL BASE DITCH
(Not to Scale)



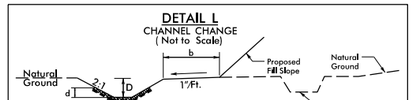
*When B is < 6.0'
Type of Liner= Class "I" Rip-Rap
FROM –Y10RPA– STA. 16+08 TO STA. 18+50 RT

DETAIL J
LATERAL BASE DITCH
(Not to Scale)



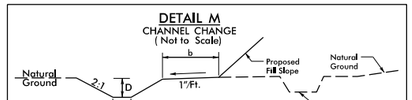
FROM –L– STA. 716+00 TO STA. 719+50 LT

DETAIL L
CHANNEL CHANGE
(Not to Scale)



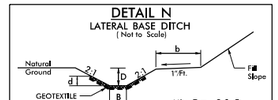
Type of Liner= Class "II" Rip-Rap
FROM –L– STA. 754+50 TO STA. 755+16 RT

DETAIL M
CHANNEL CHANGE
(Not to Scale)



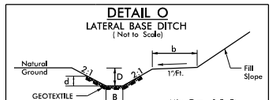
FROM –L– STA. 747+50 TO STA. 755+40 RT

DETAIL N
LATERAL BASE DITCH
(Not to Scale)



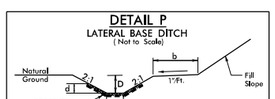
*When B is < 6.0'
Type of Liner= Class "B" Rip-Rap
FROM –L– STA. 743+50 TO STA. 745+00 LT

DETAIL O
LATERAL BASE DITCH
(Not to Scale)



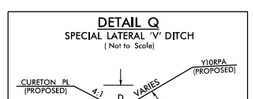
*When B is < 6.0'
Type of Liner= Class "B" Rip-Rap
FROM –L– STA. 745+00 TO STA. 746+94 LT

DETAIL P
LATERAL BASE DITCH
(Not to Scale)



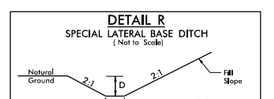
*When B is < 6.0'
Type of Liner= Class "I" Rip-Rap
FROM –L– STA. 654+00 TO STA. 657+80 RT
FROM –Y10RPC– STA. 15+00 TO STA. 16+50 RT

DETAIL Q
SPECIAL LATERAL "V" DITCH
(Not to Scale)



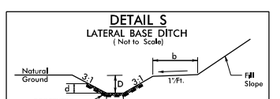
FROM –Y10RPA– STA. 27+30 TO STA. 27+38 RT &
FROM –Y10RPA_SPUR_RT– STA. 10+00 TO STA. 11+56 RT

DETAIL R
SPECIAL LATERAL BASE DITCH
(Not to Scale)



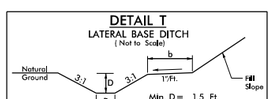
FROM –L– STA. 830+00 TO STA. 831+50 LT

DETAIL S
LATERAL BASE DITCH
(Not to Scale)



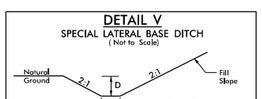
*When B is < 6.0'
Type of Liner= Class "I" Rip-Rap
FROM –L– STA. 774+40 TO STA. 776+00 RT

DETAIL T
LATERAL BASE DITCH
(Not to Scale)



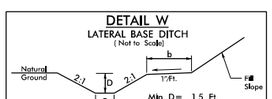
FROM –L– STA. 769+15 TO STA. 770+84 RT

DETAIL V
SPECIAL LATERAL BASE DITCH
(Not to Scale)



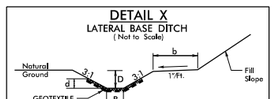
FROM –Y10RPD– STA. 19+00 TO STA. 21+20

DETAIL W
LATERAL BASE DITCH
(Not to Scale)



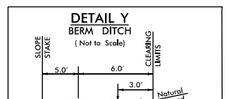
FROM –L– STA. 758+00 TO STA. 761+76 LT

DETAIL X
LATERAL BASE DITCH
(Not to Scale)



*When B is < 6.0'
Type of Liner= Class "I" Rip-Rap
FROM –L– STA. 771+10 TO STA. 774+40 RT

DETAIL Y
BERM DITCH
(Not to Scale)

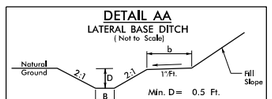


FROM –L– STA. 695+81 TO STA. 701+25 RT

DETAIL Z
BERM DITCH
(Not to Scale)

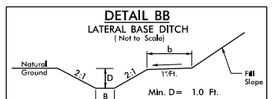
FROM –L– STA. 688+30 TO STA. 695+81 RT

DETAIL AA
LATERAL BASE DITCH
(Not to Scale)



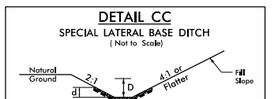
FROM –Y10RPB– STA. 15+05 TO STA. 17+00 RT

DETAIL BB
LATERAL BASE DITCH
(Not to Scale)



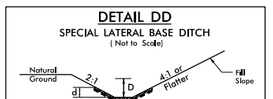
FROM –L– STA. 740+00 TO STA. 747+50 RT
FROM –L– STA. 769+25 TO STA. 770+50 LT
FROM –Y10RPD– STA. 21+20 TO STA. 25+10 RT

DETAIL CC
SPECIAL LATERAL BASE DITCH
(Not to Scale)



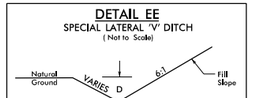
Type of Liner= Class "I" Rip-Rap
FROM –REST B– STA. 10+00 TO STA. 12+00 LT

DETAIL DD
SPECIAL LATERAL BASE DITCH
(Not to Scale)



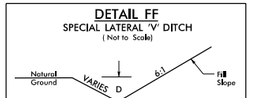
Type of Liner= Class "I" Rip-Rap
FROM –REST B– STA. 12+00 TO STA. 12+80 LT

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



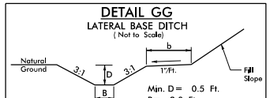
FROM –L– STA. 826+50 TO STA. 828+60 RT

DETAIL FF
SPECIAL LATERAL "V" DITCH
(Not to Scale)



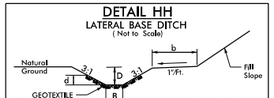
FROM –L– STA. 828+62 TO STA. 832+00 RT

DETAIL GG
LATERAL BASE DITCH
(Not to Scale)



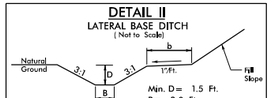
FROM –L– STA. 661+36 TO STA. 663+32 RT
FROM –L– STA. 663+34 TO STA. 664+49 RT
FROM –L– STA. 708+50 TO STA. 708+85 RT
FROM –L– STA. 734+76 TO STA. 737+10 RT
FROM –L– STA. 737+10 TO STA. 740+00 RT
FROM –L– STA. 827+50 TO STA. 830+00 LT

DETAIL HH
LATERAL BASE DITCH
(Not to Scale)



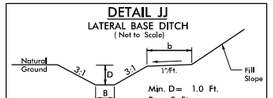
*When B is < 6.0'
Type of Liner= Class "I" Rip-Rap
FROM –Y10RPC– STA. 13+77 TO STA. 17+00 RT

DETAIL II
LATERAL BASE DITCH
(Not to Scale)



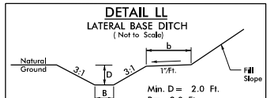
FROM –L– STA. 708+85 TO STA. 716+50 RT
FROM –L– STA. 725+00 TO STA. 734+74 RT
FROM –L– STA. 719+50 TO STA. 723+00 LT

DETAIL JJ
LATERAL BASE DITCH
(Not to Scale)



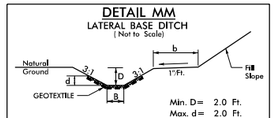
FROM –L– STA. 711+00 TO STA. 715+00 LT
FROM –L– STA. 727+10 TO STA. 729+20 LT
FROM –L– STA. 825+63 TO STA. 827+50 LT

DETAIL LL
LATERAL BASE DITCH
(Not to Scale)



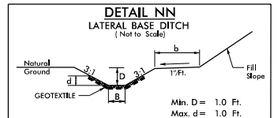
FROM –L– STA. 723+00 TO STA. 727+05 LT

DETAIL MM
LATERAL BASE DITCH
(Not to Scale)



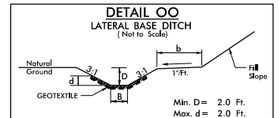
*When B is < 6.0'
Type of Liner= Class "I" Rip-Rap
FROM –L– STA. 778+00 TO STA. 780+43 LT

DETAIL NN
LATERAL BASE DITCH
(Not to Scale)



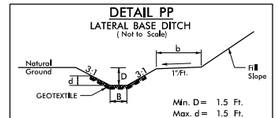
*When B is < 6.0'
Type of Liner= Class "B" Rip-Rap
FROM –L– STA. 736+40 TO STA. 737+00 LT

DETAIL OO
LATERAL BASE DITCH
(Not to Scale)



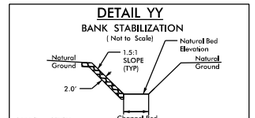
*When B is < 6.0'
Type of Liner= Class "B" Rip-Rap
FROM –L– STA. 737+00 TO STA. 742+00 LT

DETAIL PP
LATERAL BASE DITCH
(Not to Scale)



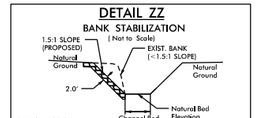
*When B is < 6.0'
Type of Liner= Class "B" Rip-Rap
FROM –L– STA. 742+00 TO STA. 743+50 LT

DETAIL YY
BANK STABILIZATION
(Not to Scale)



–L– STA. 748+00 RT
–L– STA. 755+53 RT
–L– STA. 756+71 LT

DETAIL ZZ
BANK STABILIZATION
(Not to Scale)



EST. 74 CY EXCAVATION
EST. 191 TONS CLASS II RIPRAP
–L– STA. 756+66 RT

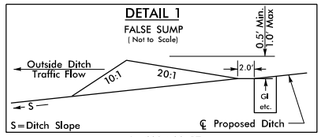
DITCH DETAILS

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

PROJECT REFERENCE NO.	SHEET NO.
I-4400C	2D-1
R/W SHEET NO.	
	HYDRAULICS ENGINEER

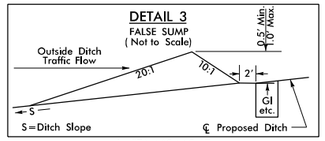
PERMIT DRAWING
SHEET 2A OF 43

DETAIL 1
FALSE SUMP
(Not to Scale)



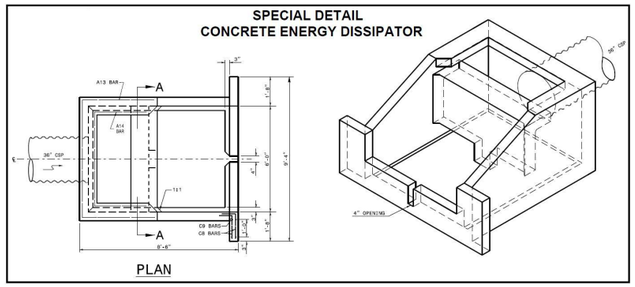
–L– 682+83 RT
–L– 724+98 RT
–L– 789+61 LT
–L– 793+11 LT
–RESTA– 10+65 RT
–L– 810+57 LT

DETAIL 3
FALSE SUMP
(Not to Scale)



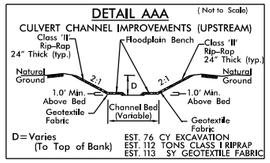
–L– STA. 669+65 LT
–L– STA. 673+90 LT
–L– STA. 678+60 LT
–L– STA. 689+83 RT
–L– STA. 699+85 RT
–L– STA. 704+19 RT
–L– STA. 783+63 RT
–L– STA. 789+60 RT
–L– STA. 793+11 RT
–L– STA. 799+09 RT
–L– STA. 800+84 RT
–Y10RPD– STA. 14+69 LT
–Y10RPD– STA. 11+13 LT

SPECIAL DETAIL
CONCRETE ENERGY DISSIPATOR



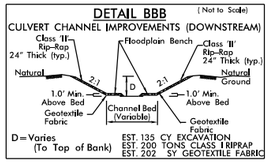
PLAN

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



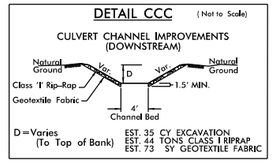
D=Varies (To Top of Bank)
EST. 76 CY EXCAVATION
EST. 112 TONS CLASS I RIPRAP
EST. 113 SY GEOTEXTILE FABRIC

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



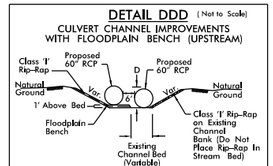
D=Varies (To Top of Bank)
EST. 135 CY EXCAVATION
EST. 200 TONS CLASS I RIPRAP
EST. 202 SY GEOTEXTILE FABRIC

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



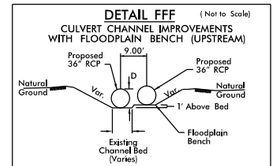
D=Varies (To Top of Bank)
EST. 35 CY EXCAVATION
EST. 44 TONS CLASS I RIPRAP
EST. 73 SY GEOTEXTILE FABRIC

DETAIL DDD
(Not to Scale)
CULVERT CHANNEL IMPROVEMENTS
WITH FLOODPLAIN BENCH (UPSTREAM)



D=Varies (To Top of Bank)
EST. 35 CY EXCAVATION
EST. 25 TONS CLASS 'I' RIPRAP
EST. 42 SY GEOTEXTILE FABRIC

DETAIL FFF
(Not to Scale)
CULVERT CHANNEL IMPROVEMENTS
WITH FLOODPLAIN BENCH (UPSTREAM)



D=Varies (To Top of Bank)
EST. 28 CY EXCAVATION

BANK STABILIZATION
DETAIL YYYY
(Not to Scale)

D=Varies (To Top of Bank)

7/19/2017

WETLAND & STREAM IMPACTS

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-4400C	4
RW SHEET NO.	
ROADWAY DESIGN	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 3 OF 43

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

NAD 83/NA 2011

SITE 1 | SCN | SCK

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL YYYY

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

PIPE NOT BURIED

IMPACTS IN SURFACE WATER (60" RCP)

TEMP. IMPACTS IN SURFACE WATER

PIPE NOT BURIED

MATCHLINE I-4400BB -L- STA 650+50.00

MATCHLINE SHEET 5 -L- STA 664+00.00

SITE 2 | SCK

SITE 2 | SCL

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL EEE

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (60" CMP)

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

NOTE:
TEMPORARY SHORING SHOWN FOR INFORMATION ONLY. FOR MORE INFORMATION SEE TMP SHEETS.

FOR CURVE DETAILS, SEE SHEET 2B-2
FOR -EY1- PAVEMENT/BRIDGE RELATIONSHIP SKETCH, SEE SHEET 2B-3
FOR DITCH DETAILS, SEE SHEETS 2D-1, 2D-2
FOR -L- PROFILE, SEE SHEET 23
FOR RETAINING WALL -RW99-, SEE SHEET W-1
FOR RETAINING WALL -RW100-, SEE SHEET W-2

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

7/12/2018
I-4400C_HYD_PRM_PSH_04.dgn
HNTB

7/19/2017

WETLAND & STREAM IMPACTS

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-4400C	4
RW SHEET NO.	
ROADWAY DESIGN	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 4 OF 43

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

NAD 83/NA 2011

SITE 1
SCN | SCK

SITE 2
SCK

SITE 2
SCL

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL YYYY

IMPACTS IN SURFACE WATER (60" RCP)

PIPE NOT BURIED

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

TEMP. IMPACTS IN SURFACE WATER

PIPE NOT BURIED

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL EEE

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (60" CMP)

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

PIPE NOT BURIED

MATCHLINE I-4400BB
-L- STA 650+50.00

MATCHLINE SHEET 5
-L- STA 664+00.00

NOTE:
TEMPORARY SHORING SHOWN FOR INFORMATION ONLY. FOR MORE INFORMATION SEE TMP SHEETS.

FOR CURVE DETAILS, SEE SHEET 2B-2
FOR -EY1- PAVEMENT/BRIDGE RELATIONSHIP SKETCH, SEE SHEET 2B-3
FOR DITCH DETAILS, SEE SHEETS 2D-1, 2D-2
FOR -L- PROFILE, SEE SHEET 23
FOR RETAINING WALL -RW99-, SEE SHEET W-1
FOR RETAINING WALL -RW100-, SEE SHEET W-2

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

7/19/2017
I-4400C_HYD_PRM_PSH_04.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-4400C	4
R/W SHEET NO.	I-4400C-4
ROADWAY DESIGN	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 5 OF 43

SITE 1 | SCN | SCK

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

2' LAT. BASE DITCH SEE DETAIL D EST. 115 TONS EST. 160 SYGF EST. 820 CY DDE

TEMP. IMPACTS IN SURFACE WATER

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL YYYY

IMPACTS IN SURFACE WATER (60" RCP)

PIPES NOT BURIED

BLIND JB
REMOVE HW

PLUG AND FLOWABLE FILL

REMOVE CB

RETAINING WALL APPROVED LINER

LEGEND

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83/NA 2011

656 657 658 659

REMOVE CB
PLUG AND FLOWABLE FILL

2GI-B
FG

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

PIPES NOT BURIED

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL EEE

PLUG AND FLOWABLE FILL

BLIND JB
REMOVE HW & 24' OF EX 60" CMP

60" RCP-IV

SITE 2 | SCL

TEMP. IMPACTS IN SURFACE WATER

TAPERED INLET W/HW – SEE SPECIAL DETAIL

IMPACTS IN SURFACE WATER (60" CMP)

TEMP. IMPACTS IN SURFACE WATER

SITE 2 | SCK

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-4400C	4
R/W SHEET NO.	I-4400C-4
ROADWAY DESIGN	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 6 OF 43

SITE 1 | SCN | SCK

2' LAT. BASE DITCH
SEE DETAIL D
EST. 115 TONS
EST. 160 SYGF
EST. 820 CY DDE

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

TEMP. IMPACTS IN SURFACE WATER

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL YYYY

IMPACTS IN SURFACE WATER (60" RCP)

PIPES NOT BURIED

BLIND JB
REMOVE HW

PLUG AND FLOWABLE FILL

REMOVE CB

RETAINING WALL APPROVED LINER

LEGEND

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83/NA 2011

656 657 658 659

REMOVE CB
PLUG AND FLOWABLE FILL

2GI-B FG

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

PIPES NOT BURIED

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL EEE

PLUG AND FLOWABLE FILL

BLIND JB
REMOVE HW & 24' OF EX 60" CMP

60" RCP-IV

SITE 2

SCL

TEMP. IMPACTS IN SURFACE WATER

TAPERED INLET W/HW – SEE SPECIAL DETAIL

IMPACTS IN SURFACE WATER (60" CMP)

TEMP. IMPACTS IN SURFACE WATER

SITE 2 | SCK

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

8/17/99

WETLAND & STREAM IMPACTS

PROJECT REFERENCE NO.	SHEET NO.
I-4400C	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 7 OF 43

LEGEND

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

MATCHLINE SHEET 18 –Y10– STA 324+00.00

MATCHLINE SHEET 4 –L– STA 664+00.00

MATCHLINE SHEET 6 –Y10RPA– STA 23+50.00

MATCHLINE SHEET 6 –L– STA 678+00.00

MATCHLINE SHEET 6 –Y10– STA 334+00.00

MATCHLINE SHEET 6 –Y10RPC_SPUR_RT– STA 10+10.00

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL YYYY

SITE 3 SCO

SITE 4 SCO

PIPE NOT BURIED

PIPE NOT BURIED

TEMP. IMPACTS IN SURFACE WATER

END RETAINING WALL –RW102– –Y10RPA SPUR RT– STA. 11+61.12, 31.29' RT

BEGIN RETAINING WALL –RW101– –L– STA. 676+00.00, 64.50' RT

END RETAINING WALL –RW100– –Y10RPB– STA. 15+00.00, 27.29' LT

PROP. WW FENCE –Y10RPB– +53, 106' LT

PROP. WW FENCE –Y10RPB– +53, 84' LT

PROP. WW FENCE –Y10RPB– +18, 84' LT

PROP. WW FENCE –Y10RPC– +96, 101' RT

PROP. WW FENCE –Y10RPC– +18, 97' RT

PROP. WW FENCE –Y10RPC– +30, 84' RT

PROP. WW FENCE –Y10RPC– +88, 135' RT

PROP. WW FENCE –Y10RPC– STA. +79, 104' RT

NOTE: TEMPORARY SHORING SHOWN FOR INFORMATION ONLY. FOR MORE INFORMATION, SEE TMP SHEETS.

WAYNE RAY NEAL

EDNA LOIS RUGGLES

EGOLF PROPERTIES, LLC

NTEINMAN JONATHAN

SALVADOR R. VASQUES, III, ET AL

WILLIAM RHETT TABER, III ANDREW PATTON TABER

JACKIE PHILIP FISHER

GLORIA D. PIERCY

VELDA LEE GOTSHAW

WILLIAM R. RICE

WILLIAM R. RICE, ET AL

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

NAD 83/NA 2011

6/14/2018
I-4400C_HYD_PRM_PSH_05.dgn
HNTR

8/17/99

WETLAND & STREAM IMPACTS

PROJECT REFERENCE NO.	SHEET NO.
I-4400C	5
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 8 OF 43

LEGEND

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

MATCHLINE SHEET 18 –Y10– STA 324+00.00

MATCHLINE SHEET 6 –Y10RPA– STA 23+50.00

MATCHLINE SHEET 6 –L– STA 678+00.00

MATCHLINE SHEET 6 –Y10– STA 334+00.00

MATCHLINE SHEET 6 –Y10RPC_SPUR_RT– STA 10+10.00

MATCHLINE SHEET 4 –L– STA 664+00.00

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL YYYY

SITE 3 SCO

SITE 4 SCO

PIPE NOT BURIED

PIPE NOT BURIED

TEMP. IMPACTS IN SURFACE WATER

END RETAINING WALL –RW102– –Y10RPA SPUR RT– STA. 11+61.12, 31.29' RT

BEGIN RETAINING WALL –RW101– –L– STA. 676+00.00, 64.50' RT

END RETAINING WALL –RW100– –Y10RPB– STA. 15+00.00, 27.29' LT

PROP. WW FENCE –Y10RPB– +53, 106' LT

PROP. WW FENCE –Y10RPB– +53, 84' LT

PROP. WW FENCE –Y10RPB– +18, 84' LT

PROP. WW FENCE –Y10RPC– +96, 101' RT

PROP. WW FENCE –Y10RPC– +18, 97' RT

PROP. WW FENCE –Y10RPC– +88, 135' RT

PROP. WW FENCE –Y10RPC– +30, 84' RT

PROP. WW FENCE –Y10RPC– STA. +79, 104' RT

NOTE:
TEMPORARY SHORING SHOWN FOR INFORMATION ONLY. FOR MORE INFORMATION, SEE TMP SHEETS.

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VELDA LEE COTSHAW

GLORIA D. PIERCY

WILLIAM R. RICE

WILLIAM R. RICE, ET AL

Y10DDI SB

Y10DDI NB

Y10RPA

Y10RPB

Y10RPC

14' FDPS

NAD 83/NA 2011

GRAPHIC SCALE 50' 0 50' 100' 150'

6/14/2018
I-4400C_HYD_PRM_PSH_05.dgn
HNTR

PROJECT REFERENCE NO.	SHEET NO.
I-4400C	5
R/W SHEET NO.	I-4400C-5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 9 OF 43

NAD 83/NA 2011

SITE 3

SCO

END RETAINING WALL –RW100–
–Y10RPB– STA. 15+00.00, 27.29' LT

CLASS 'I' RIPRAP
EST. 15 TONS
EST. 25 SYGF

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL YYYY

PIPE NOT BURIED

PLUG AND FLOWABLE FILL

RETAIN AND LINE W/APPROVED LINER

– Y10RPC

PLUG AND FLOWABLE FILL

BLIND JB

PIPE NOT BURIED

60" RCP–IV

TEMP. IMPACTS IN SURFACE WATER

TAPERED INLET W/HW – SEE SPECIAL DETAIL

WW FENCE
PC– +96, 101' RT

PRO
–Y1(

SITE 4

SCO

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

LEGEND

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

PROJECT REFERENCE NO.	SHEET NO.
I-4400C	5
RW SHEET NO.	I-4400C-5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83/NA 2011

PERMIT DRAWING
SHEET 10 OF 43

SITE 3 SCO

END RETAINING WALL –RW100–
–Y10RPB– STA. 15+00.00, 27.29' LT

CLASS 'I' RIPRAP
EST. 15 TONS
EST. 25 SYGF

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL YYYY

PIPE NOT BURIED

PLUG AND FLOWABLE FILL

RETAIN AND LINE W/APPROVED LINER

666 667

– Y10RPC

PLUG AND FLOWABLE FILL

BLIND JB

PIPE NOT BURIED

60" RCP–IV

TEMP. IMPACTS IN SURFACE WATER

TAPERED INLET W/HW – SEE SPECIAL DETAIL

WW FENCE
PC– +96, 101' RT

PRO
–Y1(

SITE 4

SCO

LEGEND

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

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

WETLAND & STREAM IMPACTS

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-4400C	6
	R/W SHEET NO.	
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 11 OF 43

LEGEND

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

NAD 83/NA 2011

MECHANIZED CLEARING IN WETLAND

FILL IN WETLAND

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

INDIRECT IMPACTS TO WETLAND (OUTSIDE RIGHT OF WAY)

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

PIPE NOT BURIED

EXCAVATION IN WETLAND

IMPACTS IN SURFACE WATER (48" WSP /RCP)

IMPACTS IN SURFACE WATER (42" & 48" RCP)

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

TEMP. IMPACTS IN SURFACE WATER

PIPE NOT BURIED

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

TEMP. IMPACTS IN SURFACE WATER

SITE 5 / SEN / WBC

SITE 5 / SCQ

SITE 6 / SCT

SITE 7 / SCQ

SITE 7 / SCR

Q2= 32.3 cfs V2= 6.2 fps Q10= 44 cfs V10= 6.7 fps

Q2= 33.5 cfs V2= 6.3 fps Q10= 45 cfs V10= 8.8 fps

2' LAT. BASE DITCH SEE DETAIL I EST. 180 TONS EST. 250 SYGF EST. 329 CY DDE

2' LAT. BASE DITCH SEE DETAIL C

2' LAT. BASE DITCH SEE DETAIL D EST. 235 TONS EST. 330 SYGF EST. 611 CY DDE

2' LAT. BASE DITCH SEE DETAIL BB EST. 2,064 CY DDE

2' SPEC. LAT. BASE DITCH SEE DETAIL V

CLASS 'I' RIPRAP EST. 35 TONS EST. 59 SYGF

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

CLASS 'B' RIPRAP EST. 10 TONS EST. 23 SYGF

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

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

36" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

24" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

15" CSP W/ USE ELBOWS – USE ROD & LUG CONNECTORS

15" CSP W/ELBOWS – USE ROD & LUG CONNECTORS

TAPERED INLET W/HW – SEE SPECIAL DETAIL

TIE 2' LAT. BASE DITCH TO –L–

BERM DITCH SEE DETAIL Z SEE SHEET 7 FOR QUANTITIES

MATCHLINE SHEET 5 –Y10RPA– STA 23+50.00

MATCHLINE SHEET 5 –L– STA 678+00.00

MATCHLINE SHEET 7 –L– STA 690+00.00

MATCHLINE SHEET 5 –Y10– STA 334+00.00

MATCHLINE SHEET 5 –Y10RPC– SPUR_RT STA 10+10.00

MATCHLINE SHEET 19 –Y10– STA 338+00.00

+00.00 –Y10RPA– 84.83' RT FOR CA FENCE

+64.62 82.54' RT FOR CA FENCE

EGOLF PROPERTIES, LLC

STUART I. RUBIN, TRUSTEE

NORTH RUGBY PROPERTIES, LLC

DISCOVERY ONE LAND HOLDING, LLC

DISCOVERY ONE LAND HOLDING, LLC

-BY3A-36 POT

-BY3A-34 PINC 10+15.78

-BY3A-35 PINC 7+89.78

-EY3A-

-RAMP D-

-Y10RPA-

-GPS24- PINC 48+10.

-RAMP C-

-Y10RPD-

-EY2-A -Y10DDI SB-

-Y10DDI NB-

-BY2-26 PINC 2+60.13

-BY4- POT 5+00.00

-Y10-

-L-

-I-26 EBL

-I-26 WBL

A

D

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

NOTE:
TEMPORARY SHORING SHOWN FOR INFORMATION ONLY. FOR MORE INFORMATION SEE TMP SHEETS.

FOR –Y10DDI_NB– and –Y10DDI_SB– ALIGNMENT DATA, SEE SHEET 2B–1
FOR CURVE DATA, SEE SHEET 2B–2
FOR –Y10DDI (NORTH)– INTERSECTION DETAILS, SEE SHEET 2B–6
FOR –Y10DDI (SOUTH)– INTERSECTION DETAILS, SEE SHEET 2B–7
FOR –Y10– PAVEMENT/BRIDGE RELATIONSHIP SKETCH, SEE SHEET 2B–3
FOR DITCH DETAIL, SEE SHEETS 2D–1, 2D–2

FOR –Y10– PROFILE, SEE SHEET 36
FOR –Y10RPA– PROFILE, SEE SHEET 38
FOR –Y10RPD– PROFILE, SEE SHEET 43
FOR – L – PROFILE, SEE SHEET 25
FOR RETAINING WALL –RW102–, SEE SHEET W–4

7/19/2017
7/19/2017
I-4400C_HYD_PRM_PSH_06.dgn
HNTB

WETLAND & STREAM IMPACTS

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-4400C	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 12 OF 43

LEGEND

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

NAD 83/NA 2011

MECHANIZED CLEARING IN WETLAND

FILL IN WETLAND

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

INDIRECT IMPACTS TO WETLAND (OUTSIDE RIGHT OF WAY)

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

PIPE NOT BURIED

IMPACTS IN SURFACE WATER (48" WSP /RCP)

EXCAVATION IN WETLAND

IMPACTS IN SURFACE WATER (42" & 48" RCP)

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

TEMP. IMPACTS IN SURFACE WATER

PIPE NOT BURIED

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

TEMP. IMPACTS IN SURFACE WATER

SITE 5 / SEN / WBC

SITE 5 / SCQ

SITE 6 / SCT

SITE 7 / SCQ

SITE 7 / SCR

Q2= 32.3 cfs
V2= 6.2 fps
Q10= 44 cfs
V10= 6.7 fps

Q2= 33.5 cfs
V2= 6.3 fps
Q10= 45 cfs
V10= 8.8 fps

2' LAT. BASE DITCH SEE DETAIL C

2' LAT. BASE DITCH SEE DETAIL I EST. 180 TONS EST. 250 SYGF EST. 329 CY DDE

CLASS 'I' RIPRAP EST. 35 TONS EST. 59 SYGF

36" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

2' LAT. BASE DITCH SEE DETAIL D EST. 235 TONS EST. 330 SYGF EST. 611 CY DDE

CLASS 'B' RIPRAP EST. 35 TONS EST. 14 SYGF

TIE 2' LAT. BASE DITCH TO –L–

24" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

CLASS 'B' RIPRAP EST. 10 TONS EST. 23 SYGF

15" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

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

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

2' LAT. BASE DITCH SEE DETAIL BB EST. 2,064 CY DDE

15" CSP W/ELBOWS – USE ROD & LUG CONNECTORS

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

2' SPEC. LAT. BASE DITCH SEE DETAIL V

BERM DITCH SEE DETAIL Z SEE SHEET 7 FOR QUANTITIES

TAPERED INLET W/HW – SEE SPECIAL DETAIL

REMOVE HW & 27' OF EX 48" CMP

REMOVE HW & 44' OF EX 48" CMP

RETAIN AND LINE W/APPROVED LINER

PIPE COLLAR

BLIND JB

PLUG AND FLOWABLE FILL

REMOVE

RETAIN

MATCHLINE SHEET 5 –Y10RPA– STA 23+50.00

MATCHLINE SHEET 5 –L– STA 678+00.00

MATCHLINE SHEET 5 –Y10– STA 334+00.00

MATCHLINE SHEET 5 –Y10RPC– SPUR_RT STA 10+10.00

MATCHLINE SHEET 19 –Y10– STA 338+00.00

MATCHLINE SHEET 7 –L– STA 690+00.00

+00.00 –Y10RPA– 84.83' RT FOR CA FENCE

+64.62 82.54' RT FOR CA FENCE

EGOLF PROPERTIES, LLC

STUART J. RUBIN, TRUSTEE

NORTH RUGBY PROPERTIES, LLC

DISCOVERY ONE LAND HOLDING, LLC

DISCOVERY ONE LAND HOLDING, LLC

RAMP D

RAMP C

–Y10RPA–

–Y10RPD–

–Y10DDI SB–

–Y10DDI NB–

–Y10–

–L–

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

NOTE:
TEMPORARY SHORING SHOWN FOR INFORMATION ONLY. FOR MORE INFORMATION SEE TMP SHEETS.

FOR –Y10DDI_NB– and –Y10DDI_SB– ALIGNMENT DATA, SEE SHEET 2B–1
FOR CURVE DATA, SEE SHEET 2B–2
FOR –Y10DDI (NORTH)– INTERSECTION DETAILS, SEE SHEET 2B–6
FOR –Y10DDI (SOUTH)– INTERSECTION DETAILS, SEE SHEET 2B–7
FOR –Y10– PAVEMENT/BRIDGE RELATIONSHIP SKETCH, SEE SHEET 2B–3
FOR DITCH DETAIL, SEE SHEETS 2D–1, 2D–2

FOR –Y10– PROFILE, SEE SHEET 36
FOR –Y10RPA– PROFILE, SEE SHEET 38
FOR –Y10RPD– PROFILE, SEE SHEET 43
FOR – L – PROFILE, SEE SHEET 25
FOR RETAINING WALL –RW102–, SEE SHEET W–4

7/19/2017
I-4400C_HYD_PRM_PSH_06.dgn
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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-4400C	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 13 OF 43

SITE 5

SEN | SCQ | WBC

INDIRECT IMPACTS TO WETLAND (OUTSIDE RIGHT OF WAY)

MECHANIZED CLEARING IN WETLAND

INDIRECT IMPACTS TO WETLAND (OUTSIDE RIGHT OF WAY)

EXCAVATION IN WETLAND

FILL IN WETLAND

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

15" RCP–IV

48" RCP–IV

PIPE NOT BURIED

REMOVE HW & 44' OF EX 48" CMP

36" RCP–IV

PLUG AND FLOWABLE FILL

BLIND JB

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

24" RCP–IV

PLUG AND FLOWABLE FILL

REMOVE DI 683

684

685

RETAIN AND LINE W/APPROVED LINER

REMOVE

24" RCP–IV

REMOVE

18" RCP–IV

24" RCP–IV

15" RCP–IV

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

LEGEND

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

NAD 83/NA 2011

50' 0' 50' 100' 150'

GRAPHIC SCALE

IMPACTS IN SURFACE WATER (42" & 48" RCP)

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

BLIND JB

25 – Y10RPD – 23 22

48" RCP–IV

BLIND JB

48" RCP–IV

PIPE NOT BURIED

TAPERED INLET W/HW – SEE SPECIAL DETAIL

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

TEMP. IMPACTS IN SURFACE WATER

SITE 7

SCR

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PROJECT REFERENCE NO.	SHEET NO.
I-4400C	6
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 14 OF 43

SITE 5

SEN | SCQ | WBC

INDIRECT IMPACTS TO WETLAND (OUTSIDE RIGHT OF WAY)

MECHANIZED CLEARING IN WETLAND

INDIRECT IMPACTS TO WETLAND (OUTSIDE RIGHT OF WAY)

EXCAVATION IN WETLAND

FILL IN WETLAND

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

15" RCP–IV

48" RCP–IV

PIPE NOT BURIED

REMOVE HW & 44' OF EX 48" CMP

36" RCP–IV

PLUG AND FLOWABLE FILL

BLIND JB

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

24" RCP–IV

PLUG AND FLOWABLE FILL

REMOVE DI 683

684

685

REMOVE

RETAIN AND LINE W/APPROVED LINER

REMOVE

24" RCP–IV

REMOVE

18" RCP–IV

24" RCP–IV

15" RCP–IV

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

LEGEND

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

NAD 83/NA 2011

50' 0' 50' 100' 150'

GRAPHIC SCALE

IMPACTS IN SURFACE WATER (42" & 48" RCP)

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

BLIND JB

25 – Y10RPD – 23 22

48" RCP–IV

BLIND JB

48" RCP–IV

SITE 7

SCR

TEMP. IMPACTS IN SURFACE WATER

TAPERED INLET W/HW – SEE SPECIAL DETAIL

PIPE NOT BURIED

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

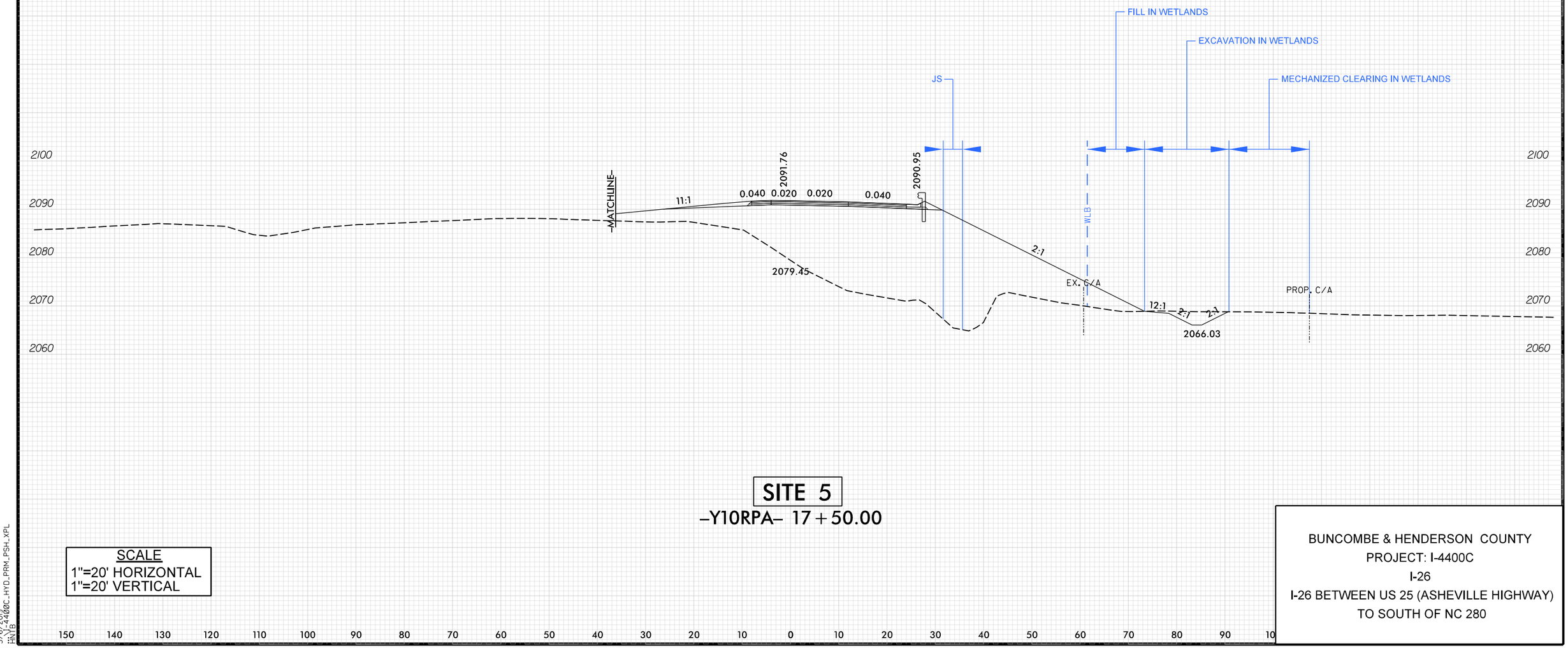
TEMP. IMPACTS IN SURFACE WATER

6/23/16

PROJ. REFERENCE NO.	SHEET NO.
I-4700	

PERMIT DRAWING
SHEET 15 OF 43

WETLAND CROSS SECTIONS



SITE 5

–Y10RPA– 17+50.00

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

BUNCOMBE & HENDERSON COUNTY
PROJECT: I-4400C
I-26
I-26 BETWEEN US 25 (ASHEVILLE HIGHWAY)
TO SOUTH OF NC 280

3/6/2019
I-4400C_HYD_PRM_PSH_XPL
HNTB

7/19/2017

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Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4400C	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 16 OF 43

WETLAND & STREAM IMPACTS

LEGEND

DENOTES IMPACTS IN SURFACE WATER

NAD 83/NA 2011

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

SITE 6

SCT

MATCHLINE SHEET 6 –L– STA 690+00.00

MATCHLINE SHEET 8 –L– STA 704+00.00

2' LAT. BASE DITCH SEE DETAIL D SEE SHEET 6 FOR DITCH QUANTITIES

TIE PROP. TYPICAL CUT DITCH TO PROP. 2' LAT. BASE DITCH

PLUG AND FLOWABLE FILL

REMOVE DI

36" RCP-IV

FLOWABLE FILL

2GI-A FG

30" RCP-IV

15" RCP-IV

2GI-B FG

18" RCP-IV

REMOVE 45' OF EX 30" CMP

REMOVE

REMOVE HW

2GI-B SG

FS-3

30" RCP-IV

REMOVE DI

RETAIN

RETAIN (ALL DROP INLETS IN THIS SYSTEM)

DROP INLETS BOLTED 4" PVC BETWEEN EACH

24" HDPE

18" HDPE

18" C&G

48" CHL

30" BST

2' SPEC. LAT. BASE DITCH SEE DETAIL V

BERM DITCH SEE DETAIL Z EST. 410 SY CFM

BERM DITCH SEE DETAIL Y

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

15" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

BDO

FLOWABLE FILL

CAMPING WORLD

BST CAMPER PARKING

NORTH RUGBY PROPERTIES, LLC

DISCOVERY ONE LAND HOLDING, LLC

EDWARD H. OWENBEY

TINA M. CORN

WENDELL L. WILKIE

JAMES E. HANNEN

DEBORAH CEE HENDERSON

PATRICK J. STEVENS

MACK D. FRANKLIN

ADMIRAL D. WILLIAMS, TRUSTEE THE WILLIAMS FAMILY TRUST

CMH HOMES, INC.

FLEETWOOD AVE

Y10RPD

I-26 EBL

I-26 WBL

FOR –Y10RPA– PROFILE, SEE SHEET 38
FOR –EBL– PROFILE, SEE SHEET 25 & 26
FOR – WBL– PROFILE, SEE SHEET 25 & 26

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

3/4/2019
I-4400C_HYD_PRM_PSH_07.dgn
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WETLAND & STREAM IMPACTS

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PROJECT REFERENCE NO.	SHEET NO.
I-4400C	7
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 17 OF 43

LEGEND

DENOTES IMPACTS IN SURFACE WATER

NAD 83/NA 2011

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

SITE 6

SCT

MATCHLINE SHEET 6 –L– STA 690+00.00

MATCHLINE SHEET 8 –L– STA 704+00.00

2' LAT. BASE DITCH SEE DETAIL D SEE SHEET 6 FOR DITCH QUANTITIES

TIE PROP. TYPICAL CUT DITCH TO PROP. 2' LAT. BASE DITCH

PLUG AND FLOWABLE FILL

REMOVE DI

36" RCP-IV

FLOWABLE FILL

30" RCP-IV

15" RCP-IV

18" RCP-IV

REMOVE

REMOVE 45° OF EX 30" CMP

REMOVE HW

2GI-A FG

2GI-B FG

2GI-B SG

FS-3

2' SPEC. LAT. BASE DITCH SEE DETAIL V

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

15" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

BERM DITCH SEE DETAIL Z EST. 410 SY CFM

BERM DITCH SEE DETAIL Y

BDO

RETAIN

RETAIN (ALL DROP INLETS IN THIS SYSTEM)

24" HDPE

18" HDPE

18" C&G

30" BST

DROP INLETS BOLTED 4" PVC BETWEEN EACH

CAMPING WORLD

NORTH RUGBY PROPERTIES, LLC

BST CAMPER PARKING

DISCOVERY ONE LAND HOLDING, LLC

EDWARD H. OWENBEY

TINA M. CORN

WENDELL L. WILKIE

JAMES E. HANNEN

DEBORAH CEE HENDERSON

PATRICK J. STEVENS

MACK D. FRANKLIN

CMH HOMES, INC.

ADMIRAL D. WILLIAMS, TRUSTEE THE WILLIAMS FAMILY TRUST

FLEETWOOD AVE

Y10RPD

–L–

–EBL–

–WBL–

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

FOR –Y10RPA– PROFILE, SEE SHEET 38
FOR –EBL– PROFILE, SEE SHEET 25 & 26
FOR – WBL– PROFILE, SEE SHEET 25 & 26

3/4/2019
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WETLAND & STREAM IMPACTS

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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-4400C	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83/NA 2011

PERMIT DRAWING SHEET 18 OF 43

LEGEND

- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING

ASHEVILLE KOREAN BAPTIST CHURCH
WALTER MILLS
CHARLES O. HAMPTON, JR.
OLIVIA McMINN
NORTH RUGBY PROPERTIES, LLC
NORTH CAROLINA DEPT. OF TRANS.
WOLFE PROPERTY HOLDINGS, LLC
CHANCELLOR MEDIA WHITECO OUTDOOR CORP.
MORTON BUILDINGS, INC.
CMH HOMES, INC.
JAMES E. HANNEN
JOHN T. VORYS
FLETCHER AUTOBODY, LLC
ROCKWELL HEAVY VEHICLE SYSTEMS, INC.

ROW FOR FIRST CLAIM (0.0976 AC)
ROW FOR FIRST CLAIM (0.0168 AC)
DO NOT DISTURB BILLBOARD
DO NOT DISTURB MANHOLE
+15.00 -L- 135.00' LT 125.00' LT FOR CA FENCE

RETAIN
CB-F
15" RCP-IV
CB-G
15" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS
CLASS 'B' RIPRAP EST. 8 TONS EST. 16 SYGF
CLASS 'B' RIPRAP EST. 2 TONS EST. 7 SYGF
CLASS 'B' RIPRAP EST. 5 TONS EST. 11 SYGF
REMOVE
2' LAT. BASE DITCH SEE DETAIL C
2' LAT. BASE DITCH SEE DETAIL JJ
2' LAT. BASE DITCH SEE DETAIL J EST. 2,240 CY DDE
CLASS 'B' RIPRAP EST. 2 TONS EST. 7 SYGF
50:1 FDPS TRANSITION FROM 11'-8" AT -L- STA. 711+00 TO 12'-0" AT -L- STA. 711+17
BEGIN SHOULDER BERM GUTTER +00.00 -L-
25:1 FDPS TRANSITIONS FROM 12'-0" AT STA. 714+05 TO 12'-0" AT STA. 714+30
25:1 FDPS TRANSITIONS FROM 12'-0" AT STA. 713+70 TO 11'-0" AT STA. 713+95
2GI-B FG
TB2GI-A FG
TB2GI-B FG
REMOVE DI
24" RCP-IV
18" RCP-IV 2GI-B SG
FS-3
CLASS 'B' RIPRAP EST. 15 TONS EST. 33 SYGF
PLUG AND FLOWABLE FILL
REMOVE 5' OF EX 15" RCP
REMOVE 11' OF EX 15" RCP
2' LAT. BASE DITCH SEE DETAIL II EST. 1,422 CY DDE
TIE PROP. 2' LAT. BASE DITCH TO EXIST. WETLAND
CLASS 'B' RIPRAP EST. 10 TONS, EST. 22 SYGF
2' LAT. BASE DITCH SEE DETAIL GG
FILL IN WETLAND
MECHANIZED CLEARING IN WETLAND
SITE 8
WBG

MATCHLINE SHEET 7 –L– STA 704+00.00

MATCHLINE SHEET 9 –L– STA 718+00.00

MATCHLINE SHEET 20 –Y11– STA STA 19+50.00

★ PROPOSED TRAFFIC SIGNAL

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

NOTE:
TEMPORARY SHORING SHOWN FOR INFORMATION ONLY. FOR MORE INFORMATION SEE TMP SHEETS.

6/14/2019
I-4400C_HYD_PRM_PSH_08.dgn
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7/19/2017

WETLAND & STREAM IMPACTS

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-4400C	8
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 19 OF 43

NAD 83/NA 2011

LEGEND

- DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING

ASHEVILLE KOREAN BAPTIST CHURCH
WALTER MILLS
CHARLES O. HAMPTON, JR.
OLIVIA McMINN
NORTH RUGBY PROPERTIES, LLC
NORTH CAROLINA DEPT. OF TRANS.
ROW FOR FIRST CLAIM (0.0976 AC)
ROW FOR FIRST CLAIM (0.0168 AC)
CHANCELLOR MEDIA WHITECOM OUTDOOR CORP.
DO NOT DISTURB BILLBOARD
WOLFE PROPERTY HOLDINGS, LLC
DO NOT DISTURB MANHOLE
MORTON BUILDINGS, INC.
CMH HOMES, INC.
JAMES E. HANNEN
JOHN T. VORYS
FLETCHER AUTOBODY, LLC
ROCKWELL HEAVY VEHICLE SYSTEMS, INC.

MATCHLINE SHEET 7 –L– STA 704+00.00

MATCHLINE SHEET 9 –L– STA 718+00.00

MATCHLINE SHEET 20 –Y11– STA STA 19+50.00

+15.00 –L– 135.00' LT 125.00' LT FOR CA FENCE

CLASS 'B' RIPRAP EST. 8 TONS EST. 16 SYGF

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

CLASS 'B' RIPRAP EST. 5 TONS EST. 11 SYGF

CLASS 'B' RIPRAP EST. 15 TONS EST. 33 SYGF

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

CLASS 'B' RIPRAP EST. 10 TONS, EST. 22 SYGF

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

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

CLASS 'B' RIPRAP EST. 2,240 CY DDE

15" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

2' LAT. BASE DITCH SEE DETAIL C

2' LAT. BASE DITCH SEE DETAIL JJ

2' LAT. BASE DITCH SEE DETAIL II EST. 1,422 CY DDE

2' LAT. BASE DITCH SEE DETAIL GG

50:1 FDPS TRANSITION FROM 11'-8" AT –L– STA. 711+00 TO 12'-0" AT –L– STA. 711+17

BEGIN SHOULDER BERM GUTTER +00.00 –L–

25:1 FDPS TRANSITIONS FROM 11'-0" AT STA. 714+05 TO 12'-0" AT STA. 714+30

25:1 FDPS TRANSITIONS FROM 12'-0" AT STA. 713+70 TO 11'-0" AT STA. 713+95

TIE PROP. 2' LAT. BASE DITCH TO EXIST. WETLAND

FILL IN WETLAND

MECHANIZED CLEARING IN WETLAND

SITE 8

WBG

★ PROPOSED TRAFFIC SIGNAL

NOTE:
TEMPORARY SHORING SHOWN FOR INFORMATION ONLY. FOR MORE INFORMATION SEE TMP SHEETS.

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

6/14/2019
I-4400C_HYD_PRM_PSH_08.dgn
HNTB

7/19/2017

WETLAND & STREAM IMPACTS

HNTB NORTH CAROLINA, P.C.
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NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4400C	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 20 OF 43

NAD 83/NA 2011

LEGEND

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

MATCHLINE SHEET 8
–L– STA 718+00.00

MATCHLINE SHEET 10
–L– STA 732+00.00

-BL-8 PINC 86+26.35

-BL-9 PINC 96+53.60

MARY LOUISE CORN, ET AL

LORA J. HOLCOMBE

JUDY JONES

ISMTLBUS

ROCKWELL HEAVY VEHICLE SYSTEMS, INC.

SITE 9

SCU

SITE 8

SCU

WBG

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL YYYY

IMPACTS IN SURFACE WATER (36" RCP)

TEMP. IMPACTS IN SURFACE WATER

FILL IN WETLAND

PIPES NOT BURIED

PIPES NOT BURIED

MECHANIZED CLEARING IN WETLAND

IMPACTS IN SURFACE WATER (36" RCP)

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

2' LAT. BASE DITCH SEE DETAIL J

2' LAT. BASE DITCH SEE DETAIL II

2' LAT. BASE DITCH SEE DETAIL LL

2' LAT. BASE DITCH SEE DETAIL JJ EST. 197 CY DDE

2' LAT. BASE DITCH SEE DETAIL II EST. 1,429 CY DDE

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

CLASS 'B' RIPRAP EST. 3 TONS EST. 5 SYGF

CLASS 'B' RIPRAP EST. 1 TONS EST. 8 SYGF

15" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

36" WELDED STEEL PIPE 0.500" WALL THICKNESS TRENCHLESS INSTALLATION

36" RCP-IV

15" RCP-IV

2GI-B FG

TB2GI-B FG

REMOVE DI

REMOVE

PLUG AND FLOWABLE FILL

REMOVE 5' OF EX 15" RCP

REMOVE 8' OF EX 15" RCP

BLIND JB

REMOVE HW

RETAIN AND LINE W/APPROVED LINER

FGEL (ELEV. 2088.0) UPSTREAM CULVERT CHANNEL IMPROVEMENTS WITH FLOODPLAIN BENCH SEE DETAIL FFF

Q2= 1.4 cfs
V2= 0.6 fps
Q10= 1.8 cfs
V10= 0.7 fps

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

FOR CURVE DATA, SEE SHEET 2B–2
FOR DITCH DETAIL, SEE SHEETS 2D–1, 2D–2
FOR –L– PROFILE, SEE SHEET 27 & 28

6/14/2019
I-4400C_HYD_PRM_PSH_09.dgn
HNTB

7/19/2017

WETLAND & STREAM IMPACTS

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Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4400C	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 21 OF 43

NAD 83/NA 2011

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

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL YYYY

IMPACTS IN SURFACE WATER (36" RCP)

TEMP. IMPACTS IN SURFACE WATER

FILL IN WETLAND

SITE 9
SCU

MATCHLINE SHEET 8 –L– STA 718+00.00

MATCHLINE SHEET 10 –L– STA 732+00.00

-BL-8 PINC 86+26.35

-BL-9 PINC 96+53.60

MARY LOUISE CORN, ET AL

LORA J. HOLCOMBE

JUDY JONES

ISMTLBUS

2' LAT. BASE DITCH SEE DETAIL J

2' LAT. BASE DITCH SEE DETAIL II

2' LAT. BASE DITCH SEE DETAIL LL

2' LAT. BASE DITCH SEE DETAIL JJ EST. 197 CY DDE

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

CLASS 'B' RIPRAP EST. 1 TONS EST. 8 SYGF

15" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

48" WW & ISBW

2GI-B FG

15" RCP-IV

TB2GI-B FG

REMOVE DI

REMOVE

REMOVE 5' OF EX 15" RCP

PLUG AND FLOWABLE FILL

36" RCP-IV

BLIND JB

36" WELDED STEEL PIPE 0.500" WALL THICKNESS TRENCHLESS INSTALLATION

PIPES NOT BURIED

RETAIN AND LINE W/APPROVED LINER

REMOVE HW 2GI-B FG

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

CLASS 'B' RIPRAP EST. 3 TONS EST. 5 SYGF

FOCA (ELEV. 2088.0) UPSTREAM CULVERT CHANNEL IMPROVEMENTS WITH FLOODPLAIN BENCH SEE DETAIL FFF

Q2= 1.4 cfs
V2= 0.6 fps
Q10= 1.8 cfs
V10= 0.7 fps

SITE 8
SCU
WBG

MECHANIZED CLEARING IN WETLAND

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

IMPACTS IN SURFACE WATER (36" RCP)

ROCKWELL HEAVY VEHICLE SYSTEMS, INC.

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

FOR CURVE DATA, SEE SHEET 2B-2
FOR DITCH DETAIL, SEE SHEETS 2D-1, 2D-2
FOR –L– PROFILE, SEE SHEET 27 & 28

6/14/2019
I-4400C_HYD_PRM_PSH_09.dgn
HNTB

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-4400C	9
		R/W SHEET NO.	
		ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

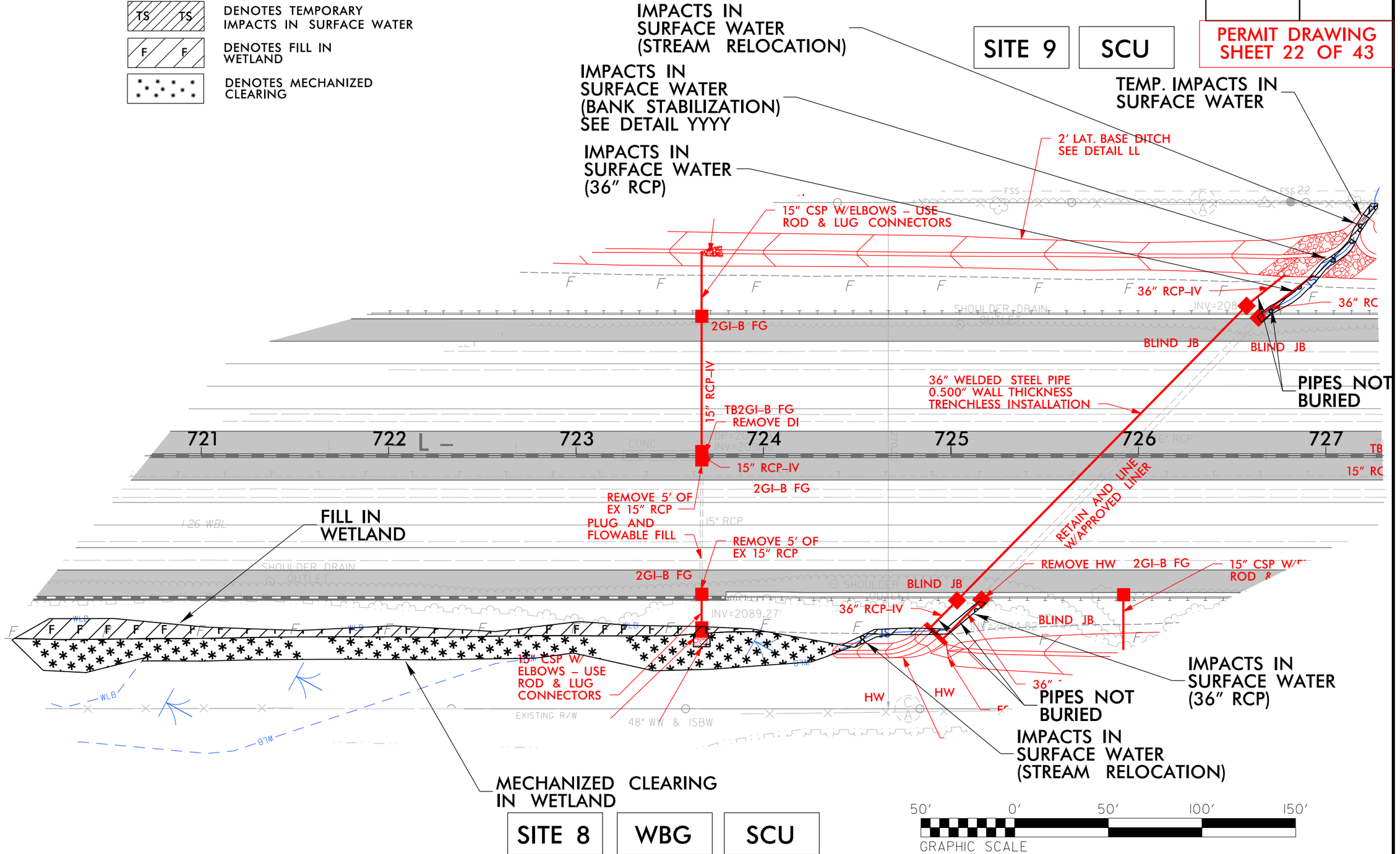
WETLAND & STREAM IMPACTS

LEGEND

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

PERMIT DRAWING SHEET 22 OF 43

SITE 9 | SCU



SITE 8 | WBG | SCU

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-4400C	9
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

WETLAND & STREAM IMPACTS

LEGEND

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

PERMIT DRAWING SHEET 23 OF 43

SITE 9 | **SCU**

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL YYYY

IMPACTS IN SURFACE WATER (36" RCP)

TEMP. IMPACTS IN SURFACE WATER

2' LAT. BASE DITCH SEE DETAIL LL

15" CSP W/ELBOWS – USE ROD & LUG CONNECTORS

36" RCP–IV

36" RC

2GI–B FG

BLIND JB

BLIND JB

PIPES NOT BURIED

36" WELDED STEEL PIPE 0.500" WALL THICKNESS TRENCHLESS INSTALLATION

721 722 723 724 725 726 727

15" RCP–IV

TB2GI–B FG REMOVE DI

2GI–B FG

REMOVE 5' OF EX 15" RCP PLUG AND FLOWABLE FILL

REMOVE 5' OF EX 15" RCP

RETAIN AND LINE W/APPROVED LINER

FILL IN WETLAND

SHOULDER DRAIN OUTLET

REMOVE HW

2GI–B FG

15" CSP W/E ROD &

BLIND JB

36" RCP–IV

BLIND JB

15" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

HW

HW

36"

PIPES NOT BURIED

IMPACTS IN SURFACE WATER (36" RCP)

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

EXISTING R/W

48" WW & ISBW

MECHANIZED CLEARING IN WETLAND

SITE 8 | **WBG** | **SCU**

50' 0' 50' 100' 150'

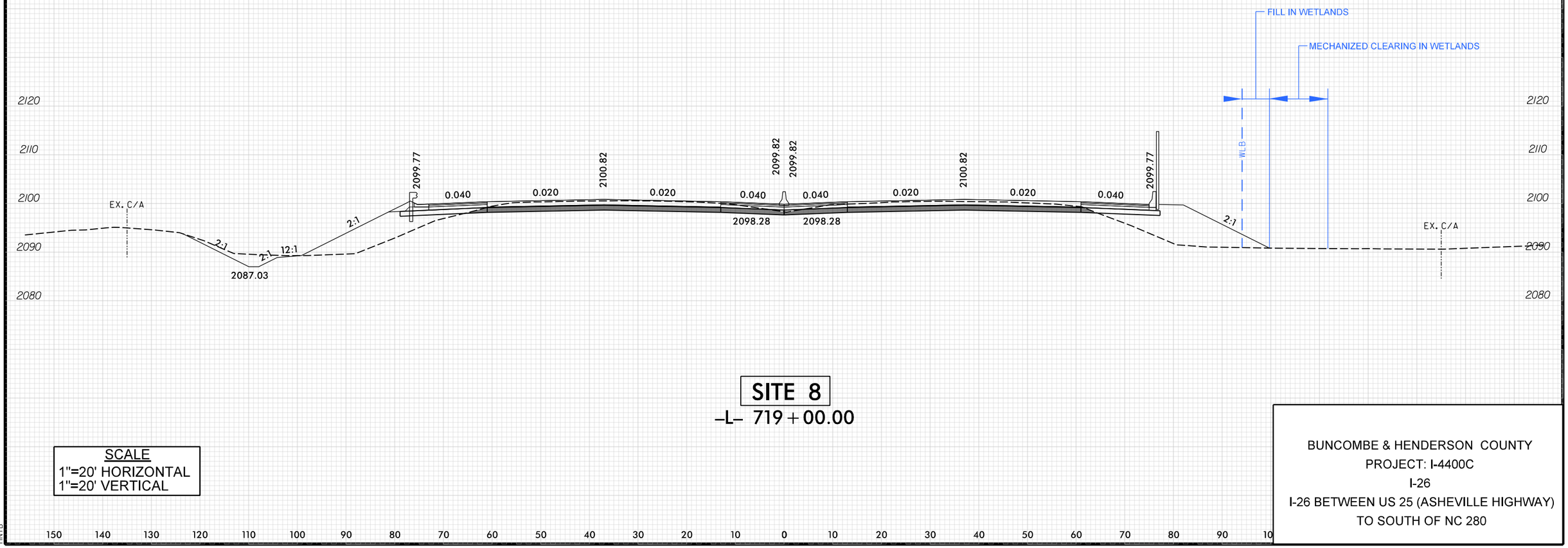
GRAPHIC SCALE

6/23/16

PROJ. REFERENCE NO.	SHEET NO.
I-4700	

PERMIT DRAWING
SHEET 24 OF 43

WETLAND CROSS SECTIONS



SITE 8
–L– 719+00.00

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

BUNCOMBE & HENDERSON COUNTY
PROJECT: I-4400C
I-26
I-26 BETWEEN US 25 (ASHEVILLE HIGHWAY)
TO SOUTH OF NC 280

3/6/2019
I-4400C_HYD_PRM_PSH_XPL
HNTB

7/19/2017

WETLAND & STREAM IMPACTS

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-4400C	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 25 OF 43

NAD 83/NA 2011

MATCHLINE SHEET 10
–L– STA 746+00.00

MATCHLINE SHEET 12
–L– STA 760+00.00

Q2= 3.9 cfs
V2= 0.9 fps
Q10= 5.3 cfs
V10= 1.0 fps

SITE 10
WBI

SITE 11
SCX

SITE 12
CANE CREEK

MECHANIZED CLEARING IN WETLAND (25)
BIG J. SMALL J. PARTNERSHIP

WARRIOR GOLF MANAGEMENT, LLC

RUGBY GRANGE FARMS, LLC

ROCKWELL HEAVY VEHICLE SYSTEMS, INC. (24)

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE PERMIT DRAWING SHEET 27 OF 43

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE PERMIT DRAWING SHEET 27 OF 43

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL YY

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

2' LAT. BASE DITCH SEE DETAIL O SEE SHEET 10 FOR QUANTITIES

TIE 2' LAT. BASE DITCH INTO EDGE OF WETLAND

CLASS 'B' RIPRAP EST. 3 TONS EST. 5 SYGF

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

15" CSP W/ELBOWS – USE ROD & LUG CONNECTORS

24" CSP W/ELBOWS – USE ROD & LUG CONNECTORS

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

BANK STABILIZATION SEE DETAIL YY EST. 153 TONS

PLUG AND FLOWABLE FILL

REMOVE 15" CMP

REMOVE 24" RCP-IV

REMOVE DI

REMOVE CB

PROPOSED BRIDGE BENTS

2' LAT. BASE DITCH SEE DETAIL BB

15" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

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

TIE EXIST. STREAM TO PROP. 7' LATERAL BASE DITCH

7' LAT. BASE DITCH SEE DETAIL M EST. 4,467 CY DDE

BANK STABILIZATION SEE DETAIL YY EST. 74 TONS

CHANNEL CHANGE SEE DETAIL L EST. 207 TONS EST. 209 SYGF

BANK STABILIZATION SEE DETAIL ZZ

BANK STABILIZATION SEE DETAIL YY EST. 134 TONS

NOTE:
TEMPORARY SHORING SHOWN FOR INFORMATION ONLY. FOR MORE INFORMATION SEE TMP SHEETS.

FOR CURVE DATA, SEE SHEET 2B–2
FOR CANE CREEK PAVEMENT/BRIDGE RELATIONSHIP SKETCH, SEE SHEET 2B–3
FOR DITCH DETAIL, SEE SHEETS 2D–1, 2D–2
FOR –L– PROFILE, SEE SHEET 29 & 30

7/12/2019
I-4400C_HYD_PRM_PSH_11.dgn
HNTB

7/19/2017

WETLAND & STREAM IMPACTS

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-4400C	11
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 26 OF 43

NAD 83/NA 2011

MATCHLINE –L– STA 746+00.00
SEE SHEET 10

MATCHLINE –L– STA 760+00.00
SEE SHEET 12

Q2= 3.9 cfs
V2= 0.9 fps
Q10= 5.3 cfs
V10= 1.0 fps

2' LAT. BASE DITCH SEE DETAIL O SEE SHEET 10 FOR QUANTITIES

TIE 2' LAT. BASE DITCH INTO EDGE OF WETLAND

SITE 10

WBI

CLASS 'B' RIPRAP EST. 3 TONS EST. 5 SYGF

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

MECHANIZED CLEARING IN WETLAND (25)

BIG J. SMALL J. PARTNERSHIP

15" CSP W/ELBOWS – USE ROD & LUG CONNECTORS

2GI-B FG

REMOVE 15" CMP

TB2GI-B FG

15" RCP-IV

REMOVE

2' LAT. BASE DITCH SEE DETAIL BB

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

7' LAT. BASE DITCH SEE DETAIL M EST. 4,467 CY DDE

TIE EXIST. STREAM TO PROP. 7' LATERAL BASE DITCH

BANK STABILIZATION SEE DETAIL YY EST. 74 TONS

SITE 11

SCX

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL YY

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

ROCKWELL HEAVY VEHICLE SYSTEMS, INC. (24)

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

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

24" CSP W/ELBOWS – USE ROD & LUG CONNECTORS

PLUG AND FLOWABLE FILL

24" RCP-IV

REMOVE DI

A/G SEWER LINE ABANDONED

15" CSP W/ELBOWS – USE ROD & LUG CONNECTORS

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

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

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

BANK STABILIZATION SEE DETAIL YY EST. 153 TONS

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE PERMIT DRAWING SHEET 27 OF 43

WARRIOR GOLF MANAGEMENT, LLC

CANE CREEK

PROPOSED BRIDGE BENTS

REMOVE CB

BANK STABILIZATION SEE DETAIL ZZ

BANK STABILIZATION SEE DETAIL YY EST. 134 TONS

CHANNEL CHANGE SEE DETAIL L EST. 207 TONS EST. 209 SYGF

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE PERMIT DRAWING SHEET 27 OF 43

SITE 12

CANE CREEK

RUGBY GRANGE FARMS, LLC

NOTE:
TEMPORARY SHORING SHOWN FOR INFORMATION ONLY. FOR MORE INFORMATION SEE TMP SHEETS.

FOR CURVE DATA, SEE SHEET 2B–2
FOR CANE CREEK PAVEMENT/BRIDGE RELATIONSHIP SKETCH, SEE SHEET 2B–3
FOR DITCH DETAIL, SEE SHEETS 2D–1, 2D–2
FOR –L– PROFILE, SEE SHEET 29 & 30

7/12/2018
I-4400C_HYD_PRM_PSH_11.dgn
HNTB

6/23/16

PROJ. REFERENCE NO.	SHEET NO.
I-4700	

PERMIT DRAWING
SHEET 27 OF 43

753+00 754+00 755+00 756+00 757+00 758+00

℄ BRIDGE STA. = 756+21.00 –L–
1 @ 66'–3", 1 @ 110'–0", 1 @ 66'–3" WITH RC DECK ON 63" PRESTRESSED CONCRETE GIRDERS
SKEW = 90°
GRADE POINT ELEV. = 2069.99'

HISTORICAL HW = 2072.0'
05–28–1973

BEGIN BRIDGE
–L– 754+98.00

END BRIDGE
–L– 757+44.00

PROFILE GRADE LINE (PGL)

(+)0.3200%

(–)0.7067%

EXISTING ROADWAY

LOWEST LOW CHORD

Q_{100} EL. = 2061.0'

Q_{50} EL. = 2060.1'

EXISTING BRIDGE

OT STA. = 753+28.89
OT ELEV. = 2069.2'
PGL @ SAG

WS EL. = 2046.7'
SURVEY 01–22–18

NATURAL GROUND (LT)

1.5:1 SLOPE (TYP.)
NORMAL TO CAP
CLASS "II" RIP RAP (TYP)

EXCAVATE TO 2055.0'

NATURAL GROUND (RT)

3'–6" (TYP)

BENCH LOWERED TO ACCOMODATE FUTURE GREENWAY PATH.
EXCAVATE TO EL. = 2053.5'

THEORETICAL 100–YR & 500–YR SCOUR
BED MATERIAL = SAND & SILT

RIPRAP AT EMBANKMENT
CLASS "II" RIP RAP (TYP).
IF EXISTING SLOPE IS <1.
THEN GRADE SLOPE TO
EXISTING GROUND

2070 2060 2050 2040 2030

PROFILE

BUNCOMBE & HENDERSON COUNTY
PROJECT: I-4400C
I-26
I-26 BETWEEN US 25 (ASHEVILLE HIGHWAY)
TO SOUTH OF NC 280

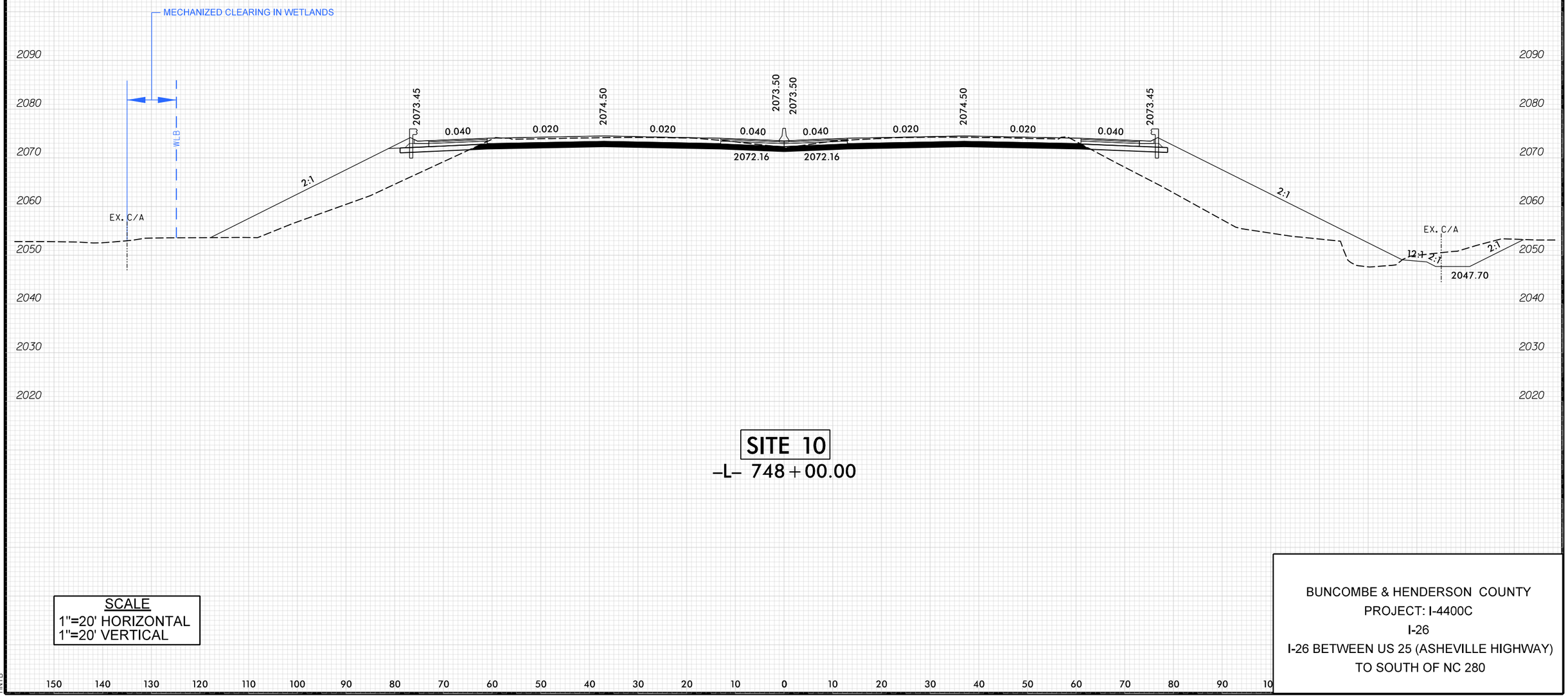
3/4/2019
I-4400C_HYD_PRM_PSH_11A_BDG_PFL.dgn
HNB

6/23/16

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

PERMIT DRAWING
SHEET 28 OF 43

WETLAND CROSS SECTIONS



SITE 10
–L– 748+00.00

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

BUNCOMBE & HENDERSON COUNTY
PROJECT: I-4400C
I-26
I-26 BETWEEN US 25 (ASHEVILLE HIGHWAY)
TO SOUTH OF NC 280

3/6/2019
I-4400C_HYD_PRM_PSH_XPL
HNTB

7/19/2017

WETLAND & STREAM IMPACTS

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-4400C	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 29 OF 43

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

NAD 83/NA 2011

MATCHLINE SHEET 11
–L– STA 760+00.00

MATCHLINE SHEET 13
–L– STA 774+00.00

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL CCC

FILL IN WETLAND

SITE 13
SCZ
WBL

SITE 14
SCY

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL BBB

IMPACTS IN SURFACE WATER (3 @ 7X7 RCBC)

EXCAVATION IN WETLAND

FILL IN WETLAND

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

IMPACTS IN SURFACE WATER (3 @ 7X7 RCBC)

SITE 15
WBT

SITE 16
WBP
SDR
SCY

MECHANIZED CLEARING IN WETLAND

IMPACTS IN SURFACE WATER (BANK STABILIZTION) SEE DETAIL AAA

TEMP. IMPACTS IN SURFACE WATER

FOR CURVE DATA, SEE SHEET 2B–2
FOR DITCH DETAIL, SEE SHEETs 2D–1, 2D–2
FOR –L– PROFILE, SEE SHEET 30 & 31

50′ 0′ 50′ 100′ 150′
GRAPHIC SCALE

6/17/2019
I-4400C_HYD_PRM_PSH_12.dgn
HNTB

7/19/2017

WETLAND & STREAM IMPACTS

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-4400C	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 30 OF 43

LEGEND

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

NAD 83/NA 2011

MATCHLINE SHEET 11
–L– STA 760+00.00

MATCHLINE SHEET 13
–L– STA 774+00.00

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL CCC

FILL IN WETLAND

SITE 13
SCZ
WBL

SITE 14
SCY

DOWNSTREAM CULVERT CHANNEL IMPROVEMENTS SEE DETAIL BBB

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL BBB

IMPACTS IN SURFACE WATER (3 @ 7X7 RCBC)

WARRIOR GOLF MANAGEMENT, LLC

-BL-11 PINC 131+69.37

-BL-12 PINC 141+27.15

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

DOWNSTREAM CULVERT CHANNEL IMPROVEMENTS SEE DETAIL CCC

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

2' LAT. BASE DITCH SEE DETAIL BB

2' LAT. BASE DITCH SEE DETAIL C EST. 250 CY DDE

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

18" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

60" RCP-IV BLIND JB

60" RCP-IV BLIND JB

15" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

EXTEND 3 @ 7' X 7' RCBC HW W/ WINGWALLS

REMOVE HW & WINGWALLS

15" CSP W/ELBOWS – USE ROD & LUG CONNECTORS

2GI-B FG

60" WELDED STEEL PIPE 0.750" WALL THICKNESS TRENCHLESS INSTALLATION

PLUG AND FLOWABLE FILL

15" RCP-IV REMOVE

7' X 7' TRIPLE BARREL CULVERT

CULVERT –L– STA. 769+93.36

TB2GI-B FG

REMOVE DI

15" RCP-IV

EXCAVATION IN WETLAND

FILL IN WETLAND

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

IMPACTS IN SURFACE WATER (3 @ 7X7 RCBC)

BLIND JB

REMOVE HW

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

EXTEND 3 @ 7' X 7' RCBC HW W/ WINGWALLS

REMOVE HW & WINGWALLS

REMOVE

CLASS 'B' RIPRAP EST. 3 TONS EST. 5 SYGF

UPSTREAM CULVERT CHANNEL IMPROVEMENTS SEE DETAIL AAA

15" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

UPSTREAM CULVERT CHANNEL IMPROVEMENTS WITH FLOODPLAIN BENCH SEE DETAIL DDD

SITE 15
WBT

SITE 16
WBP
SDR
SCY

Q2= 23 cfs
V2= 6.2 fps
Q10= 44 cfs
V10= 6.7 fps

RUGBY GRANGE FARMS, LLC

MECHANIZED CLEARING IN WETLAND

2' LAT. BASE DITCH SEE DETAIL T EST. 106 CY DDE

2' LAT. BASE DITCH, SEE DETAIL X EST. 325 TONS EST. 460 SYGF EST. 406 CY DDE

IMPACTS IN SURFACE WATER (BANK STABILIZTION) SEE DETAIL AAA

TEMP. IMPACTS IN SURFACE WATER

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

FOR CURVE DATA, SEE SHEET 2B–2
FOR DITCH DETAIL, SEE SHEETs 2D–1, 2D–2
FOR –L– PROFILE, SEE SHEET 30 & 31

6/17/2019
I-4400C_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-4400C	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 31 OF 43

NAD 83/NA 2011

765

SITE 13

SCZ | WBL

SITE 15

WBT

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL CCC

FILL IN WETLAND

DOWNSTREAM CULVERT CHANNEL IMPROVEMENTS SEE DETAIL CCC

60" RCP-IV BLIND JB

60" RCP-IV BLIND JB

60" WELDED STEEL PIPE 0.750" WALL THICKNESS TRENCHLESS INSTALLATION

PLUG AND FLOWABLE FILL

EXCAVATION IN WETLAND

FILL IN WETLAND

60" RCP-IV

REMOVE HW

FILL IN WETLAND

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

UPSTREAM CULVERT CHANNEL IMPROVEMENTS WITH FLOODPLAIN BENCH SEE DETAIL DDD

MECHANIZED CLEARING IN WETLAND

764 765 766

12" CMP

INV=2048.34'

INV=2048.22'

MTL

EXISTING R/W

RUGBY GRA

LEGEND

S S	DENOTES IMPACTS IN SURFACE WATER
F F	DENOTES FILL IN WETLAND
* * * * * *	DENOTES MECHANIZED CLEARING
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-4400C	12
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 32 OF 43

NAD 83/NA 2011

SITE 13

SCZ | WBL

SITE 15

WBT

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL CCC

FILL IN WETLAND

DOWNSTREAM CULVERT CHANNEL IMPROVEMENTS SEE DETAIL CCC

60" RCP-IV BLIND JB

60" RCP-IV BLIND JB

60" WELDED STEEL PIPE 0.750" WALL THICKNESS TRENCHLESS INSTALLATION

PLUG AND FLOWABLE FILL

EXCAVATION IN WETLAND

FILL IN WETLAND

60" RCP-IV

REMOVE HW

FILL IN WETLAND

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

UPSTREAM CULVERT CHANNEL IMPROVEMENTS WITH FLOODPLAIN BENCH SEE DETAIL DDD

MECHANIZED CLEARING IN WETLAND

764 765 766

12" CMP

INV=2048.34'

INV=2048.22'

INV=2049.47'

RETA

MTL

EXISTING R/W

RUGBY GRA

LEGEND

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

50' 0' 50' 100' 150'

GRAPHIC SCALE

WETLAND & STREAM IMPACTS

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-4400C	12
R/W SHEET NO.	
	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 33 OF 43

50′ 0′ 50′ 100′ 150′
GRAPHIC SCALE

NAD 83/NA 2011

SITE 14 | **SCY**

TEMP. IMPACTS IN SURFACE WATER

DOWNSTREAM CULVERT CHANNEL IMPROVEMENTS SEE DETAIL BBB

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL BBB

IMPACTS IN SURFACE WATER (3 @ 7X7 RCBC)

KIMSEY CREEK

PDE

48" WW & ISBW

EXISTING R/W

REMOVE HW & WINGWALLS

EXTEND 3 @ 7′ X 7′ RCBC HW W/WINGWALLS

RETAIN

7′ X 7′ TRIPLE BARREL CULVERT

CULVERT –L– STA. 769+93.36

REMOVE

768 769 770 771

LEGEND

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

FILL IN WETLAND

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

CLASS 'B' RIPRAP EST. 3 TONS EST. 5 SYGF

MECHANIZED CLEARING IN WETLAND

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

IMPACTS IN SURFACE WATER (BANK STABILIZTION) SEE DETAIL AAA

IMPACTS IN SURFACE WATER (3 @ 7X7 RCBC)

REMOVE HW & WINGWALLS

UPSTREAM CULVERT CHANNEL IMPROVEMENTS SEE DETAIL AAA

TEMP. IMPACTS IN SURFACE WATER

SITE 16 | **WBP** | **SDR** | **SCY**

WETLAND & STREAM IMPACTS

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-4400C	12
R/W SHEET NO.	
	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 34 OF 43

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

NAD 83/NA 2011

SITE 14 | SCY

TEMP. IMPACTS IN SURFACE WATER

DOWNSTREAM CULVERT CHANNEL IMPROVEMENTS SEE DETAIL BBB

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL BBB

IMPACTS IN SURFACE WATER (3 @ 7X7 RCBC)

KIMSEY CREEK

PDE

EXTEND 3 @ 7' X 7' RCBC HW W/WINGWALLS

REMOVE HW & WINGWALLS

RETAIN

7' X 7' TRIPLE BARREL CULVERT

CULVERT –L–
STA. 769+93.36

REMOVE

LEGEND

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

FILL IN WETLAND

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

CLASS 'B' RIPRAP
EST. 3 TONS
EST. 5 SYGF

MECHANIZED CLEARING IN WETLAND

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

SITE 16 | WBP | SDR | SCY

IMPACTS IN SURFACE WATER (3 @ 7X7 RCBC)

REMOVE HW & WINGWALLS

EXTEND 3 @ 7' X 7' RCBC HW W/ WINGWALLS

IMPACTS IN SURFACE WATER (BANK STABILIZTION) SEE DETAIL AAA

UPSTREAM CULVERT CHANNEL IMPROVEMENTS SEE DETAIL AAA

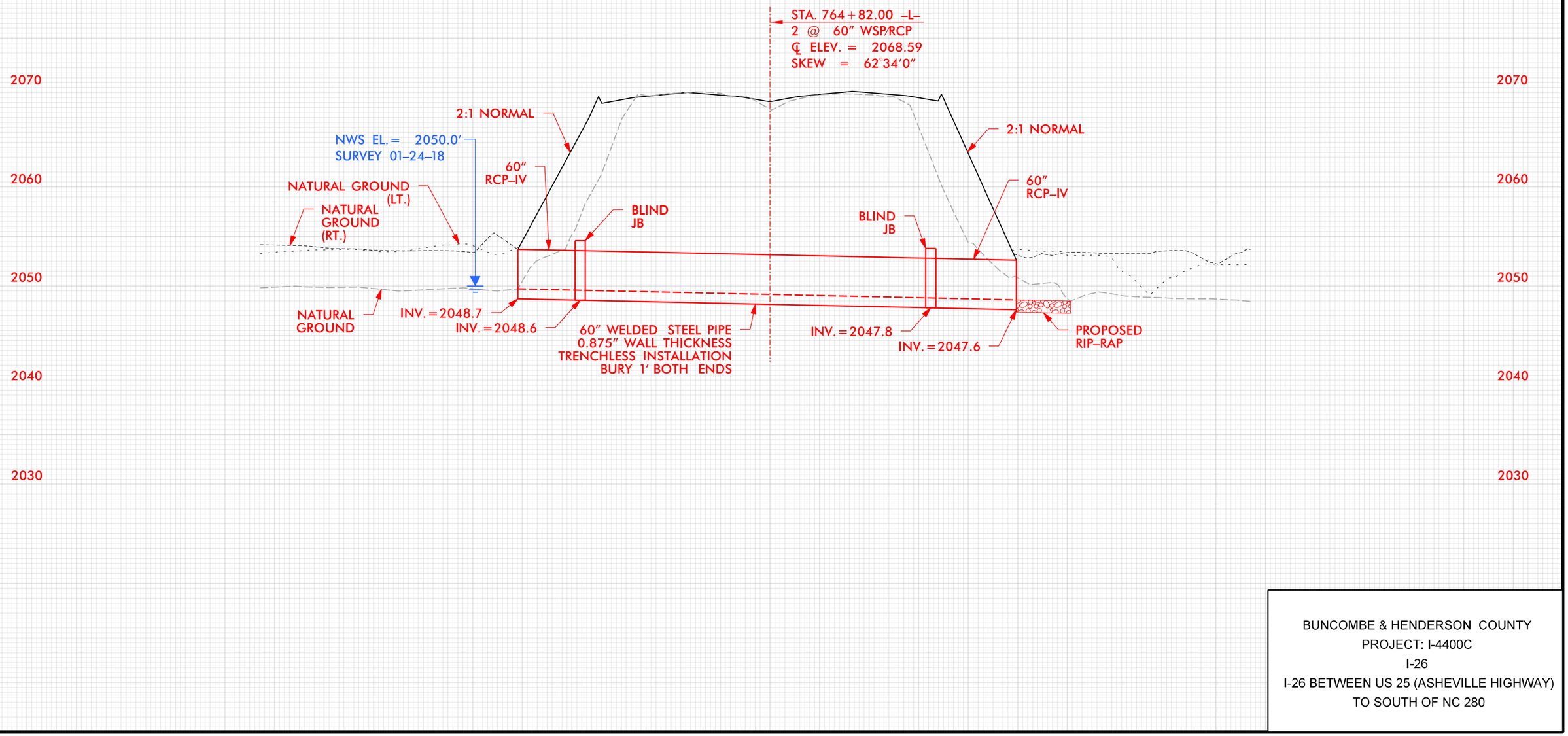
TEMP. IMPACTS IN SURFACE WATER

6/23/16

PROJ. REFERENCE NO.	SHEET NO.
I-4700	

PERMIT DRAWING
SHEET 35 OF 43

250 200 150 100 50 ℄ 50 100 150 200 250



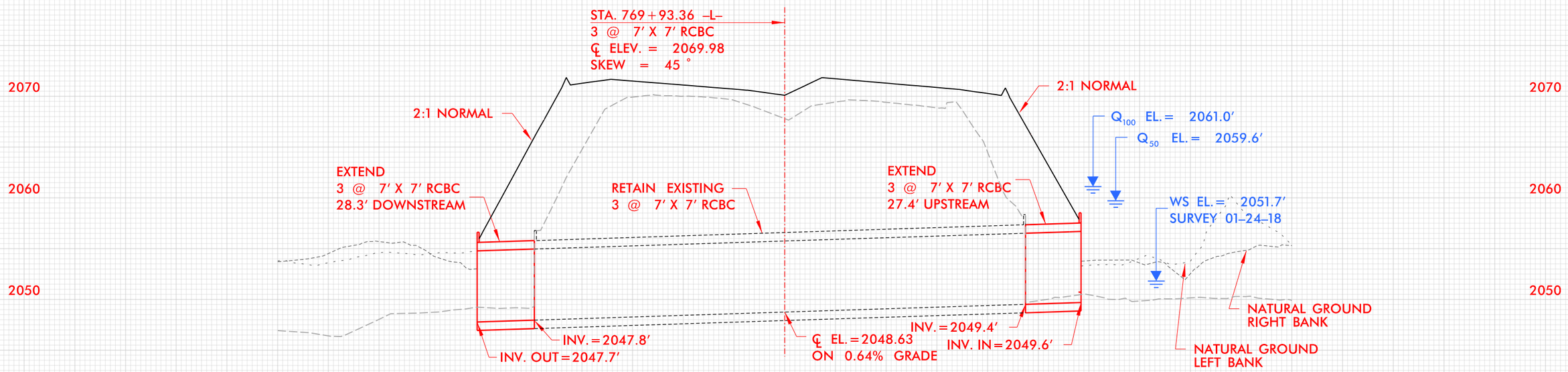
BUNCOMBE & HENDERSON COUNTY
PROJECT: I-4400C
I-26
I-26 BETWEEN US 25 (ASHEVILLE HIGHWAY)
TO SOUTH OF NC 280

3/4/2019
I-4400C_HYD_PRM_PSH_12A_PFL.dgn
HNTB

6/23/16

PROJ. REFERENCE NO.	SHEET NO.
I-4700	

PERMIT DRAWING
SHEET 36 OF 43



PROFILE

BUNCOMBE & HENDERSON COUNTY
PROJECT: I-4400C
I-26
I-26 BETWEEN US 25 (ASHEVILLE HIGHWAY)
TO SOUTH OF NC 280

3/4/2019
I-4400C_HYD_PRM_PSH_12B_PFL.dgn
HNTB

6/23/16

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

PERMIT DRAWING
SHEET 37 OF 43

WETLAND CROSS SECTIONS

SITE 15
–L– 764+12.00

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

BUNCOMBE & HENDERSON COUNTY
PROJECT: I-4400C
I-26
I-26 BETWEEN US 25 (ASHEVILLE HIGHWAY)
TO SOUTH OF NC 280

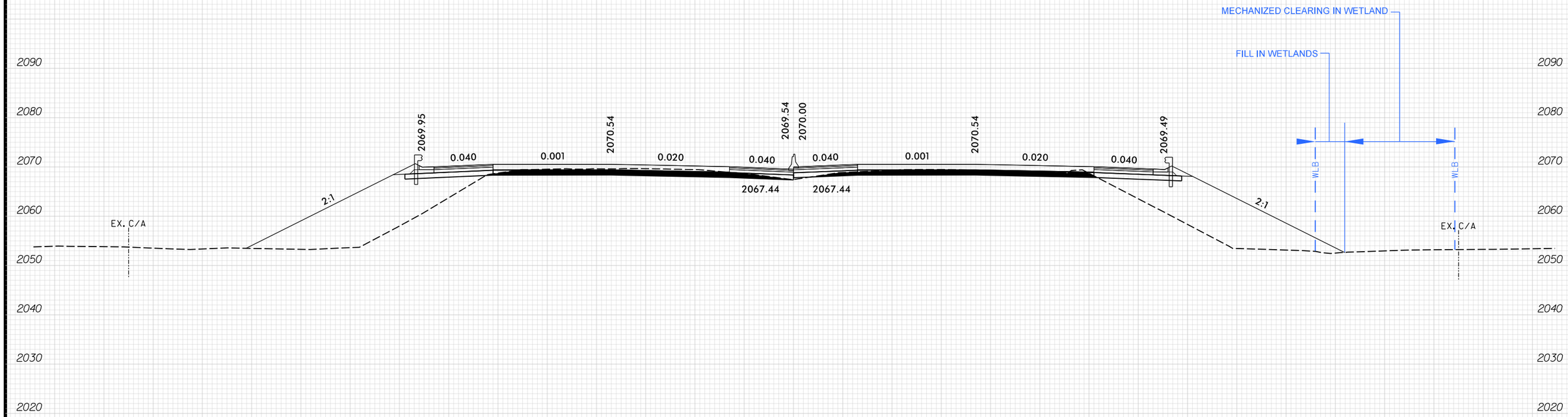
3/6/2018
I-4400C_HYD_PRM_PSH_XPL
HNTB

6/23/16

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

PERMIT DRAWING
SHEET 38 OF 43

WETLAND CROSS SECTIONS



SITE 16
–L– 768+00.00

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

BUNCOMBE & HENDERSON COUNTY
PROJECT: I-4400C
I-26
I-26 BETWEEN US 25 (ASHEVILLE HIGHWAY)
TO SOUTH OF NC 280

3/6/2019
I-4400C_HYD_PRM_PSH_XPL
HNTB

7/19/2017

WETLAND & STREAM IMPACTS

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-4400C	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 39 OF 43

REST AREA DRAINAGE DESIGN TO BE COMPLETED BY OTHERS PRIOR TO FINAL REDLINE SUBMITTAL

STRUCTURES LABELED "BY OTHERS" REPRESENT ANTICIPATED OUTLET LOCATIONS

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

NAD 83/NA 2011

CITY OF ASHEVILLE
DB 1906 PG 324

NORTH CAROLINA DEPT. OF TRANS
DB 732 PG 626

BUNCOMBE COUNTY
HENDERSON CO.

BM18 ELEVATION = 2110.95
N 628991 E 948777
BL STATION 162+59.00 140 LEFT
CHISELED 'X' ON CONC. LIGHT BASE

-BL-15 PINC 158+28.50

-BL-15 PINC 166+99.40

N 12°04'36.8" W

MATCHLINE SHEET 13
-L- STA 788+00.00

MATCHLINE SHEET 15
-L- STA 802+00.00

REST AREA BLDG

VENDING

REST A

REST B

REST C

REST D

RESTA

RESTB

RESTC

RESTD

L1

L2

L3

L4

PLUG AND FLOWABLE FILL

REMOVE DI

REMOVE

REMOVE HW

REMOVE CB

FLOWABLE FILL

IMPACTS IN SURFACE WATER (42" RCP)

PIPE NOT BURIED

JS

SITE 17

S1

TEMP. IMPACTS IN SURFACE WATER

WB-HAZ BASIN

HW WITH SLUICE GATE

SUSAN ELIZABETH LANCE, ET AL
DB WILL PG BUNC IE
(DB 625 PG 291)

STARLING & UNDERWOOD
DB 1500 PG 272

FOR –L– PROFILE, SEE SHEET 32 & 33
FOR –RESTA– PROFILE, SEE SHEET 46
FOR –RESTB– PROFILE, SEE SHEET 47
FOR –RESTC– PROFILE, SEE SHEET 47
FOR –RESTD– PROFILE, SEE SHEET 48

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

3/6/2019
I:\I-4400C_HYD_PRM_PSH_14.dgn
HNTB

WETLAND & STREAM IMPACTS

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-4400C	14
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 40 OF 43

REST AREA DRAINAGE DESIGN TO BE COMPLETED BY OTHERS PRIOR TO FINAL REDLINE SUBMITTAL

STRUCTURES LABELED "BY OTHERS" REPRESENT ANTICIPATED OUTLET LOCATIONS

LEGEND

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

NAD 83/NA 2011

BM18 ELEVATION = 2110.95
N 628991 E 948777
BL STATION 162+59.00 140 LEFT
CHISELED 'X' ON CONC. LIGHT BASE

MATCHLINE SHEET 13
–L– STA 788+00.00

MATCHLINE SHEET 15
–L– STA 802+00.00

SITE 17
S1

IMPACTS IN SURFACE WATER (42" RCP)

PIPE NOT BURIED

JS

TEMP. IMPACTS IN SURFACE WATER

FOR –L– PROFILE, SEE SHEET 32 & 33
FOR –RESTA– PROFILE, SEE SHEET 46
FOR –RESTB– PROFILE, SEE SHEET 47
FOR –RESTC– PROFILE, SEE SHEET 47
FOR –RESTD– PROFILE, SEE SHEET 48

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

7/19/2017

3/6/2019
I-4400C_HYD_PRM_PSH_14.dgn
HNTB

8/22/2017

WETLAND & STREAM IMPACTS

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-4400C	21
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 41 OF 43

LEGEND

JS JS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83/NA 2011

SITE 18

SDH

TEMP. IMPACTS IN SURFACE WATER

MATCHLINE SHEET 15 –Y12– STA 21+40.00

FOR –Y12– PROFILE, SEE SHEET 45

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

STATE OF NORTH CAROLINA

3/3/2018
I-4400C_HYD_PRM_PSH_21.dgn
HNTB

8/22/2017

WETLAND & STREAM IMPACTS

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-4400C	21
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 42 OF 43

LEGEND

JS JS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

NAD 83/NA 2011

SITE 18

SDH

TEMP. IMPACTS IN SURFACE WATER

MATCHLINE SHEET 15 –Y12– STA 21+40.00

FOR –Y12– PROFILE, SEE SHEET 45

50′ 0′ 50′ 100′ 150′
GRAPHIC SCALE

3/5/2018
I-4400C_HYD_PRM_PSH_21.dgn
HNTB

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)	Indirect impacts to Wetlands *2 (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 Mud Creek / SCN	L 654+45 to 656+54 LT	Stream relocated to Proposed 2' Lat. Base ditch Due to Roadway Widening								197	10	
1	UT to Mud Creek / SCK	L 656+06 to 656+47 LT	Bank Stabilization at outlet of 60" RCP								45	7	
1	UT to Mud Creek / SCK	L 656+37 to 656+62 LT	60" RCP extension Due to Roadway Widening								30		
2	UT to Mud Creek / SCK	L 657+93 to 657+97 RT	Bank Stabilization at inlet of 60" CMP								23	10	
2	UT to Mud Creek / SCK	L 657+95 to 658+19 RT	60" CMP extension Due to Roadway Widening								58		
2	UT to Mud Creek / SCL	L 658+13 to 659+29 RT	Stream relocated to Proposed 2' Lat. Base ditch Due to Roadway Widening								126	10	
3	UT to Mud Creek / SCO	L 665+93 to 666+02 LT	Bank Stabilization at outlet of existing 60" CMP								12		
4	UT to Mud Creek / SCO	L 666+73 to 666+83 RT	Proposed 60" RCP Extension and Head Wall								0	8	
5	UT to Mud Creek / SEN	Y10RPA 16+28 to 19+65 RT	Stream relocated to Proposed 2' Lat. Base ditch Due to Roadway Widening								353		
5	UT to Mud Creek / SCQ	Y10RPA 16+07 to 16+34 RT	Proposed 48" WSP with 48" RCP extension								58		
5	UT to Mud Creek / SCQ	Y10RPA 16+02 to 16+11 RT	Channel Change*1 at downstream of 48" RCP								26	10	
5	WBC	Y10RPA 16+47 to 19+59 RT	Fill and Proposed 2' Lat. Base ditch in Wetlands Due to Roadway Widening	0.07		0.06	0.04				0		
5	WBC	Y10RPA 17+09 to 19+14 RT	Indirect wetland impacts outside of Right of Way					0.05			0		
6	UT to Mud Creek / SCT	L 687+38 to 690+50 LT	Stream relocated to Proposed 2' Lat. Base ditch Due to Roadway Widening								316	10	
7	UT to Mud Creek / SCR	L 683+99 to 684+20 RT	Stream relocated to 2' Lat. Base ditch due to Roadway Widening								23		
7	UT to Mud Creek / SCR	L 683+46 to 684+04 RT	Propsed 42" RCP and 48" RCP								83	10	
7	UT to Mud Creek / SCQ	L 683+46 to 684+04 RT	Stream relocated to Proposed 2' Lat. Base ditch Due to Roadway Widening								430	10	
8	WBG	L 716+43 to 724+47 RT	Fill in Wetlands Due to Roadway Widening	0.09			0.20				0		
8	UT to Cane Creek / SCU	L 724+42 to 724+92 RT	Stream relocated to Upstream Culvert Channel Improvements with Floodplain Bench								47		
8	UT to Cane Creek / SCU	L 724+89 to 725+19 RT	Existing 36" RCP Extension Due to Roadway Widening								32		
9	UT to Cane Creek / SCU	L 726+63 to 726+97 LT	Existing 36" RCP Extension Due to Roadway Widening								37		
9	UT to Cane Creek / SCU	L 726+91 to 727+16 LT	Bank Stabilization at outlet of existing 36" RCP with 36"RCP extension								29		
9	UT to Cane Creek / SCU	L 727+13 to 727+28 LT	Stream relocated to 2' Lat. Base ditch due to Roadway Widening								15	8	
10	WBI	L 746+94 to 748+84 LT	Mechanized Clearing in wetland due to Roadway Widening				0.02				0		
11	UT to Cane Creek / SCX	L 747+73 to 747+86 RT	Stream relocated to Proposed Channel Change								13	11	
11	UT to Cane Creek / SCX	L 747+81 to 748+25 RT	Bank Stabilization at beginning of Channel Change								53		
11	UT to Cane Creek / SCX	L748+25 to 755+02 RT	Stream relocated to Proposed Channel Change								682		
11	UT to Cane Creek / SCX	L 754+95 to 755+17 RT	Channel Change*1 at outlet of Proposed Channel Change								18		
12	Cane Creek	L 755+16 to 756+68 LT / RT	Bank Stabilization								334	20	
13	UT to Kimsey Creek / SCZ	L 765+43 to 765+59 LT	Bank Stabilization at the outlet of 2 @ 60" RCP								32		
13	WBL	L 765+53 to 765+60 LT	Fill in Wetlands Due to Roadway Widening	< 0.01							0		
14	Kimsey Creek / SCY	L 768+40 to 768+85 LT	Bank Stabilization at outlet of 3 @ 7X7 RCBC								45	9	
14	Kimsey Creek / SCY	L 768+64 to 769+22 LT	Proposed 3 @ 7X7 RCBC								48		
15	WBT	L 764+02 to 764+54 RT	Fill and Proposed Upstream Culvert Channel Improvements	< 0.01		< 0.01	< 0.01				0		
16	WBP	L 765+90 to 769+39 RT	Fill in Wetlands Due to Roadway Widening	0.01			0.15				0		
16	UT to Kimsey Creek / SDR	L 768+59 to 770+77 RT	Stream relocated to Proposed 2' Lat. Base ditch Due to Roadway Widening								216		
16	Kimsey Creek / SCY	L 770+62 to 770+97 RT	Proposed 3 @ 7X7 RCBC								22		
16	Kimsey Creek / SCY	L 770+81 to 771+19 RT	Bank Stabilization at inlet of 3 @ 7X7 RCBC								34	10	
17	UT to French Broad River / S1	L 789+57 to 790+79 RT	Proposed 42" RCP								122	10	
18	UT to French Broad River / SDH	Y12 19+34 to 19+60 LT	Temporary impacts from constructing Roadway fill slope									25	
TOTALS*:				0.18		0.06	0.42	0.05			3559	178	

*Rounded totals are sum of actual impacts

NOTES:
*1: Emedding Riprap
*2: Indirect wetland impacts outside of Right of Way

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
7/16/2019
Henderson County
I-4400C

Revised 2018 Feb

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

General Project Information

WBS Element:	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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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?
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.

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

Preformed Scour Holes and Energy Dissipators

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Energy Dissipator Type	Riprap Type	Drainage Area (ac)	Conveyance Structure	Pipe/Structure Dimensions (in)	Q10 (cfs)	V10 (fps)	BMP Associated w/ Buffer Rules?
15	-EBL- Sta. 979+10 LT 35.472805,-82.553136		Riprap Energy Dissipator Basin	Class 'B'	1.8	Pipe	15	7.8	3.9	No
15	-EBL- Sta. 982+60 LT 35.473689,-82.553597		Riprap Energy Dissipator Basin	Class 'B'	0.9	Pipe	15	4.6	1.3	No
15	-EBL- Sta. 984+89 LT 35.474198,-82.554120	(9)SDN - Powell Creek	Riprap Energy Dissipator Basin	Class II	3200.0	Culvert	2 - 10'x10'	2100.0	6.4	No
15	-EBL- Sta. 986+81 LT 35.474774,-82.554125		Riprap Energy Dissipator Basin	Class 'B'	0.8	Pipe	15	3.9	2.1	No
15	-EBL- Sta. 988+21 LT 35.475142,-82.554286		Riprap Energy Dissipator Basin	Class I	14.4	Pipe	36	26.0	2.4	No
16	-EBL- Sta. 997+00 LT 35.478557,-82.555327		Riprap Energy Dissipator Basin	Class 'B'	3.0	Pipe	18	13.6	2.2	No
18	-Y15RPA- Sta. 12+61 RT 35.484131,-82.559644	(10)SDU - UT to French	Riprap Energy Dissipator Basin	Class I	42.6	Pipe	2 - 48	100.0	4.3	No
19	1901-OUT -L-1030+10 -LT 35.484882,-82.560431	WCH	Energy Dissipator		1.6	Pipe	15	5.3	2.3	N/A
19	-L2- Sta. 1033+98 LT 35.485702,-82.561315		Riprap Energy Dissipator Basin	Class 'B'	4.8	Pipe	24	13.2	1.9	No
19	1918-OUT -L- 1037+44 -LT 35.486507,-82.562060	WCH	Energy Dissipator		3.5	Pipe	18	13.7	3.0	N/A
20	-L2- Sta. 1043+48 LT 35.488122,-82.562915		Riprap Energy Dissipator Basin	Class I	36.1	Pipe	2 - 42	80.0	5.1	No
20	2011-OUT -L- 1044+39 -LT 35.488388,-82.562965		Energy Dissipator		0.6	Pipe	15	1.3	2.5	N/A
20	2019-OUT -L- 1046+84 -LT 35.489072,-82.563137	WCH	Energy Dissipator		0.4	Pipe	15	1.3	2.5	N/A
20	-L2- Sta. 1047+77 LT 35.489330,-82.563227		Riprap Energy Dissipator Basin	Class I	151.4	Pipe	1 - 60", 1 - 42"	260.0	5.2	No
20	2032-OUT -L- 1051+86 -LT 35.490368,-82.563401		Riprap Energy Dissipator Basin	Class 'B'	1.1	Pipe	18	5.3	1.7	N/A
21	2101-Out -L- 1057+00 RT 35.49194, -82.56278		Riprap Energy Dissipator Basin	Class 'B'	0.4	Pipe	15	1.9	1.2	No

Additional Comments

* 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.

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

Preformed Scour Holes and Energy Dissipators

Sheet No.	Station & Coordinates (Road and Non Road Projects)	Surface Water Body	Energy Dissipator Type	Riprap Type	Drainage Area (ac)	Conveyance Structure	Pipe/Structure Dimensions (in)	Q10 (cfs)	V10 (fps)	BMP Associated w/ Buffer Rules?
21	2153 -L- 1058+62 LT 35.49229, -82.56365		Riprap Energy Dissipator Basin	Class 'B'	9.0	Pipe	30	15.0	3.6	No
21	2107 -L- 1061+00 LT 35.49295, -82.56362		Riprap Energy Dissipator Basin	Class 'B'	1.4	Pipe	18	6.0	1.9	No
21	2114-OUT -L- 1066+04 -LT 35.494175,-82.564181		Energy Dissipator		5.0	Pipe	18	10.5	2.8	N/A
21	2202-Out -L- 1068+62 LT 35.49485, -82.56436		Riprap Energy Dissipator Basin	Class 'B'	7.6	Pipe	24	24.1	2.5	No
23	2318-OUT -WBL- 1090+50 -RT 35.500109,-82.567832	(13)SDX - UT to French	Energy Dissipator		22.4	Pipe	30	32.1	3.9	N/A
23	2353 -WBL- 1094+05 LT 35.50073, -82.56898	(13)SDX - UT to French	Riprap Energy Dissipator Basin	Class I	44.9	Pipe	48	47.0	6.8	No
24	2452 -EBL- 1097+32 RT 35.50143, -82.56955	(13)SDX - UT to French	Riprap Energy Dissipator Basin	Class I	6.5	Pipe	30	11.0	0.7	No
24	2462 -EBL- 1105+40 RT 35.50329, -82.57079	(13)SDX - UT to French	Riprap Energy Dissipator Basin	Class I	14.8	Pipe	30	22.0	1.1	No
24	2414-Out -EBL- 1106+90 RT 35.50381, -82.57036	(14)SDY - UT to French	Riprap Energy Dissipator Basin	Class 'B'	3.0	Pipe	24	11.0	0.6	No
24	2415 -L-WBL- 1105+00 LT 35.503596,-82.570267	(14)SDY - UT to French	Energy Dissipator		2.6	Pipe	24	12.7	2.9	N/A
24	2473 -WBL- 1107+25 LT 35.50421, -82.57043	(13)SDX - UT to French	Riprap Energy Dissipator Basin	Class I	5.3	Pipe	24	8.0	0.4	No
25	2411-Out -EBL- 1115+40 RT 35.50595, -82.57160		Riprap Energy Dissipator Basin	Class 'B'	8.8	Pipe	30	21.2	2.4	No
25	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

* 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.

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.08; Released April 2018)

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

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?
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

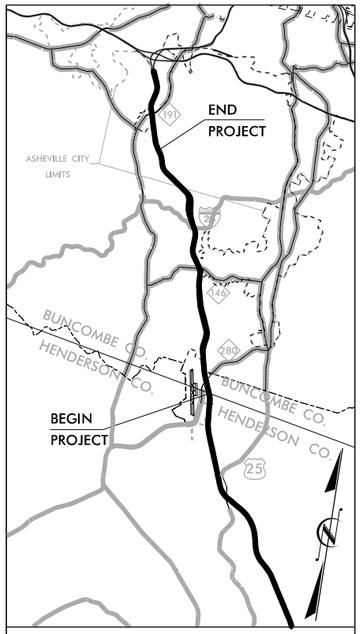
Additional Comments

* 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:



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BUNCOMBE & HENDERSON COUNTIES

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-4700	1	

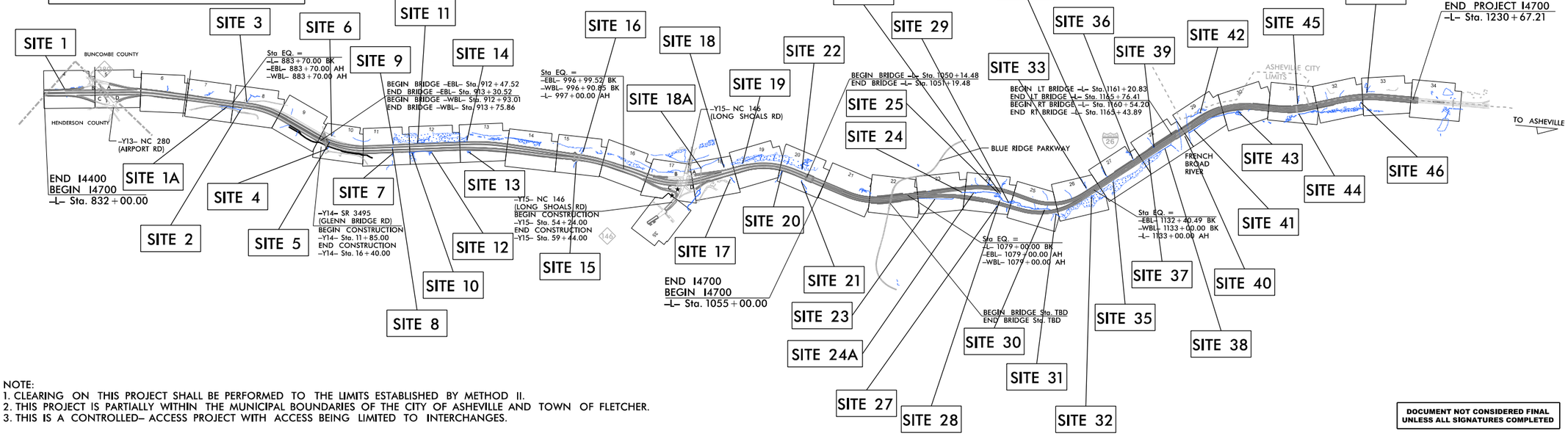
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
WBS 36030.1.2	IMNHF-026-1(86)9	I-4700(P.E.)
TBD	TBD	I-4700A(R/W/UTIL)
TBD	TBD	I-4700B(R/W/UTIL)
WBS 36030.3.3	NHPP-026-1(198)3	I-4700A(CONST)
WBS 36030.3.4	NHPP-026-1(199)6	I-4700B(CONST)

PERMIT DRAWING
SHEET 1 OF 97

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

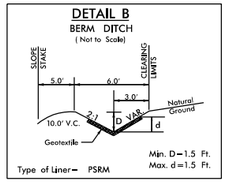
DRAINAGE DITCH DETAILS

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)

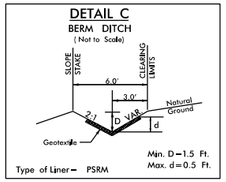


Min. D=1.5 Ft.
Max. d=1.5 Ft.

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)

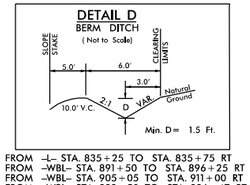


Min. D=1.5 Ft.
Max. d=0.5 Ft.

Type of Liner= PSRM

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

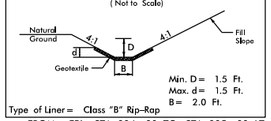
DETAIL D
BERM DITCH
(Not to Scale)



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)

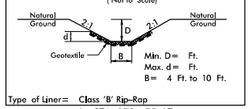


Min. D= 1.5 Ft.
Max. d= 1.5 Ft.
B= 2.0 Ft.

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)

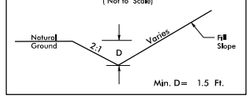


Min. D= Ft.
Max. d= Ft.
B= 4 Ft. to 10 Ft.

Type of Liner= Class 'B' Rip-Rap

–L– STA. 972+75 LT

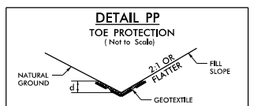
DETAIL G
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



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

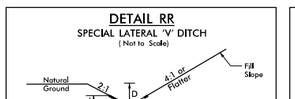
FROM –L– STA. 873+50 TO STA. 874+25 RT
FROM –Y15PRC– STA. 10+00 TO STA. 11+95 RT

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)

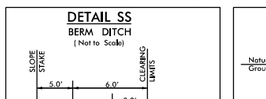


Min. D= 1.5 Ft.
Max. d= 1.0 Ft.
B= 2.0 Ft.
b= 5.0 Ft. (Min.)

Type of Liner= PSRM

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

DETAIL K
TOE PROTECTION
(Not to Scale)

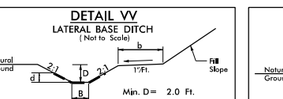


d= 1.0 Ft.
b= 4.0 Ft.

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

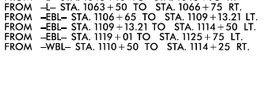
DETAIL R
LATERAL 'V' DITCH
(Not to Scale)

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)

D= 1.0'
B= 2.0'

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)

D= 1.0'
B= 2.0'

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.

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

8/17/99

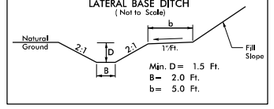
DRAINAGE DITCH DETAILS

HNTB NORTH CAROLINA, P.C.
343 Fayetteville Street Mall, 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

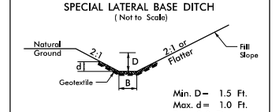
DETAIL YY
LATERAL BASE DITCH (Not to Scale)



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)

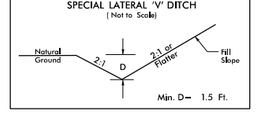


Min. D= 1.5 Ft.
Max. d= 1.0 Ft.
B= 2.0 Ft.

Type of Liner= Class 'B' Rip–Rap

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

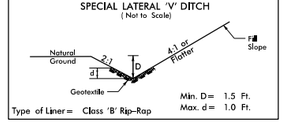
DETAIL AAA
SPECIAL LATERAL 'V' DITCH (Not to Scale)



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)

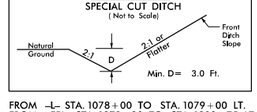


Min. D= 1.5 Ft.
Max. d= 1.0 Ft.

Type of Liner= Class 'B' Rip–Rap

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

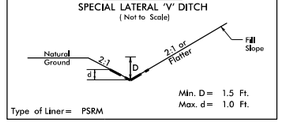
DETAIL CCC
SPECIAL CUT DITCH (Not to Scale)



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)

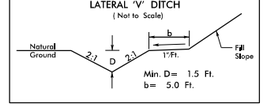


Min. D= 1.5 Ft.
Max. d= 1.0 Ft.

Type of Liner= PSRM

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

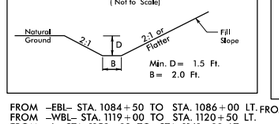
DETAIL EEE
LATERAL 'V' DITCH (Not to Scale)



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

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

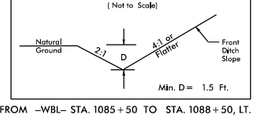
DETAIL FFF
SPECIAL LATERAL BASE DITCH (Not to Scale)



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.

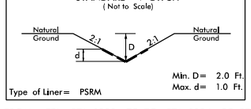
DETAIL GGG
SPECIAL CUT DITCH (Not to Scale)



Min. D= 1.5 Ft.

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

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

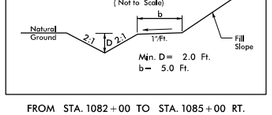


Min. D= 2.0 Ft.
Max. d= 1.0 Ft.

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.

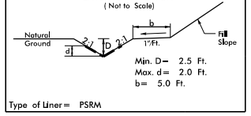
DETAIL III
LATERAL BASE DITCH (Not to Scale)



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)

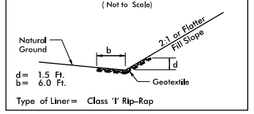


Min. D= 2.5 Ft.
Max. d= 2.0 Ft.
b= 5.0 Ft.

Type of Liner= PSRM

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

DETAIL LLL
TOE PROTECTION (Not to Scale)

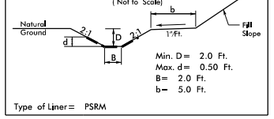


d= 1.5 Ft.
b= 6.0 Ft.

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)

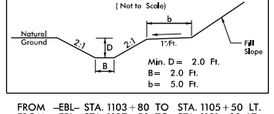


Min. D= 2.0 Ft.
Max. d= 0.50 Ft.
B= 2.0 Ft.
b= 5.0 Ft.

Type of Liner= PSRM

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

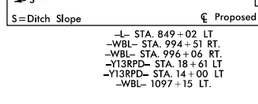
DETAIL NNN
LATERAL BASE DITCH (Not to Scale)



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.

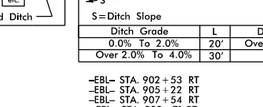
DETAIL OOO
SPECIAL LATERAL 'V' DITCH (Not to Scale)



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.

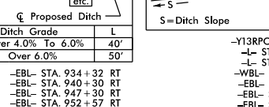
DETAIL PPP
STANDARD BASE DITCH (Not to Scale)



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

–WBL– STA. 1107+34 RT.

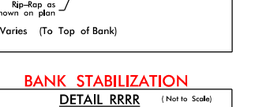
DETAIL QQQ
SPECIAL LATERAL BASE DITCH (Not to Scale)



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.

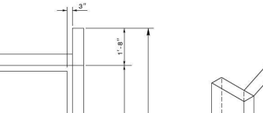
DETAIL UUU
SPECIAL LATERAL 'V' DITCH (Not to Scale)

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)

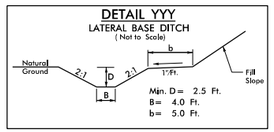
Min. D= 1.5 Ft.
Max. d= 0.5 Ft.
B= 2.0 Ft.

Type of Liner= PSRM

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

BANK STABILIZATION

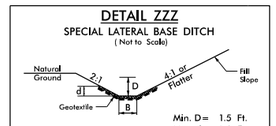
DETAIL YYY
LATERAL BASE DITCH (Not to Scale)



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)

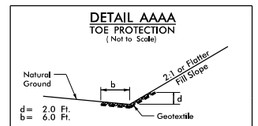


Min. D= 1.5 Ft.
Max. d= 1.0 Ft.
B= 2.0 Ft.

Type of Liner= Class 'I' Rip–Rap

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

DETAIL AAAA
TOE PROTECTION (Not to Scale)

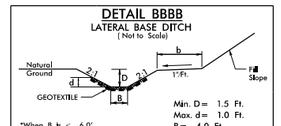


d= 2.0 Ft.
b= 6.0 Ft.

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)



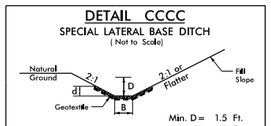
Min. D= 1.5 Ft.
Max. d= 1.0 Ft.
B= 4.0 Ft.
b= 5.0 Ft.

*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)

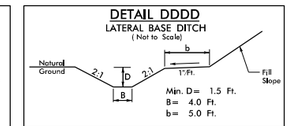


Min. D= 1.5 Ft.
Max. d= 1.0 Ft.
B= 4.0 Ft.

Type of Liner= Class "B" Rip–Rap

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

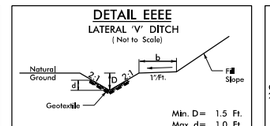
DETAIL DDDD
LATERAL BASE DITCH (Not to Scale)



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)

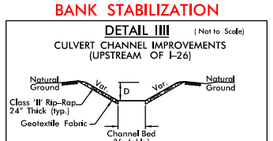


Min. D= 1.5 Ft.
Max. d= 1.0 Ft.
b= 5.0 Ft.

Type of Liner= Class 'B' Rip–Rap

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

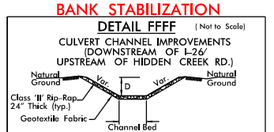
DETAIL IIII
(Not to Scale)
CULVERT CHANNEL IMPROVEMENTS (UPSTREAM OF I–26)



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

BANK STABILIZATION

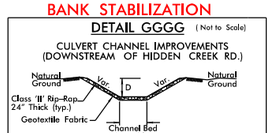
DETAIL FFFF
(Not to Scale)
CULVERT CHANNEL IMPROVEMENTS (DOWNSTREAM OF I–26/ UPSTREAM OF HIDDEN CREEK RD.)



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

BANK STABILIZATION

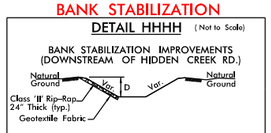
DETAIL GGGG
(Not to Scale)
CULVERT CHANNEL IMPROVEMENTS (DOWNSTREAM OF HIDDEN CREEK RD.)



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

BANK STABILIZATION

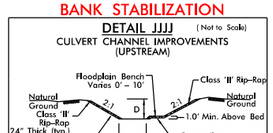
DETAIL HHHH
(Not to Scale)
BANK STABILIZATION IMPROVEMENTS (DOWNSTREAM OF HIDDEN CREEK RD.)



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

BANK STABILIZATION

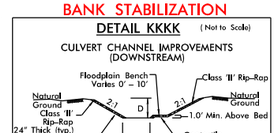
DETAIL JJJJ
(Not to Scale)
CULVERT CHANNEL IMPROVEMENTS (UPSTREAM)



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

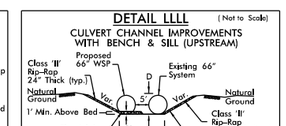
BANK STABILIZATION

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



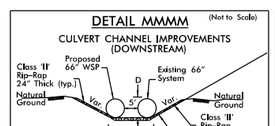
D=Varies (To Top of Bank)
EST. 201 CY EXCAVATION
EST. 299 TONS CLASS II RIPRAP
EST. 302 SY GEOTEXTILE FABRIC

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

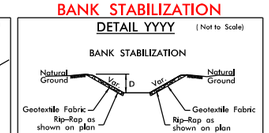
DETAIL MMMM
(Not to Scale)
CULVERT CHANNEL IMPROVEMENTS (DOWNSTREAM)



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

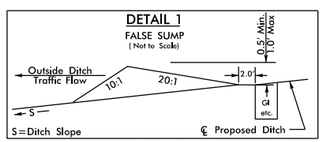
BANK STABILIZATION

DETAIL YYYY
(Not to Scale)
BANK STABILIZATION



D=Varies (To Top of Bank)

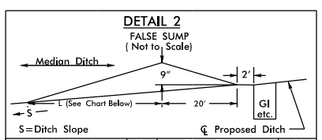
DETAIL 1
FALSE SUMP (Not to Scale)



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)

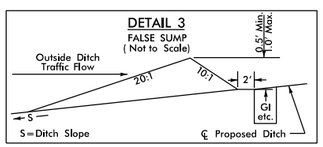


S=Ditch Slope ℄ Proposed Ditch

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)

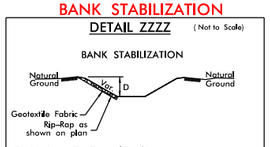


S=Ditch Slope ℄ Proposed Ditch

–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

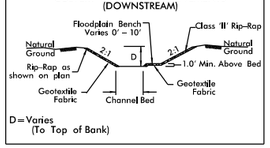
DETAIL ZZZZ
(Not to Scale)
BANK STABILIZATION



D=Varies (To Top of Bank)

BANK STABILIZATION

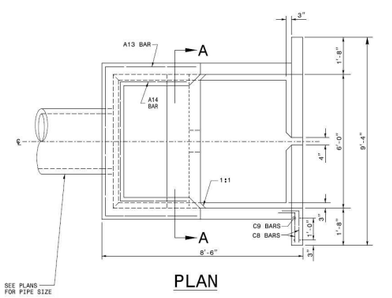
DETAIL RRRR
(Not to Scale)
CULVERT CHANNEL IMPROVEMENTS (DOWNSTREAM)



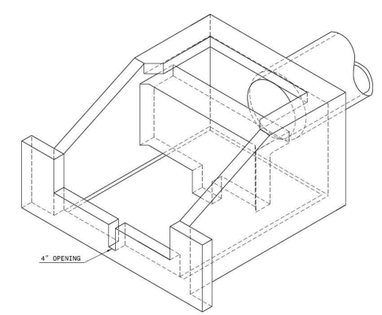
D=Varies (To Top of Bank)

SPECIAL DETAIL
CONCRETE ENERGY DISSIPATOR

USE THIS STRUCTURE FOR PIPE SIZES 15" THROUGH 36". THE PIPE MAY BE CSP OR RCP.



PLAN



12/3/2008
14700_HYD_PRM_DrainageDetails.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	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

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

11/30/2018
I-4700
HNTB

I-4700_HYD_PRM_PSH_04.dgn

8/17/99

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

PERMIT DRAWING
SHEET 4 OF 97

WETLAND & STREAM IMPACTS

NAD 83

NOTE:
AIRPORT ROAD UNDER CONSTRUCTION.
VARIOUS U/G UTILITIES WERE BEING RELOCATED AND
NOT SHOWN ON THE BASE 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

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
INTB
I-4700_HYD_PRM_PSH_04.dgn

8/17/99

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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

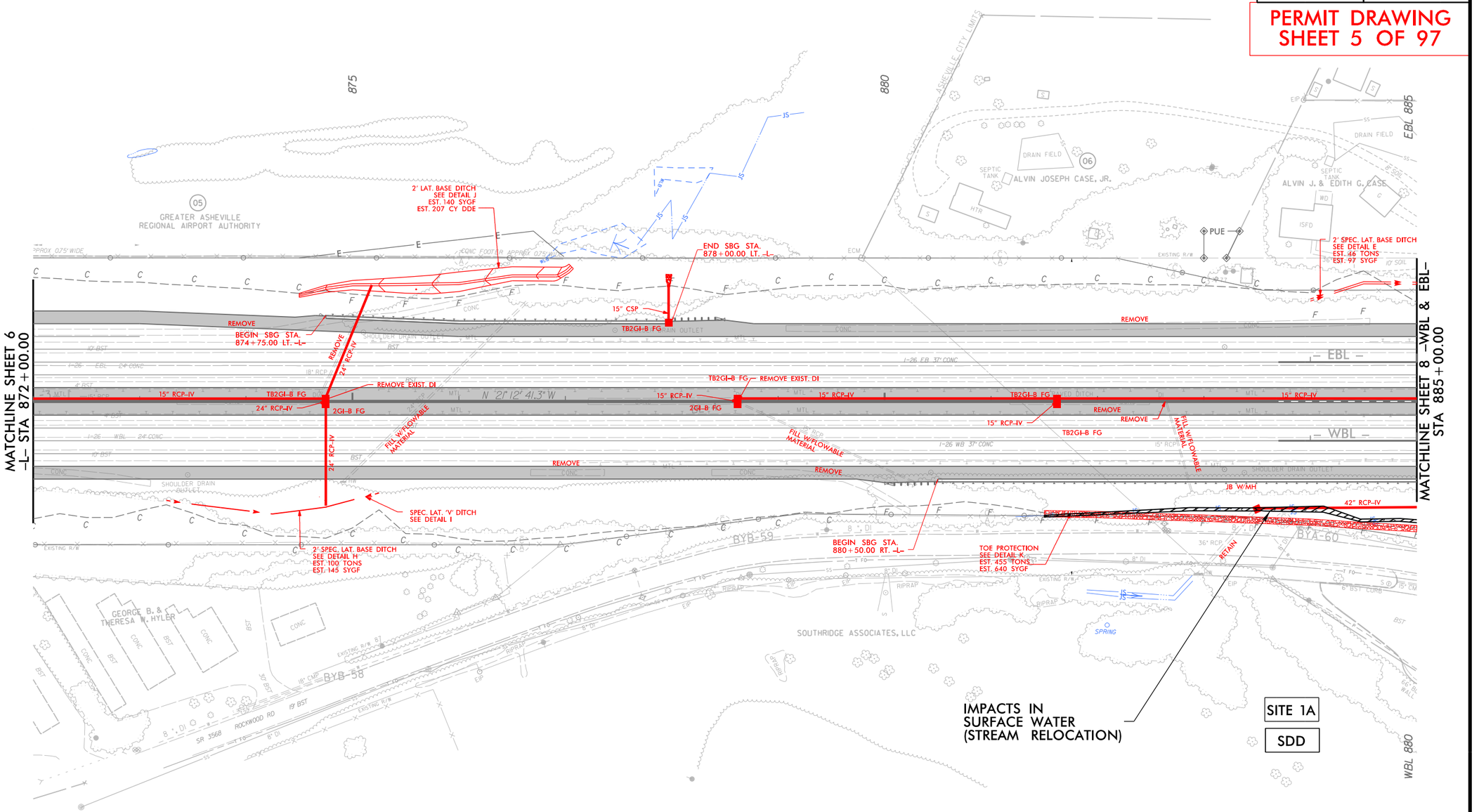
NAD 83

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:\24700A_HYD_PRM_PSH_07.dgn
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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

PERMIT DRAWING SHEET 6 OF 97

WETLAND & STREAM IMPACTS

NAD 83

LEGEND

DENOTES IMPACTS IN SURFACE WATER

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–

15" CSP

TB2GI-B FG

REMOVE

REMOVE EXIST. DI

15" RCP-IV

24" RCP-IV

2GI-B FG

FILL W/FLOWABLE MATERIAL

N 21°12'41.3"W

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

PUE

EBL

WBL

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

RETAIN

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

SITE 1A

SDD

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

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

11/24/2008
I:\24700A_HYD_PRM_PSH_07.dgn
HNTB

8/17/99

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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

PERMIT DRAWING
SHEET 7 OF 97

WETLAND & STREAM IMPACTS

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

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

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

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

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

SR 3525 HIDDEN CREEK RD 19' BST

SR 3568 ROCKWOOD RD 24' BST

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

18" CSP

30" CSP

REMOVE 23 LF OF EX. 18" CMP

2GI-B FG

18" RCP-IV

FILL W/ FLOWABLE MATERIAL

42" WELDED STEEL PIPE 0.625" WALL THICKNESS TRENCHLESS INSTALLATION

TB2GI-B FG

15" RCP-IV

30" RCP-IV

REMOVE

TB2GI-A FG

2GI-B SG

24" RCP-IV

REMOVE DI

TRIB W/MH

REMOVE 28 LF OF EX. 18" RCP

2GI-B FG

42" RCP-IV

JB W/MH

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

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

BERM DITCH SEE DETAIL M

24" CSP W/1 ELBOW

BDO

BERM DITCH SEE DETAIL B EST. 240 SYGF

RETAIN

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

8/17/99

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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
GREATER ASHEVILLE REGIONAL AIRPORT AUTHORITY
ALVIN J. & EDITH G. CASE
JERRY GLEN & 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 1A
SDD
SITE 2

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

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 L 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
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
BERM DITCH SEE DETAIL M
CLASS 'B' RIPRAP EST. 5 TONS EST. 14 SYGF
BERM DITCH SEE DETAIL B EST. 240 SYGF
REMOVE 28 LF OF EX. 18" RCP
REMOVE DI

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

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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
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
2GI–B FG

REMOVE 23 LF OF EX. 18"C CMP

2GI–B FG

FILL W/ FLOWABLE MATERIAL

18" RCP–IV

ED STEEL PIPE
/ALL THICKNESS
LESS
LATION

FILL W/ FLOWABLE MATERIAL

RETAIN

30" RCP–IV

888+00

TB2GI–B FG

TB2GI–A FG

15" RCP–IV

15" RCP–IV

TB2GI–B FG

TB2GI–B FG

887+00

888+00

889+00

15" RCP–IV

15" RCP–IV

2GI–B FG

2GI–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

NAD 83

SITE 3 | SDC

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL HHHH

BANK STABILIZATION SEE DETAIL HHHH

CULVERT CHANNEL IMPROVEMENTS (DOWNSTREAM) SEE DETAIL GGGG

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

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

887+00

888+00

889+00

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

SITE 2 | SDC

LEGEND

S S — DENOTES IMPACTS IN SURFACE WATER

TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

50' 0' 50' 100' 150'

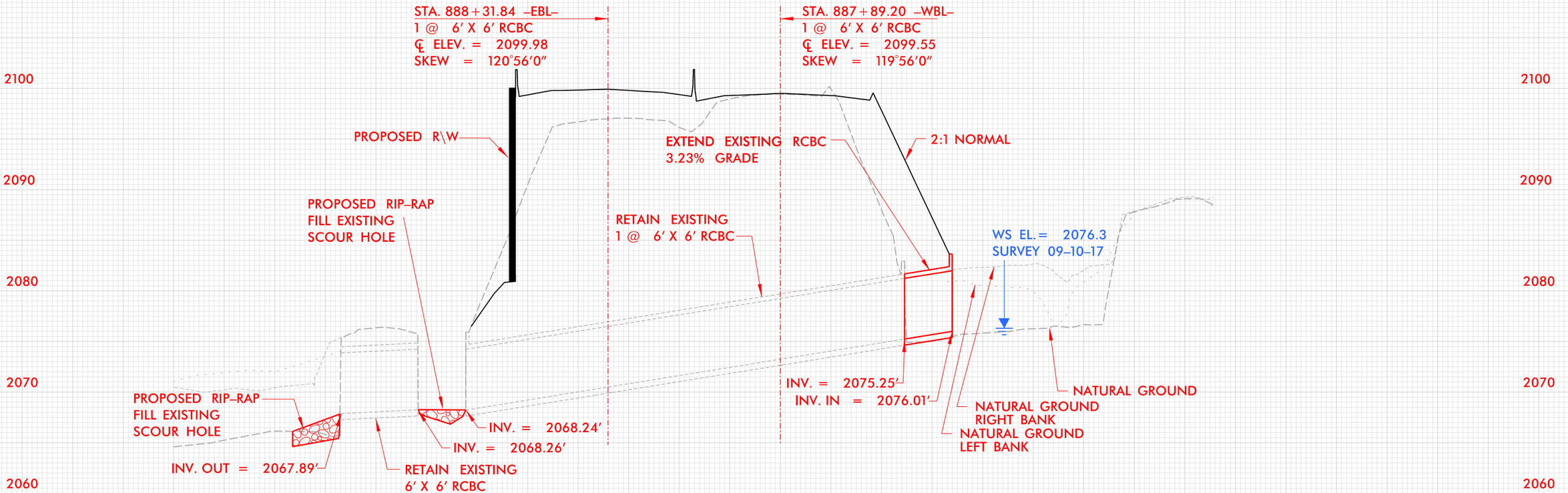
GRAPHIC SCALE

6/23/16

PROJ. REFERENCE NO.	SHEET NO.
I-4700	

PERMIT DRAWING
SHEET 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_088_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 -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 95

WBL 920

SR 3524 NEW ROCKWOOD ROAD

AUDREY CRAIG

TIMOTHY D. GASPERSON, ET AL

CECILY ANN HART

KEVIN S. KNOWLAND

DEBBIE M. MELTON

GAIL L. GREENHILL

MARGARET M. BARLOW

STANLEY J. ARKIN, ET AL

ELIZABETH M. HARWOOD

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

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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 13 OF 97

WETLAND & STREAM IMPACTS

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

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

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

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 (66" RCP)

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL LLLL

TEMP. IMPACTS IN SURFACE WATER

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

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

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

UPSTREAM CHANNEL IMPROVEMENTS SEE DETAIL LLLL

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

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

BEGIN WALL GUTTER 918+25.00 RT. –WBL–

BEGIN SBG STA. 922+50.00 LT. –WBL–

END WALL GUTTER 923+75.00 RT. –WBL–

CONSTRUCT 2GI-H BEHIND RETAINING WALL – SEE DETAIL U

REMOVE 22 LF 18" CSP

EBL 915

EBL 920

WBL 915

WBL 920

TIMOTHY D. GASPERSON, ET AL

CECILY ANN HART

STANLEY J. ARKIN, ET AL

ROBERT SPINO, JR. & KRISTIE K. SPINO

DAPHNE O. OWENBY

DYLAN D. SKIDMORE

KEVIN S. KNOWLAND

DEBBIE M. MELTON

GAIL L. GREENHILL

MARGARET M. BARLOW

SUSAN L. & ELIZABETH M. HARWOOD

AUDREY CRAIG

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

11/29/2018
I-4700A_HYD_PRM_PSH_10.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	10
	R/W SHEET NO.	I-4700A - 21
	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

24" CSP

RETAIN/LINE W/APPROVED LINER

66" WELDED STEEL PIPE 0.875" WALL THICKNESS TRENCHLESS INSTALLATION

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

18" RCP-IV

IMPACTS IN SURFACE WATER (66" RCP)

66" RCP-IV

RETAIN

JB W/MH

GTD

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 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 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

66" WELDED STEEL PIPE 0.875" WALL THICKNESS TRENCHLESS INSTALLATION

RETAINLINE W/APPROVED LINER

24" CSP

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

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

GTD

IMPACTS IN SURFACE WATER (66" RCP)

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'

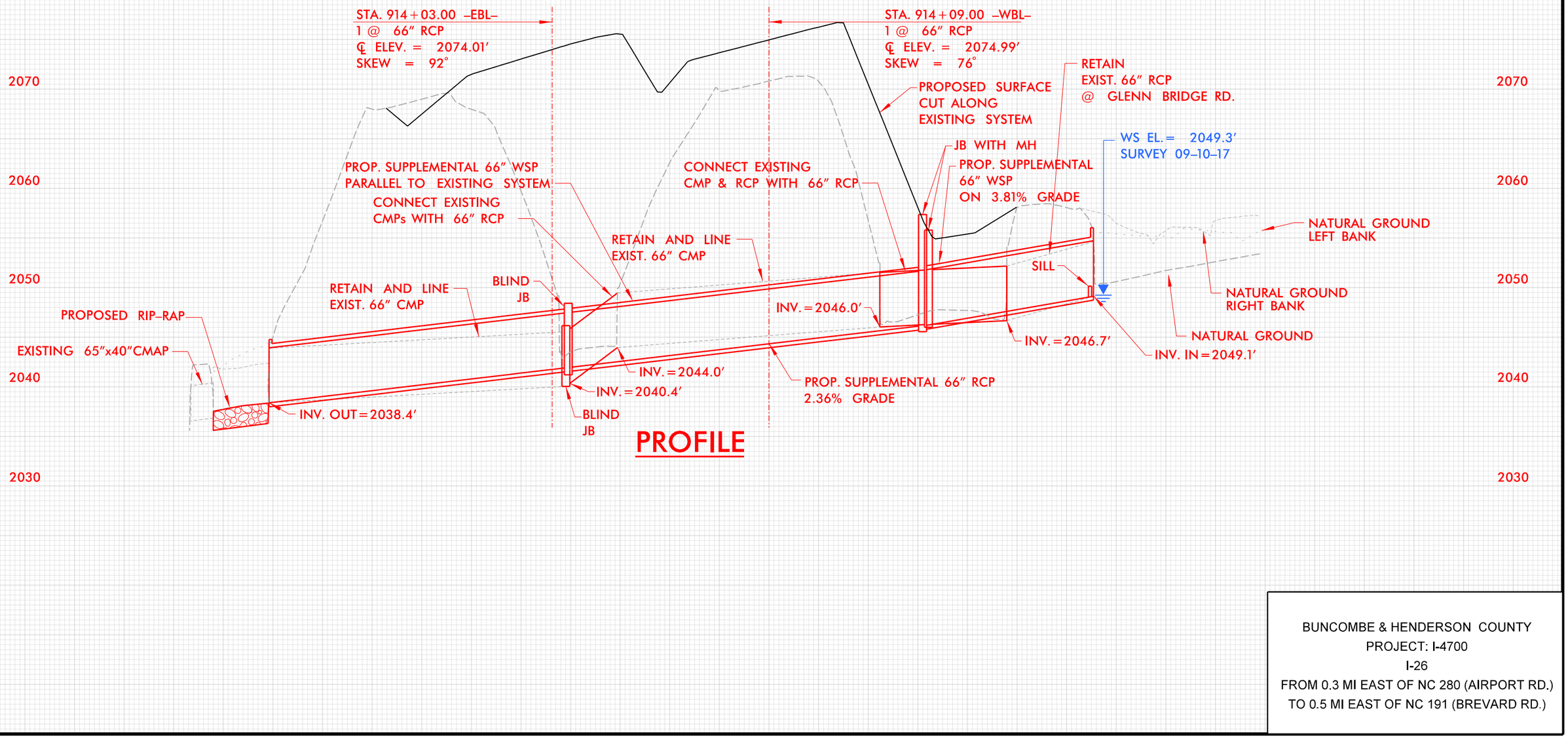
GRAPHIC SCALE

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

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

NAD 83/NA 2011

PERMIT DRAWING SHEET 17 OF 97

WETLAND & STREAM IMPACTS

LEGEND

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

MATCHLINE SHEET 10 –EBL– STA 923+74.50

MATCHLINE SHEET 10 –WBL– STA 924+00.00

MATCHLINE SHEET 12 –EBL– STA 936+67.20

MATCHLINE SHEET 12 –WBL– STA 937+00.00

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

CECILY ANN HART

KENT T. & JIMI G. MOTTINGER

PROGRESS ENERGY CAROLINAS, INC.

DUKE ENERGY PROGRESS, INC.

ANTHONY J. & SHANNON D. PISANO DB 4267 PG 191

LORI C. & JAMES M. BLANKENSHIP

CAROLINA POWER & LIGHT COMPANY D/B/A PROGRESS ENERGY CAROLINAS, INC.

SITE 9 | SDF

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL RRRR

CLASS 'I' RIPRAP EST. 26 TONS EST. 37 SYGF

SITE 11 | WBV

PIPE NOT BURIED

54" RCP-IV

JB W/MH

18" RCP-IV

BEGIN SBG STA. 931+00.00 LT. –EBL–

IMPACTS IN SURFACE WATER (54" RCP)

IMPACTS IN SURFACE WATER (54" CSP)

BLIND JB

REMOVE HW

SITE 8 | SDF

15" RCP-IV

TB2GI-B SG

54" RCP-IV

TBJB W/MH

MECHANIZED CLEARING IN WETLAND

PLUG & FILL W/ FLOWABLE MATERIAL

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

PROP. SHOULDER BERM GUTTER

2GI-B FG

2GI-B SG

END SBG STA. 932+25.00 RT. –WBL–

BEGIN SBG STA. 925+60.00 RT. –WBL–

OTCB-4

SPEC. LAT. 'V' DITCH SEE DETAIL GG

SPEC. LAT. 'V' DITCH SEE DETAIL V

BERM DITCH SEE DETAIL B EST. 95 SY CFM

FS-1

REMOVE HW & 14' OF EX. 54" RCP

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

SPEC. LAT. 'V' DITCH SEE DETAIL X

BERM DITCH SEE DETAIL D

CLASS 'B' RIPRAP EST. 16 TONS EST. 35 SYGF

TAPERED INLET W/HW – SEE SPECIAL DETAIL

FILL IN WETLAND

SPEC. CUT DITCH SEE DETAIL X EST. 55 TONS EST. 80 SYGF

SITE 7 | SDF

SITE 10 | WBR

EXCAVATION IN WETLAND

MECHANIZED CLEARING IN WETLAND

TEMP. IMPACTS IN SURFACE WATER

SEE PERMIT DRAWING SHEET 21

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

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

5/13/2019
I-4700A_HYD_PRM_PSH_11.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	11
R/W SHEET NO.	I-4700A-22
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83/NA 2011

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
- DENOTES FILL IN WETLAND

MATCHLINE SHEET 10 –EBL– STA 923+74.50

MATCHLINE SHEET 10 –WBL– STA 924+00.00

MATCHLINE SHEET 12 –EBL– STA 936+67.20

MATCHLINE SHEET 12 –WBL– STA 937+00.00

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

CECILY ANN HART | KENT T. & JIMI G. MOTTINGER | PROGRESS ENERGY CAROLINAS, INC. | DUKE ENERGY PROGRESS, INC. | ANTHONY J. & SHANNON D. PISANO DB 4267 PG 191 | LORI G. & JAMES M. BLANKENSHIP | CAROLINA POWER & LIGHT COMPANY D/B/A PROGRESS ENERGY CAROLINAS, INC.

SITE 9 | SDF

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL RRRR

CLASS 'I' RIPRAP EST. 26 TONS EST. 37 SYCF

SITE 11 | WBV

PIPE NOT BURIED

54" RCP-IV | JB W/MH | 18" RCP-IV | BEGIN SBG STA. 931+00.00 LT. –EBL–

IMPACTS IN SURFACE WATER (54" RCP)

IMPACTS IN SURFACE WATER (54" CSP)

– EBL –

BLIND JB | REMOVE HW | RETAIN

SITE 8 | SDF

8" RCP-IV | TB2GI-B SG | 54" RCP-IV | TBJB W/ MH | 15" RCP-IV | FS-2 | 15" RCP-IV | 2GI-B FG

MECHANIZED CLEARING IN WETLAND

PLUG & FILL W/ FLOWABLE MATERIAL | 50:1 FDPS TRANSITION FROM 14'-0" AT STA. 925+43 TO 14'-4" AT STA. 925+60 | PROP. SHOULDER BERM GUTTER

– WBL –

18" RCP-IV | REMOVE HW | OTCB-4 | 15" RCP-IV | 2GI-B FG | BEGIN SBG STA. 925+60.00 RT. –WBL– | SPEC. LAT. 'V' DITCH SEE DETAIL GG | SPEC. LAT. 'V' DITCH SEE DETAIL V

2GI-B SG | 15" RCP-IV | 2GI-B FG | END SBG STA. 932+25.00 RT. –WBL– | BLIND JB | FS-1 | REMOVE HW & 14' OF EX. 54" RCP | 54" RCP-IV | CLASS 'B' RIPRAP EST. 2 TONS EST. 7 SYGF

SPEC. LAT. 'V' DITCH SEE DETAIL X | BERM DITCH SEE DETAIL D | CLASS 'B' RIPRAP EST. 16 TONS EST. 35 SYGF | TAPERED INLET W/HW – SEE SPECIAL DETAIL

BERM DITCH SEE DETAIL B EST. 95 SY CFM

SITE 7 | SDF

FILL IN WETLAND

SPEC. CUT DITCH SEE DETAIL X EST. 55 TONS EST. 80 SYGF

EXCAVATION IN WETLAND

SITE 10 | WBR

MECHANIZED CLEARING IN WETLAND

RETAIN

SEE PERMIT DRAWING SHEET 21

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

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

5/13/2019
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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

NAD 83

PERMIT DRAWING SHEET 19 OF 97

SITE 9 SDF

TEMP. IMPACTS IN SURFACE WATER

CLASS 'I' RIPRAP EST. 26 TONS EST. 37 SYGF

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL RRRR

PIPE NOT BURIED

54" RCP-IV

IMPACTS IN SURFACE WATER (54" RCP)

18" RCP-IV

SBG STA. .00 LT. -EBL

JB W/MH

INV=2041.48'

MONITORING WELL

SHOULDER DRAIN

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

18" RCP-IV

54" RCP

RETAIN

BLIND JB

REMOVE HW

HW INV=2043.88'

SITE 8 SDF

15" RCP-IV

IMPACTS IN SURFACE WATER (54" CSP)

54" RCP-IV TBJB W/MH

INV=2048.20'

PROP. SHOULDER BERM GUTTER

SHOULDER DRAIN OUTLET

15" RCP-IV

2GI-B FG

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

RETAIN

2GI-B FG

END SBG STA. 932+25.00 RT. -WBL-

CP-IV

BLIND JB

REMOVE HW & 14' OF EX. 54" RCP

54" RCP-IV

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 'B' RIPRAP EST. 16 TONS EST. 35 SYGF

TAPERED INLET W/HW - SEE SPECIAL DETAIL

TEMP. IMPACTS IN SURFACE WATER

SITE 7 SDF

HW INV=2056.01'

INV=2056.72'

30" HDPE

50' 0' 50' 100' 150'

GRAPHIC SCALE

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.
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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 20 OF 97

NAD 83

SITE 9 SDF

TEMP. IMPACTS IN SURFACE WATER

CLASS 'I' RIPRAP
EST. 26 TONS
EST. 37 SYGF

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL RRRR

PIPE NOT BURIED

54" RCP-IV

IMPACTS IN SURFACE WATER (54" RCP)

18" RCP-IV

SBG STA. .00 LT. -EBL

JB W/MH

18" RCP-IV

RETAIN

BLIND JB

REMOVE HW

SITE 8 SDF

15" RCP-IV

IMPACTS IN SURFACE WATER (54" CSP)

54" RCP-IV
TBJB W/MH

PROP. SHOULDER BERM GUTTER

15" RCP-IV

2GI-B FG

RETAIN

2GI-B FG

END SBG STA.
932+25.00 RT. -WBL-

CP-IV

BLIND JB

2GI-B SG

REMOVE HW & 14' OF EX. 54" RCP

54" RCP-IV

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 'B' RIPRAP
EST. 16 TONS
EST. 35 SYGF

SITE 7 SDF

TAPERED INLET W/HW - SEE SPECIAL DETAIL

TEMP. IMPACTS IN SURFACE WATER

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

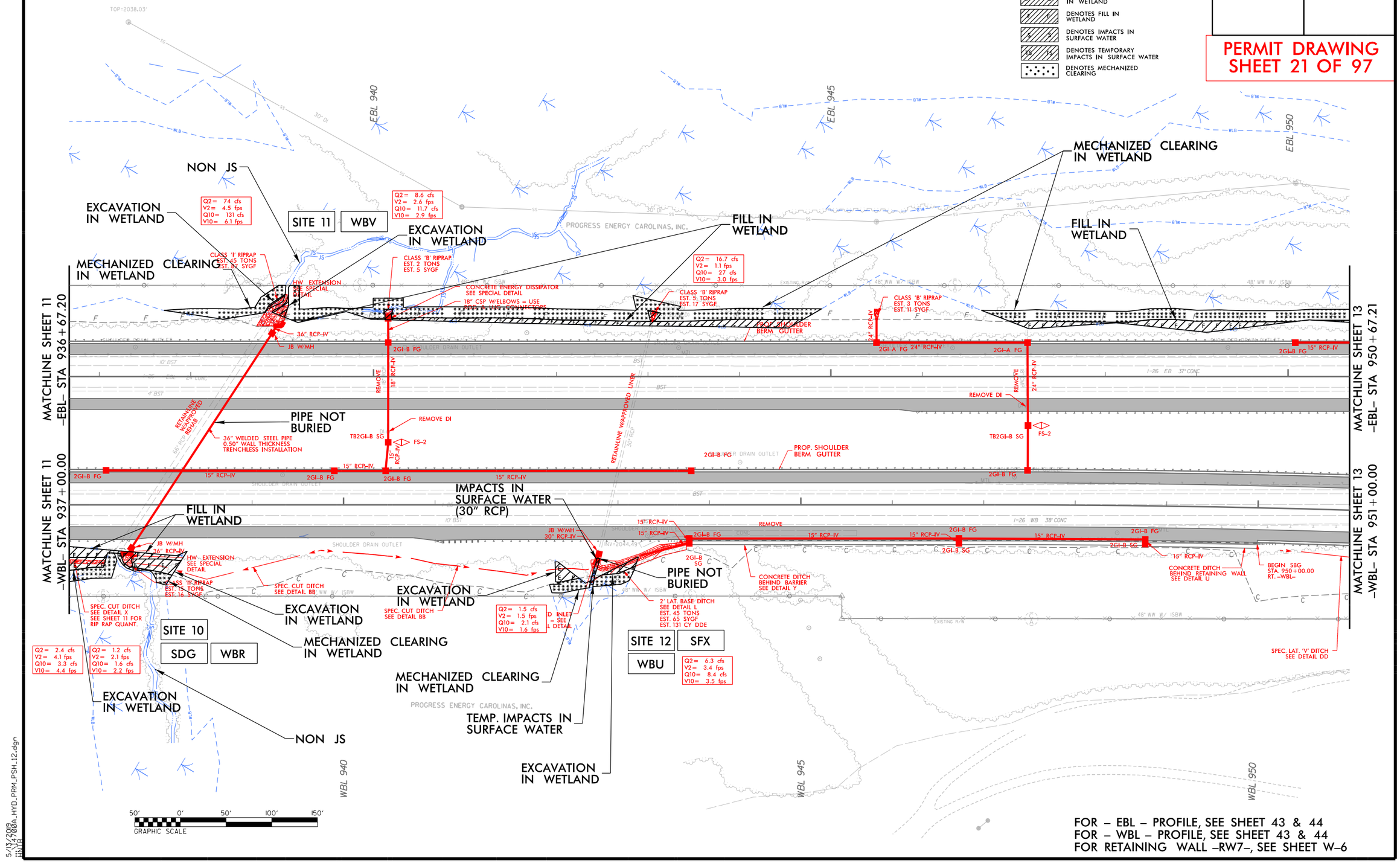
PERMIT DRAWING
SHEET 21 OF 97

WETLAND & STREAM IMPACTS

NAD 83/NA 2011

LEGEND

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



FOR – EBL – PROFILE, SEE SHEET 43 & 44
FOR – WBL – PROFILE, SEE SHEET 43 & 44
FOR RETAINING WALL –RW7–, SEE SHEET W–6

5/13/2019
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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	12
R/W SHEET NO.	I-4700A-23
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 22 OF 97

WETLAND & STREAM IMPACTS

NAD 83/NA 2011

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.

NON JS

EXCAVATION IN WETLAND

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

SITE 11 | WBV

CLASS 'I' RIPRAP
EST. 45 TONS
EST. 67 SYGF

MECHANIZED CLEARING IN WETLAND

HW EXTENSION SEE SPECIAL DETAIL

36" RCP-IV

JB W/MH

2GI-B FG

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

EXCAVATION IN WETLAND

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

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

18" CSP W/ELBOWS – USE AS REQUIRED TO AVOID UTILITIES

18" RCP-IV

REMOVE

REMOVE DI

TB2GI-B SG

FS-2

15" RCP-IV

PIPE NOT BURIED

36" WELDED STEEL PIPE
0.50" WALL THICKNESS
TRENCHLESS INSTALLATION

RETAINLINE WARPROVED REHAB

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

PROP. SHOULDER BERM GUTTER

2GI-B FG

15" RCP-IV

RETAINLINE WARPROVED LINER

MECHANIZED CLEARING IN WETLAND

FILL IN WETLAND

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

24" RCP-IV

2GI-A FG 24" RCP-IV

2GI-A FG

REMOVE DI

REMOVE

24" RCP-IV

TB2GI-B SG

FS-2

2GI-B FG 15" RCP-IV

IMPACTS IN SURFACE WATER (30" RCP)

JB W/MH

30" RCP-IV

15" RCP-IV

REMOVE

2GI-B FG

2GI-B SG

PIPE NOT BURIED

CONCRETE DITCH BEHIND BARRIER SEE DETAIL Y

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

BEGIN SBG STA. 950+00.00 RT. –WBL–

CONCRETE DITCH BEHIND RETAINING WALL SEE DETAIL U

SPEC. LAT. 'V' DITCH SEE DETAIL DD

SPEC. CUT DITCH SEE DETAIL BB

SPEC. CUT DITCH SEE DETAIL X
SEE SHEET 11 FOR RIP RAP QUANT.

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

SITE 10 | SDG | WBR

EXCAVATION IN WETLAND

MECHANIZED CLEARING IN WETLAND

NON JS

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

SITE 12 | SFX | WBU

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

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

FOR – EBL – PROFILE, SEE SHEET 43 & 44
FOR – WBL – PROFILE, SEE SHEET 43 & 44
FOR RETAINING WALL –RW7–, SEE SHEET W–6

5/13/2019
I-4700A_HYD_PRM_PSH_12.dgn
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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 & 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

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

FILL IN WETLAND

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

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

HW

SPEC. CUT DITCH
SEE DETAIL BB

48" WW W/ ISBW

SPEC. CUT DITCH
SEE DETAIL X
EST. 80 SYGF

SITE 10

SDG | WBR

EXCAVATION IN WETLAND

MECHANIZED CLEARING IN WETLAND

MECHANIZED CLEARING IN WETLAND

TEMP. IMPACTS IN SURFACE WATER

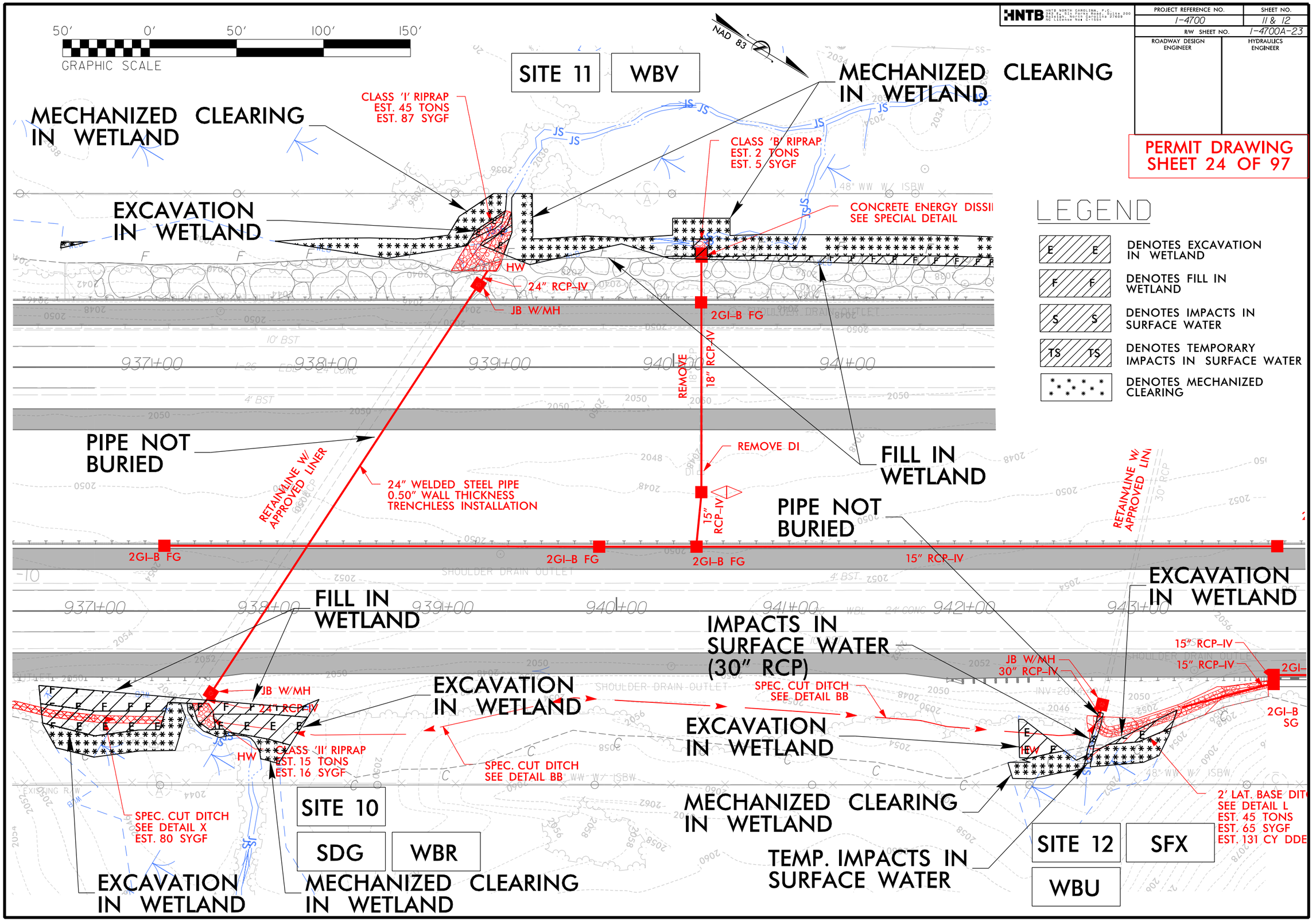
SITE 12 | SFX

WBU

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

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 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

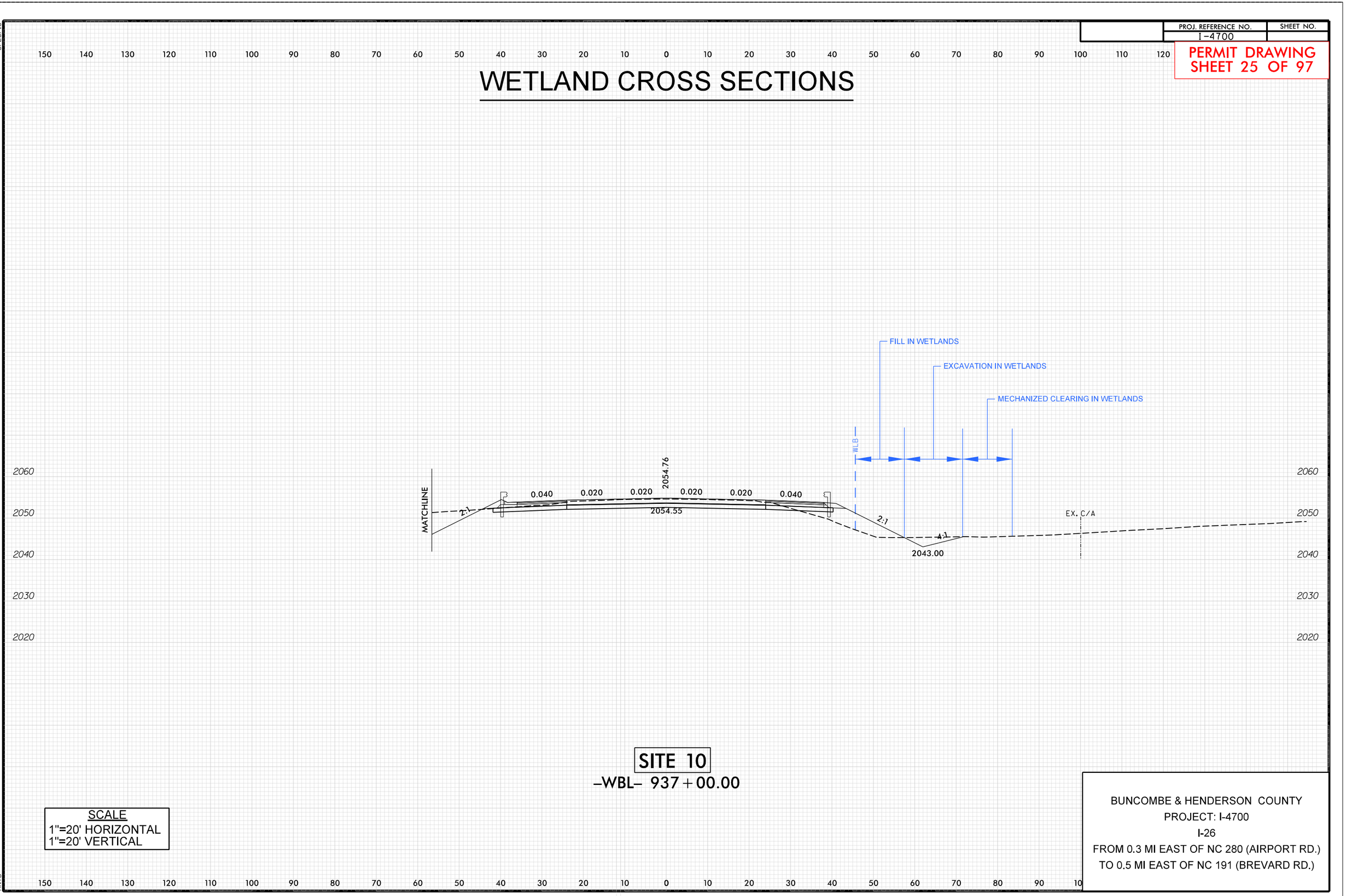
PERMIT DRAWING
SHEET 24 OF 97

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.)

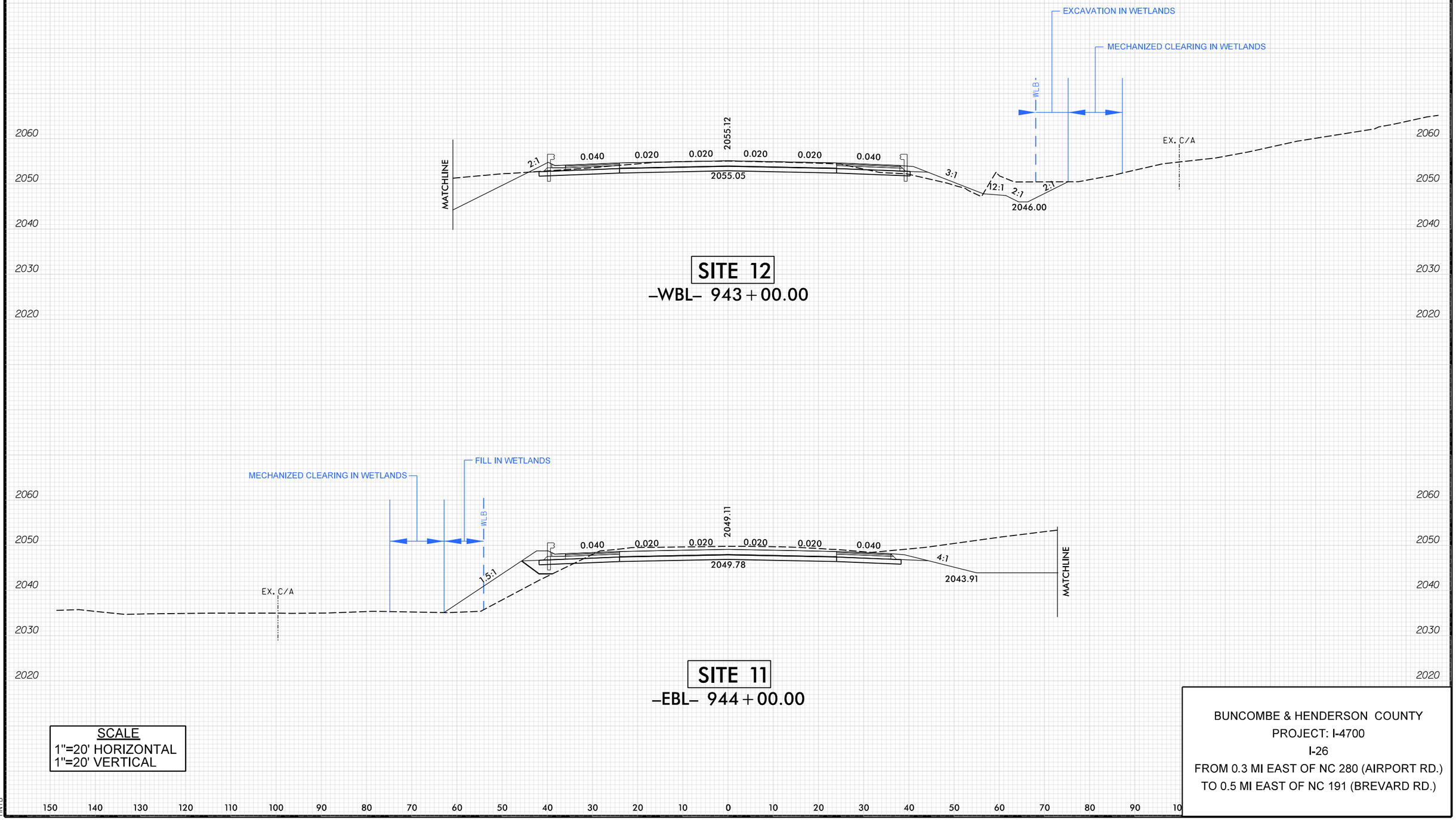
11/30/2016
I-4700A_HYD_PRM_PSH_XPL
HNTB

6/23/16

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

PERMIT DRAWING
SHEET 26 OF 97

WETLAND CROSS SECTIONS



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	

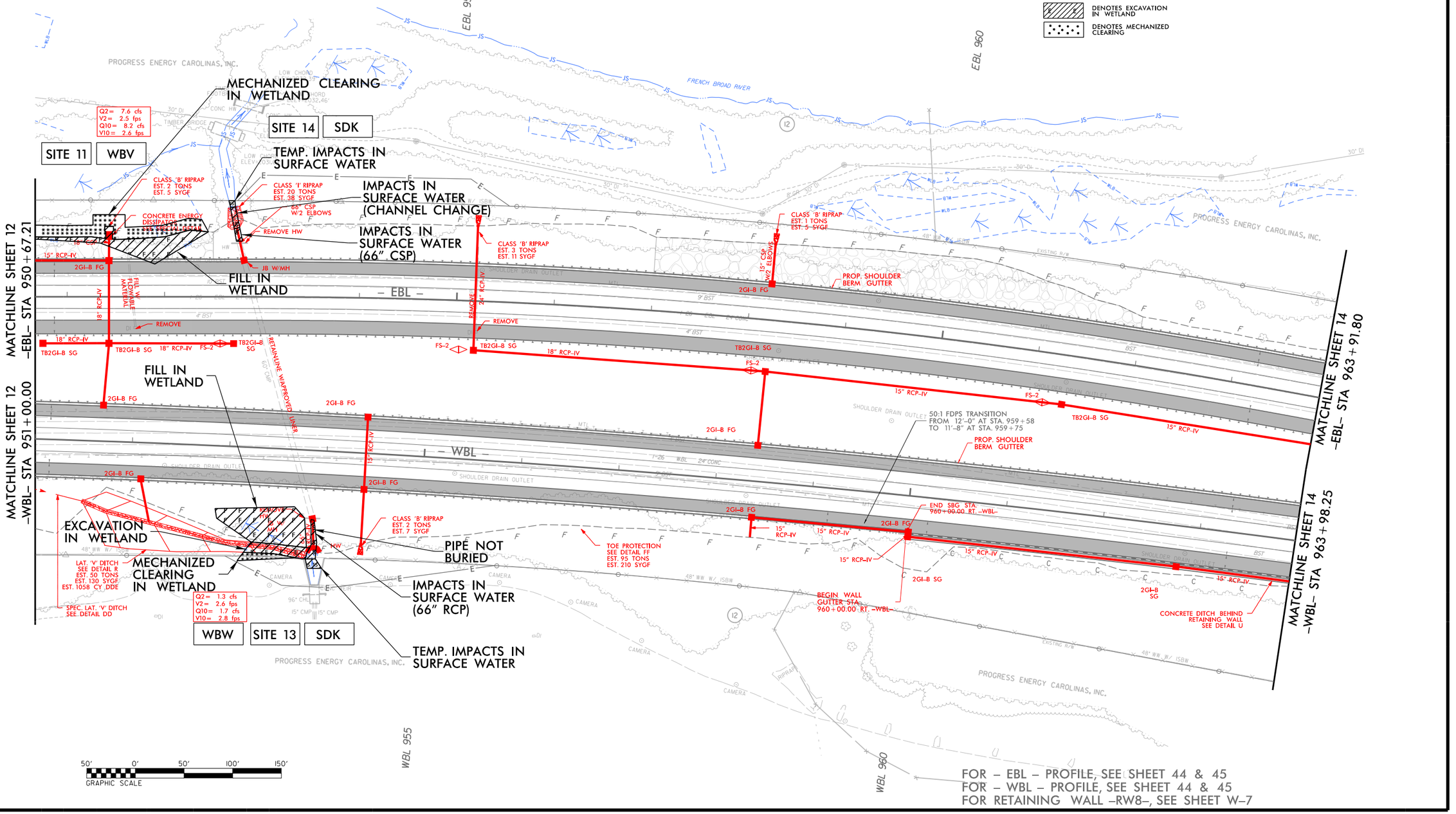
NAD 83

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:\347008_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

SITE 11 WBV

SITE 14 SDK

WBW SITE 13 SDK

MECHANIZED CLEARING IN WETLAND

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

IMPACTS IN SURFACE WATER (66" CSP)

FILL IN WETLAND

EXCAVATION IN WETLAND

MECHANIZED CLEARING IN WETLAND

IMPACTS IN SURFACE WATER (66" RCP)

PIPE NOT BURIED

TEMP. IMPACTS IN SURFACE WATER

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

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

15" RCP-IV

18" RCP-IV

24" RCP-IV

2GI-8 FG

TB2GI-B SG

FS-2

REMOVE

FILL WITHIN WETLAND MATERIALS

RETAINING WATERPROOF LINER

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

SPEC. LAT. 'V' DITCH SEE DETAIL DD

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

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–

CONCRETE DITCH BEHIND RETAINING WALL SEE DETAIL U

2GI-B SG

PROGRESS ENERGY CAROLINAS, INC.

EBL 955

EBL 960

WBL 955

WBL 960

FRENCH BROAD RIVER

– EBL –

– WBL –

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

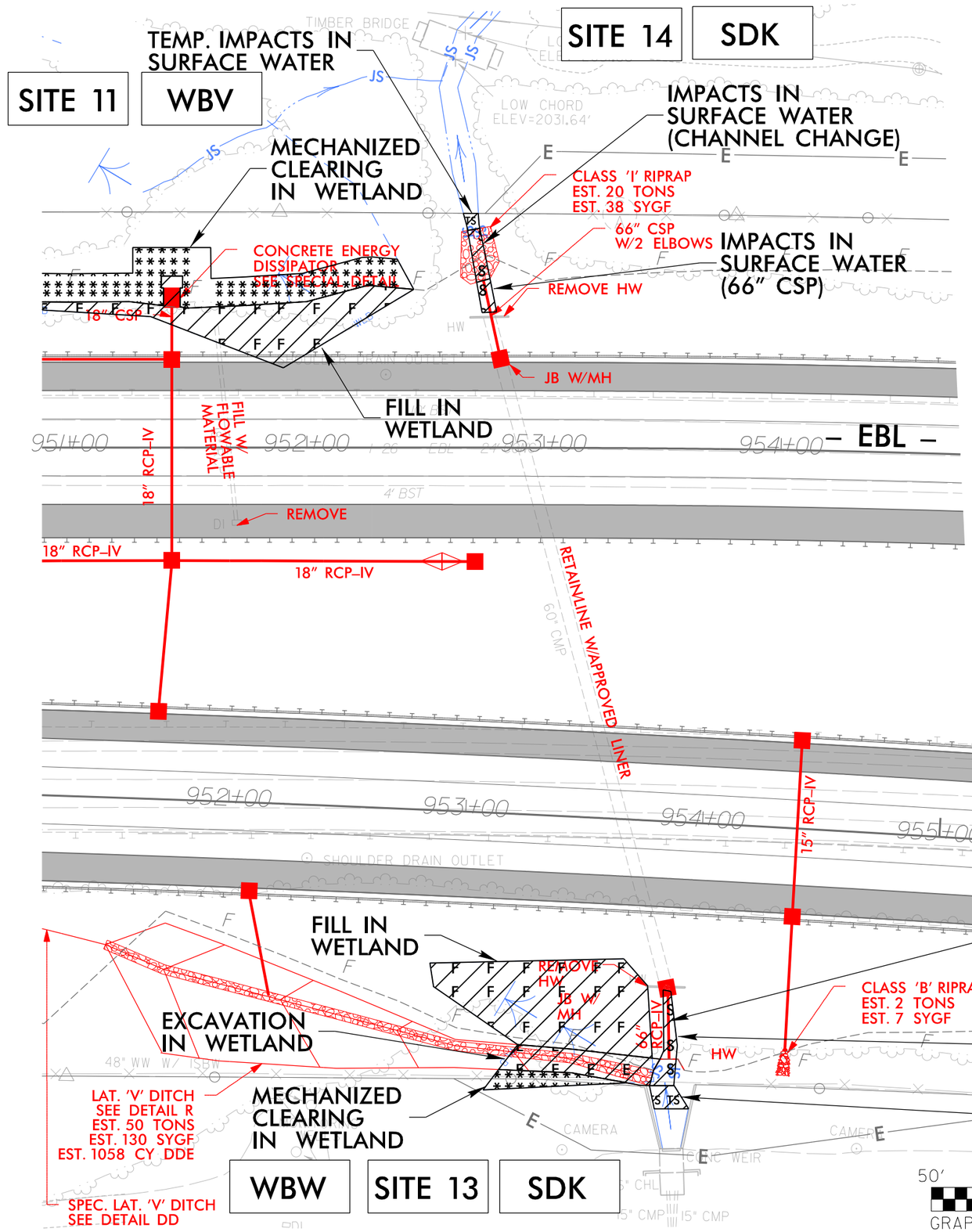
FOR – EBL – PROFILE, SEE SHEET 44 & 45
FOR – WBL – PROFILE, SEE SHEET 44 & 45
FOR RETAINING WALL –RW8–, SEE SHEET W–7

11/30/2018
I:\347008_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



LEGEND

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

HNTB NORTH CAROLINA, P.C.
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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

SITE 11 | WBV

SITE 14 | SDK

TEMP. IMPACTS IN SURFACE WATER

MECHANIZED CLEARING IN WETLAND

CONCRETE ENERGY DISSIPATOR ELEV=2032.00

18" CSP

FILL IN WETLAND

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

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

66" CSP W/2 ELBOWS

REMOVE HW

IMPACTS IN SURFACE WATER (66" CSP)

JB W/MH

18" RCP–IV

FILL W/ FLOWABLE MATERIAL

REMOVE

18" RCP–IV

18" RCP–IV

RETAINLINE W/APPROVED LINER

15" RCP–IV

– EBL –

951+00 952+00 953+00 954+00 955+00

FILL IN WETLAND

REMOVE HW

JB W/ MH

8" RCP–IV

PIPE NOT BURIED

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

IMPACTS IN SURFACE WATER (66" RCP)

HW

EXCAVATION IN WETLAND

MECHANIZED CLEARING IN WETLAND

TEMP. IMPACTS IN SURFACE WATER

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

SPEC. LAT. 'V' DITCH
SEE DETAIL DD

WBW | SITE 13 | SDK

LEGEND

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

50' 0' 50' 100' 150'

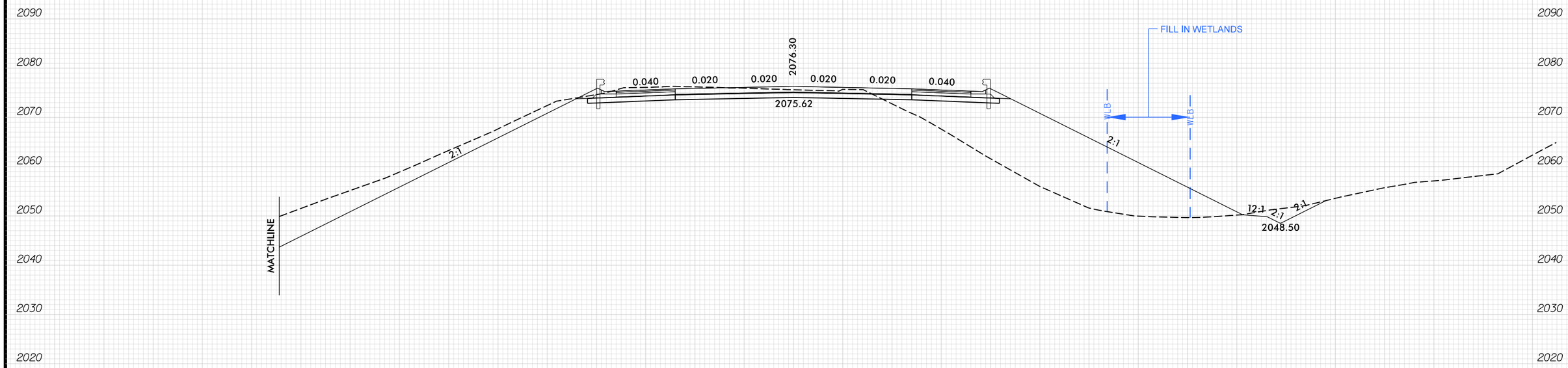
GRAPHIC SCALE

6/23/16

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

PERMIT DRAWING
SHEET 31 OF 97

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

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

66" CONC. COLLAR

NATURAL GROUND LEFT BANK

INV. = 2042.1'

INV. = 2041.4'

EXTEND 66" CSP 2.53% GRADE

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.)

11/3/2018
I-4700A_HYD_PRM_PSH_13C_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	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 | WBL 980 | WBL 985 | WBL 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

HICKLIN HILL, LLC

HOPE W. RYAN

FOOTBRIDGE

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

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

FILL W/ FLOWABLE MATERIAL

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

15" RCP-IV

REMOVE

RETAIN

END SBG STA. 980+00.00 LT. –WBL–

END SBG STA. 989+00.00 LT. –EBL–

END SBG STA. 986+00.00 RT. –WBL–

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

RETAINING WALL APPROVED LINER

EXTEND 2@ 10' X 10' RCBC

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

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

36" RCP-IV

JB W/MH

HW

BERM DITCH SEE DETAIL B EST. 100 SYGF

PROP. GATE

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

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

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

SITE 16 SDN

SITE 15 SDN

POWELL CREEK

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

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

FILL W/ FLOWABLE MATERIAL

2GI-B FG

TB2GI-B FG

2GI-B SG

15" RCP-IV

REMOVE

RETAIN

END SBG STA. 980+00.00 LT. –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

PROP. GATE

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

UPSTREAM CHANNEL IMPROVEMENTS SEE DETAIL JJJJ

DOWNSTREAM CHANNEL IMPROVEMENTS

EXTEND 2@ 10' X 10' RCBC

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–

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

SPEC. LAT. 'V' DITCH SEE DETAIL GG

JB W/MH

36" RCP-IV

HW

BERM DITCH SEE DETAIL B EST. 100 SYGF

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

11/30/2018
3147008A_HYD_PRM_PSH_15.dgn
HNTB

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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)

RIVERLINK, INC.

EXISTING R/W

2GI-B FG

REMOVE

15" RCP-IV

RETAIN

2GI-B SG

TB2GI-B FG

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

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

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

END SBG STA. 986+00.00 RT. –WBL–

CULVERT NOT BURIED

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

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL JJJJ

PROP. GATE

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

REMOVE

15" RCP-IV

RETAIN

2GI-B SG

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

TB2GI-B FG

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

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL JJJJ

PROP. GATE

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

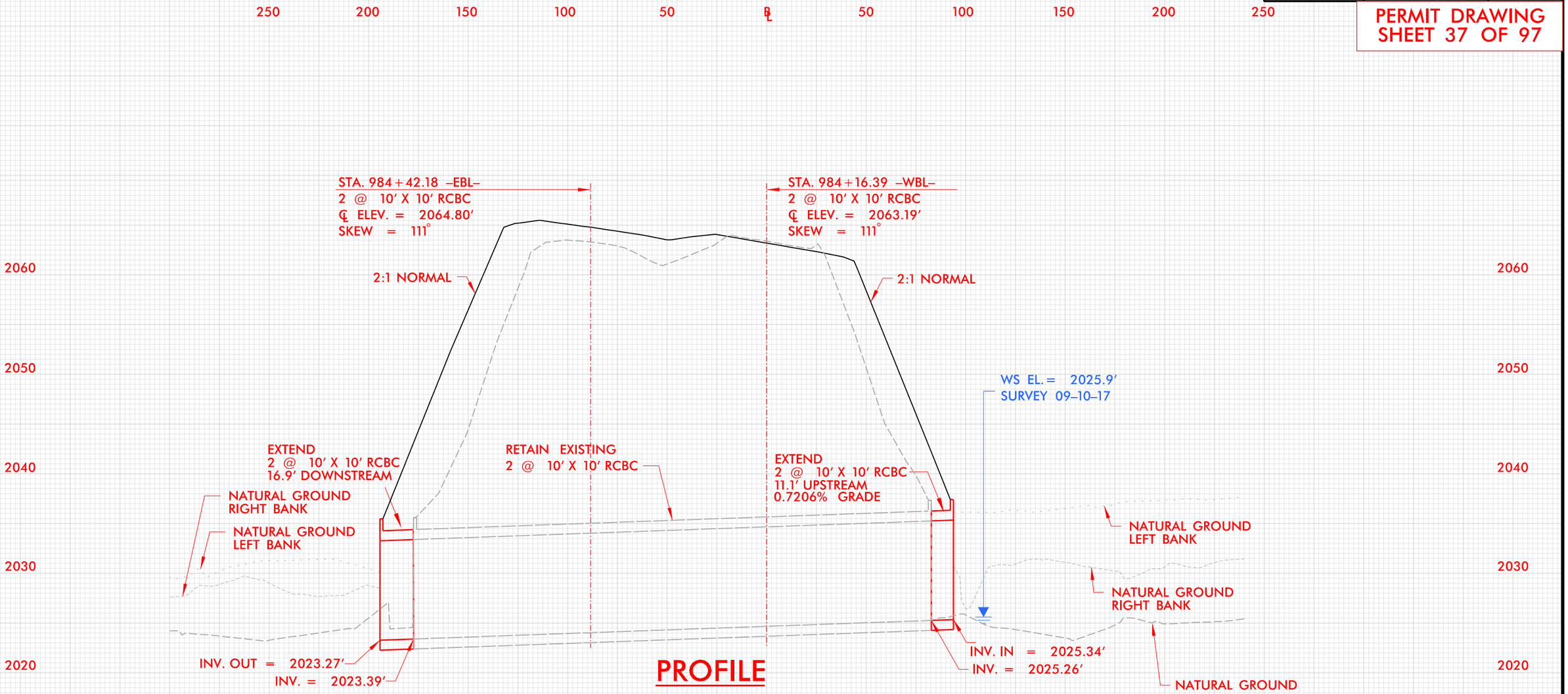
50' 0' 50' 100' 150'

GRAPHIC SCALE

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

NAD 83

WETLAND & STREAM IMPACTS

PERMIT DRAWING SHEET 38 OF 97

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)

THE AVENTINE ASHEVILLE, LLC

BILTMORE FARMS, LLC

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

S 36° 34' 14.1" E

N 44° 30' 32.3" W

S 63° 48' 54.5" E

MATCHLINE SHEET 17 -L- STA 1017+00.00

MATCHLINE SHEET 19 -L- STA 1029+00.00

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

PERMIT DRAWING
SHEET 39 OF 97

WETLAND & STREAM IMPACTS

NAD 83

LEGEND

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

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)

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.

STATE OF NORTH CAROLINA CONSERVATION EASEMENT

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

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

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 40 OF 97

SITE 18 — SDU

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

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

PIPE NOT BURIED

48" RCP–IV
JB W/MH

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

15" RCP–IV

REMOVE

RETAIN

RETAINING WALL UNAPPROVED LINER

15" RCP–IV

REMOVE

REMOVE

REMOVE

REMOVE

REMOVE

15" RCP–IV

BEGIN SBG STA.
1026+50.00 RT. –L–

TOE PROTECTION
SEE DETAIL QQ
EST. 30 SYGF

IMPACTS IN SURFACE WATER (48" RCP)

PIPE NOT BURIED

REMOVE HW

BLIND JB
48" RCP–IV

IMPACTS IN SURFACE WATER (BANK STABILIZATION)
SEE DETAIL LLLL

HW

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

BLIND JB

HW

TEMP. IMPACTS IN SURFACE WATER

SITE 17 — SDU

CHANNEL IMPROVEMENTS
SEE DETAIL LLLL

LEGEND

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

50′ 0′ 50′ 100′ 150′
GRAPHIC SCALE

11/30/2018
J:\4700A_HYD_PRM_PSH_18A.dgn
HNTB

8/17/99

HNTB NORTH CAROLINA, P.C. 343 W. 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

SITE 18 | SDU

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

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

PIPE NOT BURIED

48" RCP-IV
JB W/MH

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

15" RCP-IV

REMOVE

RETAIN

RETAINING WALL UNAPPROVED LINER

15" RCP-IV

REMOVE

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

TOE PROTECTION
SEE DETAIL QQ
EST. 30 SYGF

BLIND JB

IMPACTS IN SURFACE WATER (48" RCP)

PIPE NOT BURIED

REMOVE HW

BLIND JB
48" RCP-IV

IMPACTS IN SURFACE WATER (BANK STABILIZATION)
SEE DETAIL LLLL

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

TEMP. IMPACTS IN SURFACE WATER

SITE 17 | SDU

CHANNEL IMPROVEMENTS
SEE DETAIL LLLL

LEGEND

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

50' 0' 50' 100' 150'

GRAPHIC SCALE

11/30/2018
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

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

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

PROP. SHOULDER BERM GUTTER

REMOVE

TB2GI-B FG

TB2GI-A FG

2GI-B FG

2GI-B SG

15" RCP-IV

18" RCP-IV

24" RCP-IV

24" CSP

18" CSP W/1 ELBOW

END SBG STA. 1033+00.00 LT. –L–

BDO

FS-3

BILTMORE FARMS, INC.

BILTMORE FARMS, LLC

48" WW W/ ISRW

I-26 EBL 10' BST

I-26 WBL 24" CONC

I-26 WB BST

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

FOR – L – PROFILE, SEE SHEET 49

12/3/2018
I:\I4700A_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

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

REMOVE PROP. SHOULDER BERM GUTTER

END SBG STA. 1033+00.00 LT. –L–

BILTMORE FARMS, INC.

BILTMORE FARMS, LLC

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

FOR – L – PROFILE, SEE SHEET 49

12/3/2008
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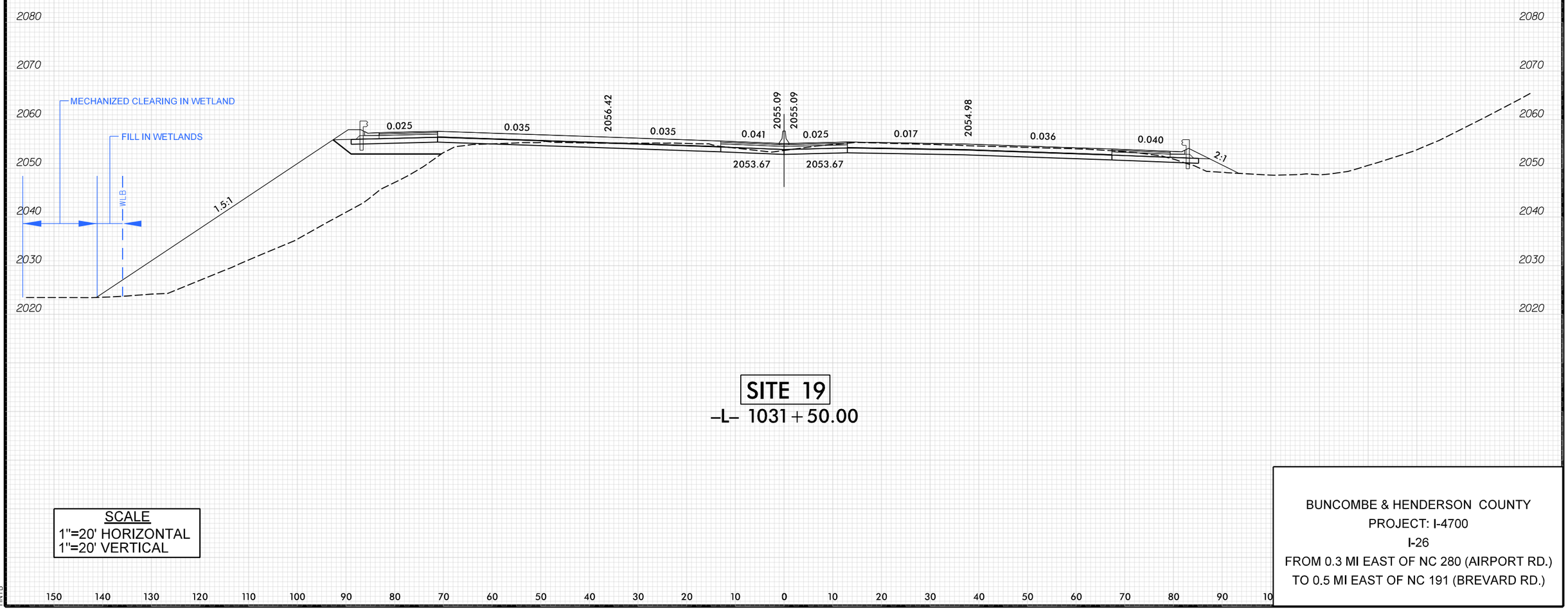
HNTB

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/NA 2011

WETLAND & STREAM IMPACTS

PERMIT DRAWING SHEET 45 OF 97

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

Q2= 200 cfs
V2= 4.8 fps
Q10= 260 cfs
V10= 5.2 fps

BILTMORE FARMS, INC.

SITE 22 WCH

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

CONCRETE ENERGY DISSIPATOR
SEE SPECIAL DETAIL

CLASS 'I' RIPRAP
EST. 21 TONS
EST. 29 SYGF

42" RCP-IV

BLIND JB

BEGIN SBG STA. 1044+25.00 LT. -L-

PLUG & FILL W/ FLOWABLE MATERIAL

RETAINLINE LINER PROVIDED

42" WELDED STEEL PIPE
0.625" WALL THICKNESS
TRENCHLESS INSTALLATION

REMOVE HW

SPEC LAT. 'V' DITCH
SEE DETAIL RR
EST. 20 TONS
EST. 40 SYGF

15" RCP-IV

2GI-B FG

TB2GI-B FG

REMOVE

BERM DITCH
SEE DETAIL SS
SEE SHEET 19 FOR CFM QUANT.
SPEC LAT. 'V' DITCH
SEE DETAIL RR
EST. 45 TONS
EST. 90 SYGF

MATCHLINE SHEET 19
-L- STA 1042+00.00

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

BERM DITCH
SEE DETAIL SS
EST. 40 SY CFM

BERM DITCH
SEE DETAIL SS
EST. 45 SY CFM

PIPE NOT BURIED

15" CSP W/ ELBOWS - USE ROD & LUG CONNECTORS

2' LAT. BASE DITCH
SEE DETAIL JJ
EST. 105 TONS
EST. 145 SYGF
EST. 259 CY DDE

IMPACTS IN SURFACE WATER (60" CMP/RCP)

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

BILTMORE FARMS, INC.

SITE 21 SDW

PIPE NOT BURIED

BLIND JB
60" RCP-IV

REMOVE HW

END SBG STA. 1049+64.39 LT. -L-

END SBG STA. 1049+64.00 RT. -L-

TAPERED INLET W/HW - SEE SPECIAL DETAIL

CLASS 'I' RIPRAP
EST. 23 TONS
EST. 25 SYGF

TEMP. IMPACTS IN SURFACE WATER

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

BEGIN SBG STA. 1051+73.00 LT. -L-

REMOVE

2GI-B FG

EXPRESSWAY CURB & GUTTER

BEGIN SBG STA. 1051+72.97 RT. -L-

TB2GI-B FG

2' LAT. BASE DITCH
SEE DETAIL YY
EST. 160 SYGF
EST. 350 CY DDE

TIE 2' BASE DITCH INTO EXIST. DITCH

MATCHLINE SHEET 21
-L- STA 1055+00.00

1045 1050 1055

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

5/13/2019
34700A_HYD_PRM_PSH_20.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	20
R/W SHEET NO.	I-4700A-30
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83/NA 2011

WETLAND & STREAM IMPACTS

PERMIT DRAWING SHEET 46 OF 97

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

Q2= 200 cfs
V2= 4.8 fps
Q10= 260 cfs
V10= 5.2 fps

BILTMORE FARMS, INC.

SITE 22 | WCH

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

CONCRETE ENERGY DISSIPATOR
SEE SPECIAL DETAIL

CLASS 'I' RIPRAP
EST. 35 TONS
EST. 35 SYGF

BEGIN SBG STA.
1044+25.00 LT. –L–

CLASS 'I' RIPRAP
EST. 21 TONS
EST. 29 SYGF

42" RCP-IV

BLIND JB

PLUG & FILL W/ FLOWABLE MATERIAL

15" RCP-IV

2GI-B FG

REMOVE

END SBG STA.
1049+66.39 LT. –L–

EXPRESSWAY CURB & GUTTER

I-26 EB 37 BST

TB2GI-B FG

RETAINING WALL PROVIDED LINER

42" WELDED STEEL PIPE
0.625" WALL THICKNESS
TRENCHLESS INSTALLATION

REMOVE HW

SPEC. LAT. 'V' DITCH
SEE DETAIL RR
EST. 20 TONS
EST. 40 SYGF

BERM DITCH
SEE DETAIL SS
EST. 40 SY CFM

BERM DITCH
SEE DETAIL SS
SEE SHEET 19 FOR CFM QUANT.
SPEC. LAT. 'V' DITCH
SEE DETAIL RR
EST. 65 TONS
EST. 90 SYGF

MATCHLINE SHEET 19
–L– STA 1042+00.00

PIPE NOT BURIED

15" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

2' LAT. BASE DITCH
SEE DETAIL JJ
EST. 105 TONS
EST. 145 SYGF
EST. 259 CY DDE

BLIND JB
60" RCP-IV

REMOVE HW

TAPERED INLET W/HW – SEE SPECIAL DETAIL

CLASS 'I' RIPRAP
EST. 23 TONS
EST. 25 SYGF

END SBG STA.
1049+64.00 RT. –L–

BEGIN SBG STA.
1051+73.00 LT. –L–

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

BEGIN SBG STA.
1051+72.97 RT. –L–

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

TIE 2' BASE DITCH INTO EXIST. DITCH

2' LAT. BASE DITCH
SEE DETAIL YY
EST. 160 SYGF
EST. 350 CY DDE

MATCHLINE SHEET 21
–L– STA 1055+00.00

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

IMPACTS IN SURFACE WATER (60" CMP/RCP)

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL RR

SITE 20 | SDV

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

SITE 21 | SDW

BILTMORE FARMS, INC.

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

5/13/2019
I-4700A_HYD_PRM_PSH_20.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	20
RW SHEET NO.	I-4700A-30
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 47 OF 97

LEGEND

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

NAD 83

SITE 20 SDV

MECHANIZED CLEARING IN WETLAND

PIPE NOT BURIED

BLIND JB
42" RCP-IV
SPEC. LAT. 'V' DITCH
SEE DETAIL RR
EST. 30 TONS
EST. 40 SYGF
TB2GI-B
2GI-B
15" RCP-IV
BLIND J
HW SEE SPECIAL DETAIL
BERM DITCH
SEE DETAIL SS
SEE SHEET 19 FOR CFM QUANT.

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

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

SITE 22 WCH

CLASS 'I' RIPRAP
EST. 25 TONS
EST. 35 SYGF

EXCAVATION IN WETLAND

REMOVE

PLUG & FILL W/ FLOWABLE MATERIAL

15" RCP-IV

END SBG STA. 1049+64.39 LT. -L-

EXPRESSWAY CURB & GUTTER

I-26 EB 37' BST

REMOVE

1047+00 1048+00 1049+00 1050+00

REMOVE

I-26 WB 37' BST
EXPRESSWAY CURB & GUTTER

RETAINLINE WAPPROVED LINER

15" RCP-IV

PIPE NOT BURIED

BLIND JB
60" RCP-IV

REMOVE HW

REMOVE

END S
1049+

2' LAT. BASE DITCH
SEE DETAIL JJ
EST. 105 TONS
EST. 145 SYGF
EST. 259 CY DDE

CLASS 'I' RIPRAP
EST. 23 TONS
EST. 32 SYGF

IMPACTS IN SURFACE WATER (60" CMP/RCP)

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

TEMP. IMPACTS IN SURFACE WATER

SITE 21 SDW

HNTB NORTH CAROLINA, P.C.
343 Ex. 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

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

MECHANIZED CLEARING IN WETLAND

PIPE NOT BURIED

BLIND JB
42" RCP-IV
SPEC. LAT. 'V' DITCH
SEE DETAIL RR
EST. 30 TONS
EST. 40 SYGF
TB2GI-B
2GI-B
15" RCP-IV
BLIND J
HW SEE SPECIAL DETAIL
BERM DITCH
SEE DETAIL SS
SEE SHEET 19 FOR CFM QUANT.

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

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

SITE 22 | WCH

CLASS 'I' RIPRAP
EST. 25 TONS
EST. 35 SYGF

EXCAVATION IN WETLAND

REMOVE
PLUG & FILL W/ FLOWABLE MATERIAL
15" RCP-IV

END SBG STA. 1049+64.39 LT. -L-

EXPRESSWAY CURB & GUTTER
I-26 EB 37' BST
REMOVE

1047+00 1048+00 1049+00 1050+00

REMOVE
I-26 WB 37' BST
EXPRESSWAY CURB & GUTTER
RETAINING WALL APPROVED LINER
15" RCP-IV

PIPE NOT BURIED

2' LAT. BASE DITCH
SEE DETAIL JJ
EST. 105 TONS
EST. 145 SYGF
EST. 259 CY DDE

REMOVE
BLIND JB
60" RCP-IV
REMOVE HW
END S
1049+

IMPACTS IN SURFACE WATER (60" CMP/RCP)

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

TEMP. IMPACTS IN SURFACE WATER

CLASS 'I' RIPRAP
EST. 23 TONS
EST. 32 SYGF

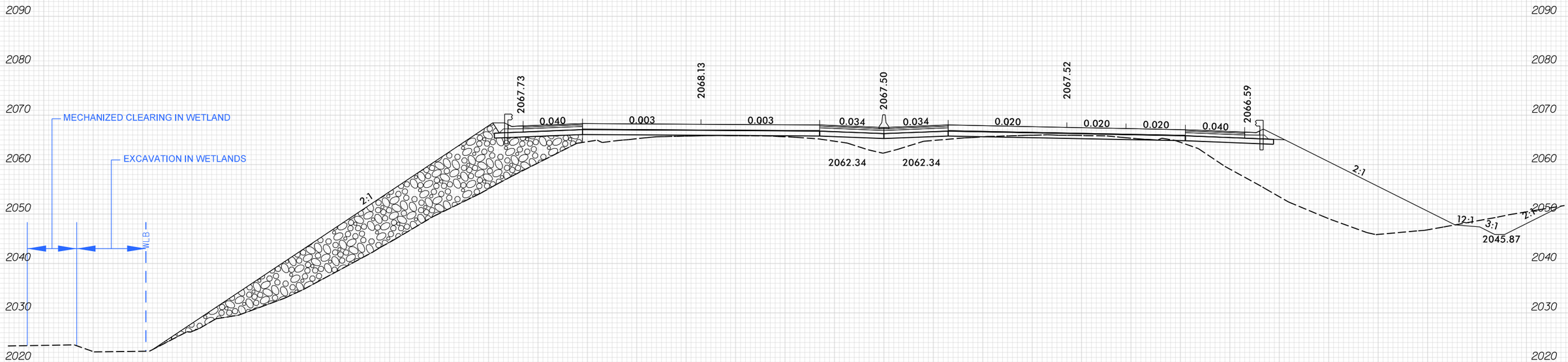
SITE 21 | SDW

6/23/16

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

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	23
RW SHEET NO.	I-4700B-33
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

WETLAND & STREAM IMPACTS

NAD 83/NA 2011

PERMIT DRAWING SHEET 50 OF 97

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

MATCHLINE SHEET 22 –WBL– STA 1082+00.00

MATCHLINE SHEET 22 –EBL– STA 1082+01.78

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, LLC

BILTMORE FARMS, INC.

SITE 24 SDX

SITE 23 SDX

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

IMPACTS IN SURFACE WATER (42" RCP)

TEMP. IMPACTS IN SURFACE WATER

END WALL GUTTER 1084+50.00 LT –EBL–

CONCRETE DITCH BEHIND RETAINING WALL SEE DETAIL U

CLASS 'B' RIPRAP EST. 10 TONS EST. 21 SYGF

2' SPEC. LAT. BASE DITCH SEE DETAIL FFF EST. 32 CY DDE

CLASS 'B' RIPRAP EST. 11 TONS EST. 24 SYGF

SINGLE FACED CONCRETE BARRIER

BEGIN WALL GUTTER 1086+00.00 LT –EBL–

END SHLD TRANSITION BEGIN SBG STA. 1084+38.51 RT –EBL–

30" WELDED STEEL PIPE 0.50" WALL THICKNESS TRENCHLESS INSTALLATION BURY 0.5' BOTH ENDS

PLUG & FILL W/ FLOWABLE FILL MATERIAL

REMOVE 15" RCP-IV

15" RCP-IV

30" RCP-IV

36" RCP-IV

SPEC. LAT. 'V' DITCH SEE DETAIL GGG

LATERAL 'V' DITCH SEE DETAIL EEEE

LATERAL 'V' DITCH SEE DETAIL JJJ EST. 175 TONS EST. 245 SYGF EST. 1218 CY DDE

TIE LAT. 'V' DITCH INTO EXIST. JS

END SBG STA. 1089+00.00 RT –EBL–

BEGIN SBG STA. 1088+50.00 LT –WBL–

CONCRETE DITCH BEHIND RETAINING WALL SEE DETAIL U

CLASS 'B' RIPRAP EST. 14 TONS EST. 30 SYGF

TOE PROTECTION SEE DETAIL LLL EST. 185 TONS EST. 260 SYGF

END WALL GUTTER BEGIN SBG 1093+00.00 LT –EBL–

END SBG STA. 1094+75.00 LT –EBL–

BEGIN SBG 1094+00.00 RT –EBL–

15" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

CLASS 'I' RIPRAP EST. 39 TONS EST. 55 SYGF

PROP. SHOULDER BERM GUTTER

RETAINLINE (WAPPROVED UNEQ.)

36" CSP W/ELBOWS – USE ROD & LUG CONNECTORS

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

CLASS 'B' RIPRAP EST. 2 TONS EST. 4 SYGF

TAPERED INLET W/HW – SEE SPECIAL DETAIL

42" RCP-IV

BLIND JB

REMOVE HW

TOE PROTECTION SEE DETAIL LLL EST. 120 TONS EST. 165 SYGF

END SBG BEGIN WALL GUTTER 1093+89.00 RT –WBL–

CONCRETE DITCH BEHIND RETAINING 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

5/13/2018
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HNTB

7/19/2017

WETLAND & STREAM IMPACTS

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
RW SHEET NO.	I-4700B-33
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83/NA 2011

PERMIT DRAWING SHEET 51 OF 97

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

MATCHLINE SHEET 22 –WBL– STA 1082+00.00

MATCHLINE SHEET 22 –EBL– STA 1082+01.78

MATCHLINE SHEET 24 –WBL– STA 1095+00.00

MATCHLINE SHEET 24 –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.

–EBL–

–WBL–

SITE 24 SDX

SITE 23 SDX

TEMP. IMPACTS IN SURFACE WATER

CLASS 'B' RIPRAP EST. 14 TONS EST. 30 SYGF

TOE PROTECTION SEE DETAIL LLL EST. 185 TONS EST. 260 SYGF

END WALL GUTTER BEGIN SBG 1093+00.00 LT –EBL–

END SBG STA. 1094+75.00 LT –EBL–

CONCRETE DITCH BEHIND RETAINING WALL SEE DETAIL U

CLASS 'B' RIPRAP EST. 10 TONS EST. 21 SYGF

2' SPEC. LAT. BASE DITCH SEE DETAIL FFF EST. 32 CY DDE

CLASS 'B' RIPRAP EST. 11 TONS EST. 24 SYGF

SINGLE FACED CONCRETE BARRIER

BEGIN WALL GUTTER 1086+00.00 LT –EBL–

END WALL GUTTER 1084+50.00 LT –EBL–

END SHLD TRANSITION BEGIN SBG STA. 1084+38.51 RT –EBL–

30" WELDED STEEL PIPE 0.50" WALL THICKNESS TRENCHLESS INSTALLATION BURY 0.5' BOTH ENDS

PLUG & FILL W/ REMOVABLE MATERIAL

REMOVE 15" RCP-IV

15" RCP-IV

30" RCP-IV

36" RCP-IV

SPEC. LAT. 'V' DITCH SEE DETAIL GGG

BEGIN SBG STA. 1088+50.00 LT –WBL–

END SBG STA. 1089+00.00 RT –EBL–

GREU TL-3

TYPE B-77

LATERAL 'V' DITCH SEE DETAIL EEEE

LATERAL 'V' DITCH SEE DETAIL JJJ EST. 175 TONS EST. 245 SYGF EST. 1218 CY DDE

TIE LAT. 'V' DITCH INTO EXIST. JS

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

36" CSP W/ELBOWS – USE ROD & LUG CONNECTORS

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

CLASS 'B' RIPRAP EST. 2 TONS EST. 4 SYGF

TAPERED INLET W/HW – SEE SPECIAL DETAIL

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

PROP. SHOULDER BERM GUTTER

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

CLASS 'I' RIPRAP EST. 39 TONS EST. 55 SYGF

RETAINLINE (WAPPROVED UNEQ.)

BEGIN SBG 1094+00.00 RT –EBL–

15" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

42" RCP-IV

BLIND JB

HW

REMOVE HW

TOE PROTECTION SEE DETAIL LLL EST. 120 TONS EST. 165 SYGF

CONCRETE DITCH BEHIND RETAINING WALL SEE DETAIL U

END SBG BEGIN WALL GUTTER 1093+89.00 RT –WBL–

IMPACTS IN SURFACE WATER (42" 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

5/13/2018
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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
R/W SHEET NO.	I-4700B-34
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 52 OF 97

WETLAND & STREAM IMPACTS

NAD 83 / NA 2011

LEGEND

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

MATCHLINE SHEET 23 –EBL– STA 1095+43.86

MATCHLINE SHEET 23 –WBL– STA 1095+00.00

MATCHLINE SHEET 25 –EBL– STA 1109+13.21

MATCHLINE SHEET 25 –WBL– STA 1108+00.00

TEMP. IMPACTS IN SURFACE WATER

SITE 25 SEU

PLUG & FILL W/FLOWABLE MATERIAL

IMPACTS IN SURFACE WATER (30" WSP/RCP)

TOE PROTECTION SEE DETAIL LLL SEE SHEET 23 FOR RIPRAP QUANT

36" RCP-IV

BLIND JB

PIPE BURIED

15" RCP-IV

SINGLE FACED CONCRETE BARRIER WITH MOMENT SLAB

50:1 FDPS TRANSITION FROM 11'-8" AT STA. 1102+50 TO 12'-0" AT STA. 1102+67

BEGIN SBG STA. 1102+25.00 LT –EBL–

TYPE B-77

PROP. SHOULDER BERM GUTTER

2' LAT. BASE DITCH SEE DETAIL NNN EST. 463 CY DDE

2' LAT. BASE DITCH SEE DETAIL MMM EST. 40 TONS EST. 55 SYGF EST. 250 CY DDE

30" RCP-IV

BLIND JB

BERM DITCH SEE DETAIL SS 105 SY CFM

RETAIN-LINE W/APPROVED LINER

REMOVE

18" RCP-IV

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

36" WELDED STEEL PIPE 0.50" WALL THICKNESS TRENCHLESS INSTALLATION BURY 0.5' BOTH ENDS

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

SITE 26 SDX

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

STANDARD BASE DITCH SEE DETAIL W EST. 63 CY DDE S = 4.0% V = 3.8 fps D = 0.6 ft

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

SITE 24A SDX

TEMP. IMPACTS IN SURFACE WATER

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

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

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

SITE 28 SDY

24" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

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. 7 TONS EST. 15 SYGF

RETAIN-LINE W/APPROVED LINER

PROP. SHOULDER BERM GUTTER

CONCRETE DITCH BEHIND RETAINING WALL SEE DETAIL U

SINGLE FACED CONCRETE BARRIER PROP. RETAINING WALL –RW15–

END WALL GUTTER BEGIN SBG 1100+50.00 RT –WBL–

24" RCP-IV

50:1 FDPS TRANSITION FROM 11'-8" AT STA. 1100+75 TO 12'-0" AT STA. 1100+92

TOE PROTECTION SEE DETAIL LLL 45 TONS 65 SYGF

BLIND JB

24" CSP

EXCAVATION IN WETLAND

SDY

SITE 27 WCV

Q2= 0.3 cfs
V2= 0.5 fps
Q10= 0.5 cfs
V10= 0.7 fps

IMPACTS IN SURFACE WATER (30" CMP/RCP)

STANDARD BASE DITCH SEE DETAIL PPP

SPEC. LAT. 'V' DITCH SEE DETAIL OOO EST. 104 CY DDE

TEMP. IMPACTS IN SURFACE WATER

–EBL– 1100

–EBL– 1105

–WBL– 1095

–WBL– 1100

–WBL– 1105

WBL

–EBL–

20 BILTMORE FARMS, LLC

BILTMORE FARMS, INC.

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

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

5/13/2019
I-4700B_HYD_PRM_PSH_24.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
R/W SHEET NO.	I-4700B-34
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 53 OF 97

WETLAND & STREAM IMPACTS

NAD 83 / NA 2011

LEGEND

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

MATCHLINE SHEET 23 –EBL– STA 1095+43.86

MATCHLINE SHEET 23 –WBL– STA 1095+00.00

MATCHLINE SHEET 25 –EBL– STA 1109+13.21

MATCHLINE SHEET 25 –WBL– STA 1108+00.00

TEMP. IMPACTS IN SURFACE WATER
SITE 25 SEU
PLUG & FILL W/FLOWABLE MATERIAL
TOE PROTECTION SEE DETAIL LLL SEE SHEET 23 FOR RIPRAP QUANT
IMPACTS IN SURFACE WATER (30" WSP/RCP)
36" RCP-IV
BLIND JB
PIPE BURIED
15" RCP-IV
REMOVE
36" WELDED STEEL PIPE 0.50" WALL THICKNESS TRENCHLESS INSTALLATION BURY 0.5' BOTH ENDS
IMPACTS IN SURFACE WATER (CHANNEL CHANGE)
CLASS 'I' RIPRAP EST. 15 TONS EST. 30 SYGF
SITE 24A SDX
TEMP. IMPACTS IN SURFACE WATER
PLUG & FILL W/ FLOWABLE MATERIAL
CONCRETE DITCH BEHIND RETAINING WALL SEE DETAIL U
SINGLE FACED CONCRETE BARRIER PROP. RETAINING WALL –RW15–
SINGLE FACED CONCRETE BARRIER WITH MOMENT SLAB
PROP. SHOULDER BERM GUTTER
RETAIN LINE W/APPROVED LINER
50:1 FDPS TRANSITION FROM 11'-8" AT STA. 1102+50 TO 12'-0" AT STA. 1102+67
BEGIN SBG STA 1102+25.00 LT –EBL–
TYPE B-77
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
2' LAT. BASE DITCH SEE DETAIL NNN EST. 463 CY DDE
2' LAT. BASE DITCH SEE DETAIL MMM EST. 40 TONS EST. 55 SYGF EST. 250 CY DDE
BERM DITCH SEE DETAIL SS 105' SY CFM
30" RCP-IV
BLIND JB
IMPACTS IN SURFACE WATER (CHANNEL CHANGE)
18" RCP-IV
CLASS 'I' RIPRAP EST. 11 TONS EST. 22 SYGF
SITE 26 SDX
CLASS 'B' RIPRAP EST. 3 TONS EST. 10 SYGF
STANDARD BASE DITCH SEE DETAIL W EST. 63 CY DDE S = 4.0% V = 3.8 fps D = 0.6 ft
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
TEMP. IMPACTS IN SURFACE WATER
CLASS 'B' RIPRAP EST. 1 TONS EST. 5 SYGF
CLASS 'B' RIPRAP EST. 3 TONS EST. 7 SYGF
CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL
SITE 28 SDY
24" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS
CLASS 'B' RIPRAP EST. 7 TONS EST. 15 SYGF
RETAIN LINE W/APPROVED LINER
IMPACTS IN SURFACE WATER (CHANNEL CHANGE)
24" RCP-IV
TOE PROTECTION SEE DETAIL LLL 45 TONS 65 SYGF
BLIND JB
EXCAVATION IN WETLAND
SDY
SITE 27 WCV
Q2= 0.3 cfs
V2= 0.5 fps
Q10= 0.5 cfs
V10= 0.7 fps
IMPACTS IN SURFACE WATER (30" CMP/RCP)
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

–EBL– 1100
–EBL– 1105
–WBL– 1095
–WBL– 1100
–WBL– 1105

BILTMORE FARMS, LLC
BILTMORE FARMS, INC.

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

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

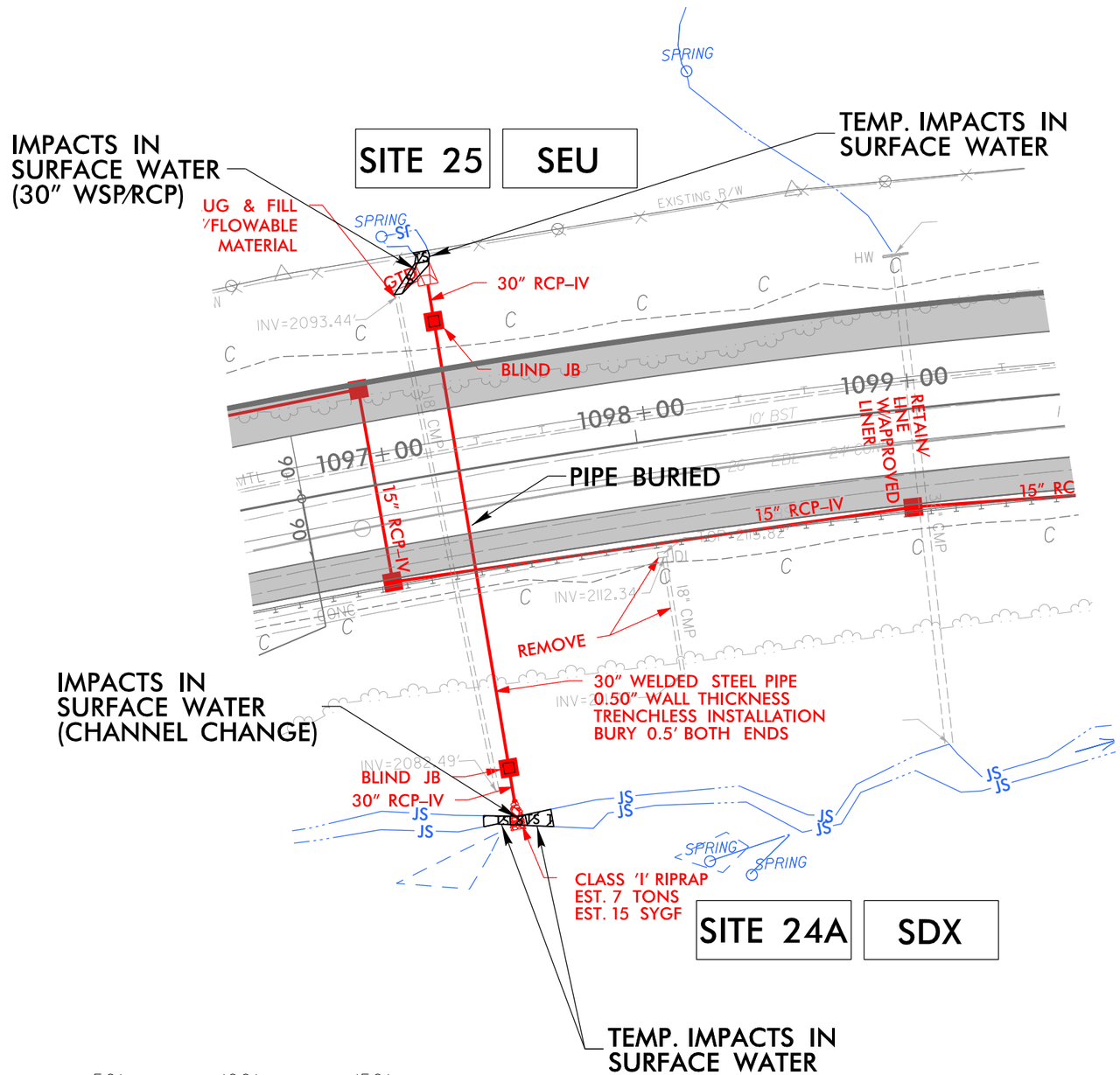
5/14/2018
I-4700B_HYD_PRM_PSH_24.dgn
HNTB

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	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

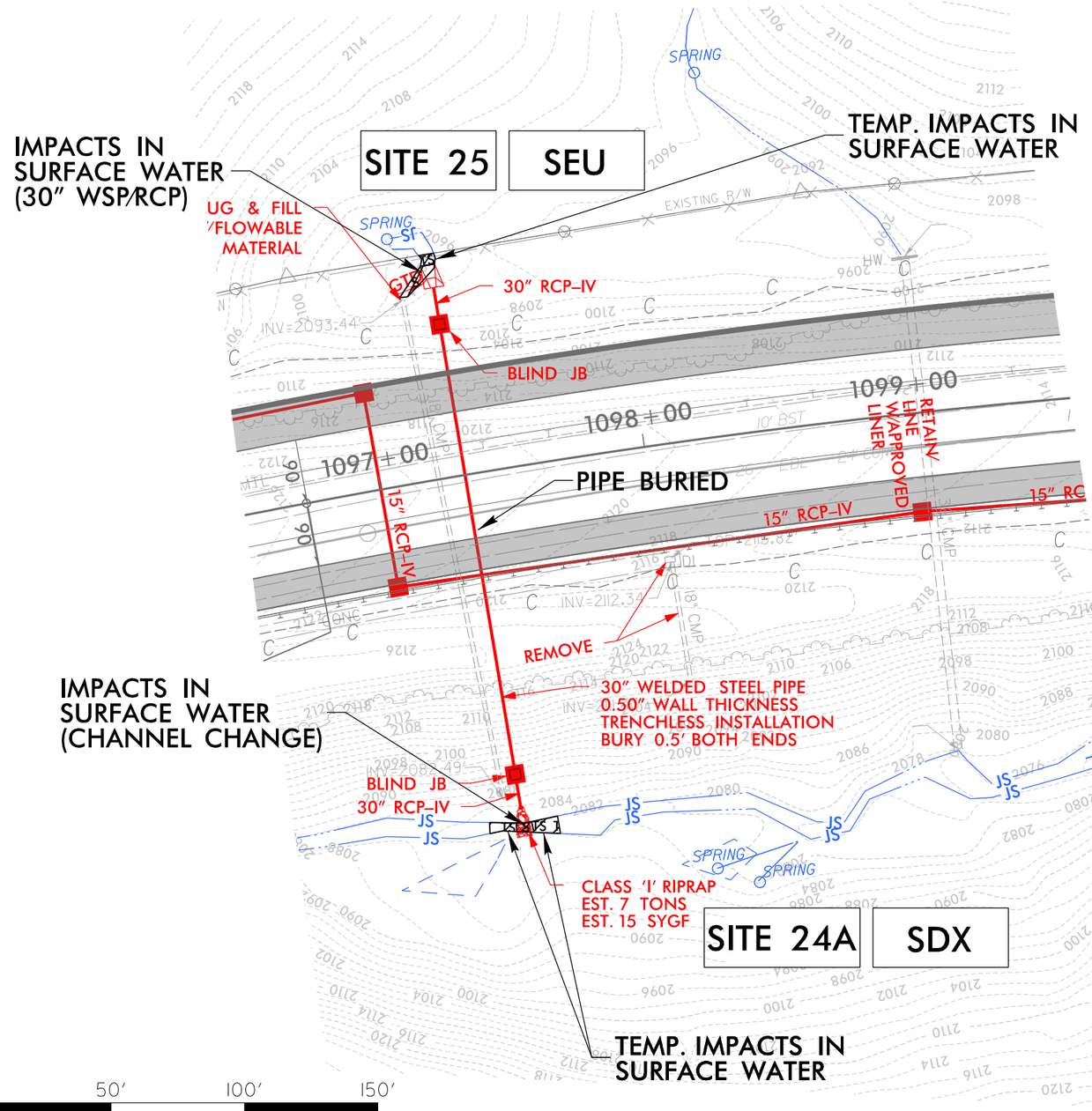
TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER

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 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

PERMIT DRAWING SHEET 56 OF 97

NAD 83

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

SITE 26 | SDX

INV=2055.55'

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

INV=2073.31'

REMOVE

INV=2071.48'

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

15" RCP–

STANDARD BASE DITCH
SEE DETAIL W
EST. 63 CY DDE
S = 4.0%
V = 3.8 fps
D = 0.6 ft

TEMP. IMPACTS IN SURFACE WATER

STANDARD BASE DITCH
SEE DETAIL CC
EST. 57 CY DDE
S = 1.0%
VS= 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

SITE 28 | SDY

REMOVE

24" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

CLASS 'B' RIPRAP
EST. 7 TONS
EST. 15 SYGF

INV=2049.25'

INV=2090.49'

TOP=2093.73'

1104+00

1105+00

1106+00

1107+00

1108+00

RETAIN LINE W/APPROVED LINER

24" RCP–IV

RETAIN LINE W/APPROVED LINER

IV

12' FDPS

48'

42' TYP.

E PROTECTION
E DETAIL LLL
5 TONS
5 SYGF

BLIND JB

INV=2064.86'

EXCAVATION IN WETLAND

30" RCP–IV

IMPACTS IN SURFACE WATER (30" CMP/RCP)

48" WW W/ 2SBW

BLIND JB
24" CSP

SDY

SITE 27 | WCV

SPRING

TEMP. IMPACTS IN SURFACE WATER

STANDARD BASE DITCH
SEE DETAIL PPP

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

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 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

PERMIT DRAWING SHEET 57 OF 97

NAD 83

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

SITE 26 | SDX

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

REMOVE

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

15" RCP-

STANDARD BASE DITCH
SEE DETAIL W
EST. 63 CY DDE
S = 4.0%
V = 3.8 fps
D = 0.6 ft

TEMP. IMPACTS IN SURFACE WATER

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

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

SITE 29 | SDX

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

CONCRETE ENERGY DISSIPATOR
SEE SPECIAL DETAIL

SITE 28 | SDY

REMOVE

24" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

CLASS 'B' RIPRAP
EST. 7 TONS
EST. 15 SYGF

RETAIN LINE W/APPROVED LINER

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

24" RCP-IV

IV

E PROTECTION
E DETAIL LLL
5 TONS
5 SYGF

EXCAVATION IN WETLAND

BLIND JB

30" RCP-IV

IMPACTS IN SURFACE WATER (30" CMP/RCP)

42' TYP.

48" WW W/ 2SBW

TEMP. IMPACTS IN SURFACE WATER

SDY
SITE 27 | WCV

SPRING

BLIND JB
24" CSP

STANDARD BASE DITCH
SEE DETAIL PPP

12' FDPS

48'

LEGEND

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

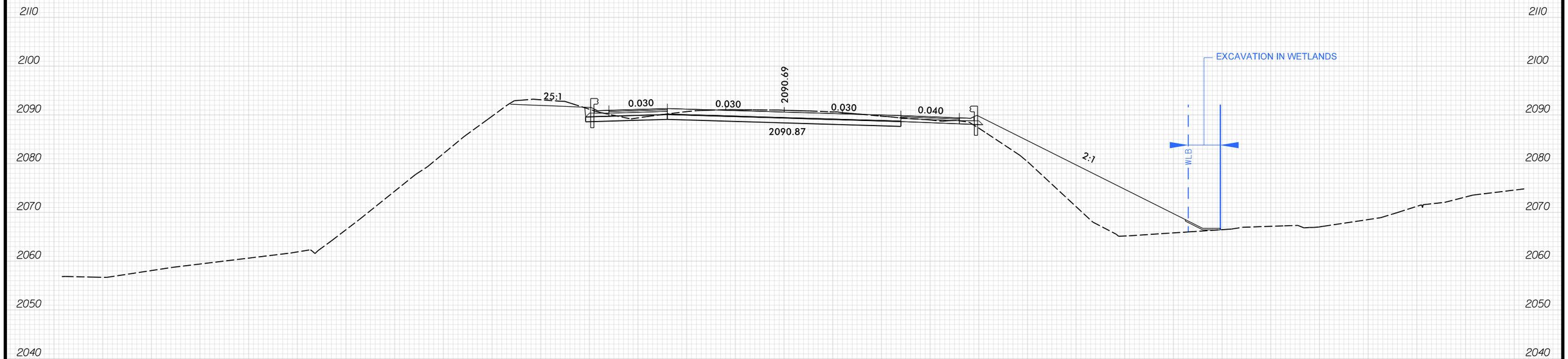
50' 0' 50' 100' 150'
GRAPHIC SCALE

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
R/W SHEET NO.	I-4700B-35
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 59 OF 97

NAD 83 NAD 83/NA 2011

WETLAND & STREAM IMPACTS

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

BILTMORE FARMS, LLC (20)

BILTMORE FARMS, INC.

–EBL– 1110

–EBL– 1115

–EBL– 1120

–WBL– 1110

–WBL– 1115

–WBL– 1120

–EBL–

–WBL–

NON JS

BERM DITCH SEE DETAIL SS 240 SY CFM

BERM DITCH SEE DETAIL D

BERM DITCH SEE DETAIL SS 80 SY CFM

BERM DITCH SEE DETAIL SS 175 SY CFM

BDO

REMOVE

FS–3

15" RCP–IV

18" RCP–IV

24" RCP–IV

30" RCP–IV

30" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

18" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

15" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

24" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

PROP. SHOULDER BERM GUTTER

PLUG & FILL W/ FLOWABLE MATERIAL

SPECIAL LATERAL 'V' DITCH SEE DETAIL OOO

2' SPEC. LAT. BASE DITCH SEE DETAIL FFF EST. 912 CY DDE

4' SPEC. LAT. BASE DITCH SEE DETAIL GGG EST. 95 TONS EST. 135 SYGF

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

CLASS 'B' RIPRAP EST. 6 TONS EST. 13 SYGF

CLASS 'B' RIPRAP EST. 5 TONS EST. 12 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

TOE PROTECTION SEE DETAIL LLL EST. 172 TONS EST. 278 SYGF

BLIND JB 66" RCP–IV

RETAIN LINE WRAPPED OVER LINER

SITE 30 SDX

SITE 31 SDX

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

IMPACTS IN SURFACE WATER (66" RCP)

TEMP. IMPACTS IN SURFACE WATER

PIPE NOT BURIED

LEGEND

DENOTES IMPACTS IN SURFACE WATER

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

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

FOR –WBL– & –EBL– PROFILES, SEE SHEETS 53 & 54

5/13/2019
I-4700B_HYD_PRM_PSH_25.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

NAD 83 NAD 83/NA 2011

PERMIT DRAWING SHEET 60 OF 97

WETLAND & STREAM IMPACTS

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

NON JS

BERM DITCH SEE DETAIL SS 240 SY CFM

BERM DITCH SEE DETAIL D

BERM DITCH SEE DETAIL SS 80 SY CFM

BDO

18" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

REMOVE

24" RCP-IV

15" RCP-IV

30" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

30" RCP-IV

FS-3

TEMP. IMPACTS IN SURFACE WATER

2' SPEC. LAT. BASE DITCH SEE DETAIL FFF EST. 912 CY DDE

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

IMPACTS IN SURFACE WATER (66" RCP)

SITE 30 SDX

SITE 31 SDX

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

CLASS 'B' RIPRAP EST. 6 TONS EST. 13 SYGF

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

15" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

HW

BLIND JB 66" RCP-IV

RETAIN LINE WAPPED LINER REMOVED

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

TEMP. IMPACTS IN SURFACE WATER

CLASS 'B' RIPRAP EST. 5 TONS EST. 12 SYGF

24" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

PROP. SHOULDER BERM GUTTER

PIPE NOT BURIED

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

TOE PROTECTION SEE DETAIL LLL EST. 172 TONS EST. 278 SYGF

PROP. SHOULDER BERM GUTTER

PLUG & FILL W/ FLOWABLE MATERIAL

SPECIAL LATERAL 'V' DITCH SEE DETAIL OOO

4' SPEC. LAT. BASE DITCH SEE DETAIL GGQ EST. 95 TONS EST. 135 SYGF

BERM DITCH SEE DETAIL D

BERM DITCH SEE DETAIL SS 175 SY CFM

–EBL– 1110

–EBL– 1115

–EBL– 1120

–WBL– 1110

–WBL– 1115

–WBL– 1120

BILTMORE FARMS, LLC

BILTMORE FARMS, INC.

2512 2514

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

FOR –WBL– & –EBL– PROFILES, SEE SHEETS 53 & 54

5/13/2019
I-4700B_HYD_PRM_PSH_25.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	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
NON JS
SITE 30
SDX
2' SPEC. LAT. BASE DITCH
SEE DETAIL FFF
EST. 912 CY DDE
REMOVE
CLASS 'B' RIPRAP
EST. 5 TONS
EST. 14 SYGF
IMPACTS IN SURFACE WATER (CHANNEL CHANGE)
IMPACTS IN SURFACE WATER (66" RCP)
PLUG & FILL W/ FLOWABLE MATERIAL
CLASS 'B' RIPRAP
EST. 6 TONS
EST. 13 SYGF
CONCRETE ENERGY DISSIPATOR
SEE SPECIAL DETAIL
HW
SITE 31
SDX
1121+00
1120+00
1119+00
1118+00
1117+00
1116+00
1115+00
CLASS 'B' RIPRAP
EST. 5 TONS
EST. 12 SYGF
ENERGY DISSIPATOR
. DETAIL
24" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS
SPRING
IMPACTS IN SURFACE WATER (CHANNEL CHANGE)
PROP. SHOULDER BERM GUTTER
CONCRETE ENERGY DISSIPATOR
SEE SPECIAL DETAIL
66" RCP–IV
BLIND JB
RETAINLINE W/APPROVED LINER
TEMP. IMPACTS IN SURFACE WATER
IMPACTS IN SURFACE WATER (CHANNEL CHANGE)
IMPACTS IN SURFACE WATER (66" RCP)
BLIND JB
66" RCP–IV
RCP–IV
REMOVE
TEMP. IMPACTS IN SURFACE WATER
24" RCP–IV
'BL–
TEMP. IMPACTS IN SURFACE WATER
CLASS 'I' RIPRAP
EST. 48 TONS
EST. 89 SYGF
PROP. SHOULDER BERM GUTTER
TOE PROTECTION
SEE DETAIL LLL
EST. 172 TONS
EST. 278 SYGF

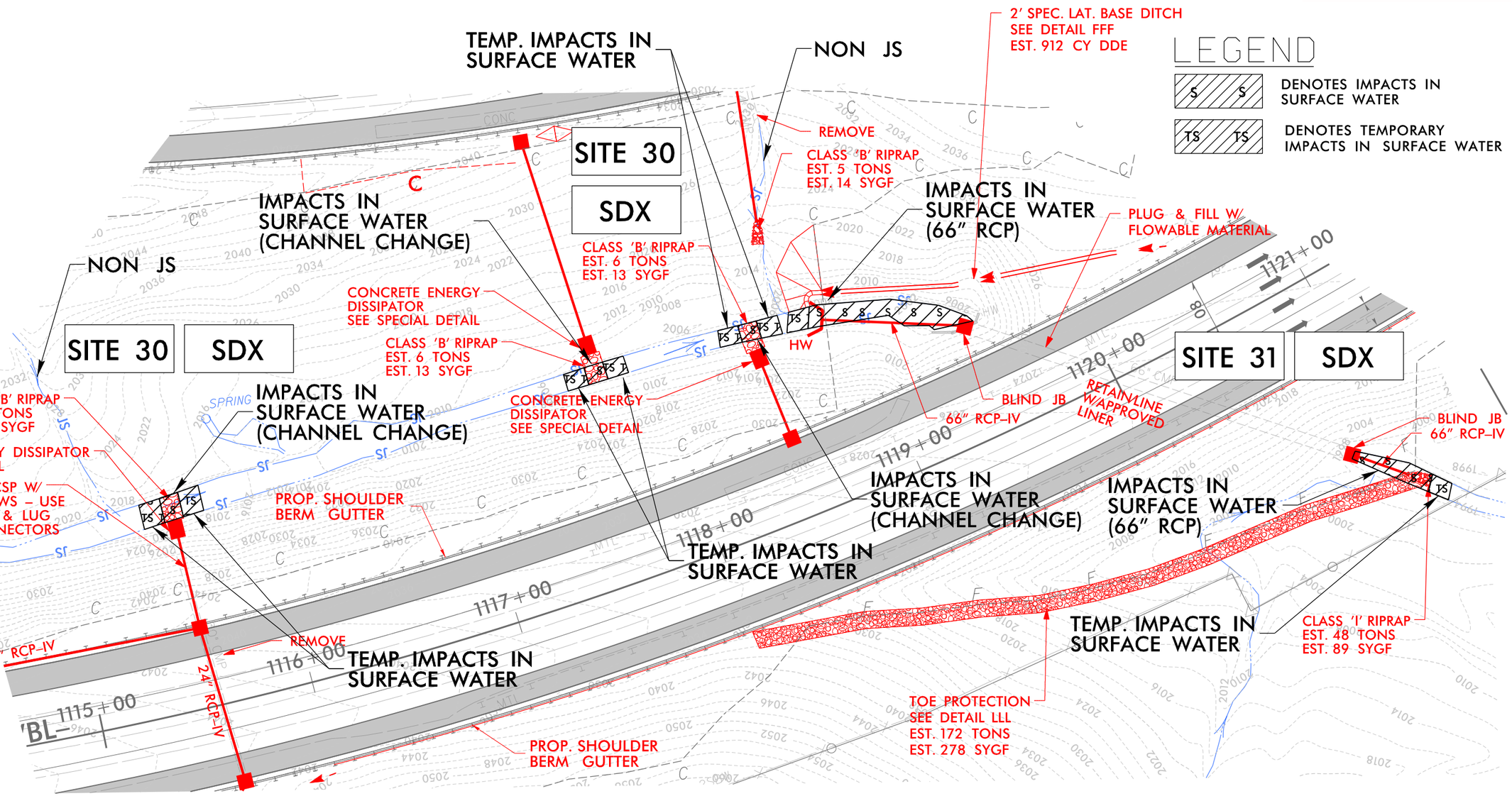
50' 0' 50' 100' 150'
GRAPHIC SCALE

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	25
R/W 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. 1120+01.66 –WBL–
1 @ 66" CMP
℄ ELEV. = 2025.95
SKEW = 45°07'53"

WS EL. = 2003.1'
SURVEY 09–10–17

NATURAL GROUND
RIGHT BANK

HW

66" RCP–IV

BLIND
JB

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

NATURAL GROUND
LEFT BANK

NATURAL GROUND
INV. = 2002.8

INV. = 2000.4

BLIND
JB

66" RCP–IV

NATURAL GROUND
LEFT BANK

INV. = 1994.6

INV. = 1993.8

NATURAL GROUND

NATURAL GROUND
RIGHT BANK

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

5/13/2019
I-4700B_HYD_PRM_PSH_25B_PFL.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	26
RW SHEET NO.	I-4700B-36
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 64 OF 97

WETLAND & STREAM IMPACTS

NAD 83 NAD 83/NA 2011

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

–EBL– 1125

–EBL– 1130

–WBL– 1125

–WBL– 1130

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

IMPACTS IN SURFACE WATER (54" RCP)

NON JS

BILTMORE FARMS, LLC

BILTMORE FARMS, INC.

DRAINAGE DITCH

SITE 33 SEQ

SITE 32 WCW

SITE 32 SEQ

WCW SEQ

TOE PROTECTION
SEE DETAIL TTT
EST. 254 TONS
EST. 549 SYGF

54" RCP-IV
REMOVE HW & 30' OF EX. 42" CMP

2' LATERAL BASE DITCH
SEE DETAIL NNN
EST. 673 CY DDE

PROP. SHOULDER BERM GUTTER

BLIND JB

BERM DITCH
SEE DETAIL SS
230 SY CFM

50:1 FDPS TRANSITION
FROM 12'-0" AT STA. 1123+58
TO 11'-8" AT STA. 1123+75

BDO

18" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

4GI-A SG

2GI-A FG

24" RCP-IV

18" RCP-IV

15" RCP-IV

SPEC. LAT. 'V' DITCH
SEE DETAIL UUU
EST. 15 TONS
EST. 30 SYGF

PLUG & FILL W/ FLOWABLE MATERIAL

SPEC. LAT. 'V' DITCH
SEE DETAIL OOO

36" RCP-IV

2GI-A SG

REMOVE

END SBG STA.
1123+99.90 RT –EBL–
SPECIAL LATERAL 'V' DITCH
SEE DETAIL OOO

END SBG STA.
1128+50.00 LT –WBL–

PROP. SHOULDER BERM GUTTER

FILL IN WETLAND

REMOVE PLUG & FILL W/ FLOWABLE MATERIAL

REMOVE

24" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

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

CONCRETE ENERGY DISSIPATOR
SEE SPECIAL DETAIL

BLIND JB
54" RCP-IV

CLASS 'I' RIPRAP
EST. 33 TONS
EST. 82 SYGF

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

Q2= 45 cfs
V2= 1.3 fps
Q10= 70 cfs
V10= 1.5 fps

MECHANIZED CLEARING IN WETLAND

IMPACTS IN SURFACE WATER (54" 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 54 & 55
FOR –L– WB & EB PROFILES, SEE SHEET 55

5/13/2019
I-4700B_HYD_PRM_PSH_26.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	26
RW SHEET NO.	I-4700B-36
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 65 OF 97

WETLAND & STREAM IMPACTS

NAD 83 NAD 83/NA 2011

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

–EBL– 1125

–EBL– 1130

–WBL– 1130

–WBL– 1125

–L– 1135

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

IMPACTS IN SURFACE WATER (54" RCP)

NON JS

SITE 33 SEQ

SITE 32 WCW

SITE 32 SEQ

SITE 32 WCW

FILL IN WETLAND

MECHANIZED CLEARING IN WETLAND

IMPACTS IN SURFACE WATER (54" RCP)

TEMP. IMPACTS IN SURFACE WATER

FILL IN WETLAND

BERM DITCH SEE DETAIL SS 230 SY CFM

BDO

18" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

4GI-A SG

24" RCP-IV

2GI-A FG

50:1 FDPS TRANSITION FROM 12'-0" AT STA. 1123+58 TO 11'-8" AT STA. 1123+75

18" RCP-IV

24" RCP-IV

SPEC. LAT. 'V' DITCH SEE DETAIL UUU EST. 15 TONS EST. 30 SYGF

TYPE B-7

PROP. SHOULDER BERM GUTTER

END SBG STA 1123+99.90 RT –EBL– SPECIAL LATERAL 'V' DITCH SEE DETAIL OOO

15" RCP-IV

PLUG & FILL W/ FLOWABLE MATERIAL

2GI-A SG

REMOVE

18" RCP-IV

SPEC. LAT. 'V' DITCH SEE DETAIL OOO

36" RCP-IV

CAT-1

END SBG STA. 1128+50.00 LT –WBL–

2' LATERAL BASE DITCH SEE DETAIL NNN EST. 673 CY DDE

PROP. SHOULDER BERM GUTTER

TOE PROTECTION SEE DETAIL TTT EST. 254 TONS EST. 549 SYGF

54" RCP-IV

REMOVE HW & 30' OF EX. 42" CMP

BLIND JB

REMOVE PLUG & FILL W/ FLOWABLE MATERIAL

24" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

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

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

CLASS 'I' RIPRAP EST. 33 TONS EST. 82 SYGF

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

Q2= 45 cfs
V2= 1.3 fps
Q10= 70 cfs
V10= 1.5 fps

BILTMORE FARMS, LLC

BILTMORE FARMS, INC.

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

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

5/13/2019
I-4700B_HYD_PRM_PSH_26.dgn
HNTB

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
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

SITE 33 SEQ

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

IMPACTS IN SURFACE WATER (54" RCP))

54" RCP-IV

REMOVE HW & 30' OF EX. 54" CMP

HW

PROP. SHOULDER BERM GUTTER

BLIND JB

1130+00

1131+00

1132+00

1133+00

-EBL-

-WBL-

CP-IV

RETAIN LINE W/APPROVED LINER

REMOVE PLUG & FILL W/ FLOWABLE MATERIAL

36" RCP-IV

REMOVE

BLIND JB
54" RCP-IV

FILL IN WETLAND

IMPACTS IN SURFACE WATER (54" RCP)

CLASS 'I' RIPRAP
EST. 33 TONS
EST. 62 SYGF

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

FILL IN WETLAND

FILL IN WETLAND

MECHANIZED CLEARING IN WETLAND

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

SITE 32 SEQ

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

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

I-4700	26
RW 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 (54" RCP))

SITE 33 SEQ

54" RCP-IV

REMOVE HW & 30' OF EX. 54" CMP

HW

PROP. SHOULDER BERM GUTTER

BLIND JB

1131+00

1132+00

REMOVE

1130+00

-EBL-

CP-IV

RETAIN IN APPROVED LINER

1131+00

1132+00

REMOVE PLUG & FILL W/ FLOWABLE MATERIAL

1133+00

-WBL-

36" RCP-IV

REMOVE

BLIND JB

54" RCP-IV

FILL IN WETLAND

IMPACTS IN SURFACE WATER (54" RCP)

CLASS 'I' RIPRAP
EST. 33 TONS
EST. 62 SYGF

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

FILL IN WETLAND

FILL IN WETLAND

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

MECHANIZED CLEARING IN WETLAND

SITE 32 SEQ

50' 0' 50' 100' 150'

GRAPHIC SCALE

LEGEND

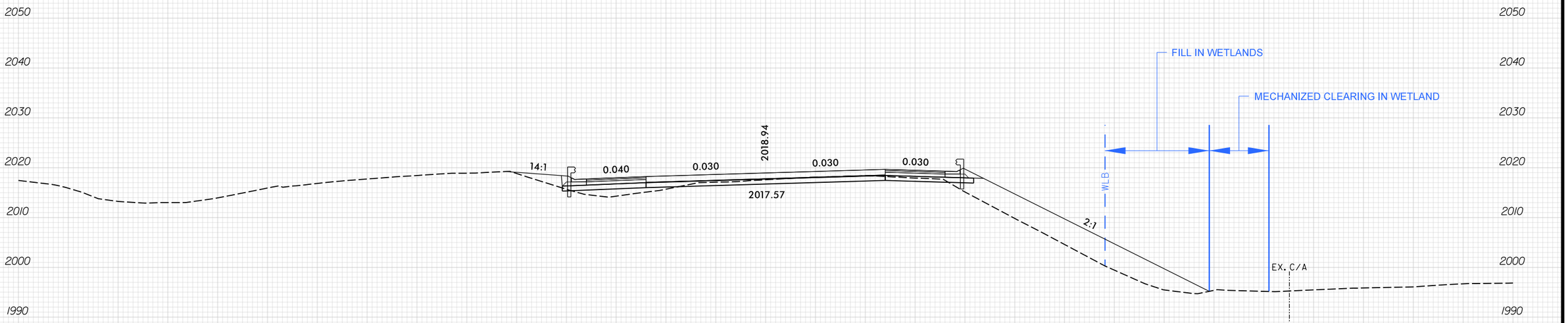
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S S — DENOTES IMPACTS IN SURFACE WATER
- F F — DENOTES FILL IN WETLAND
- DENOTES MECHANIZED CLEARING

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

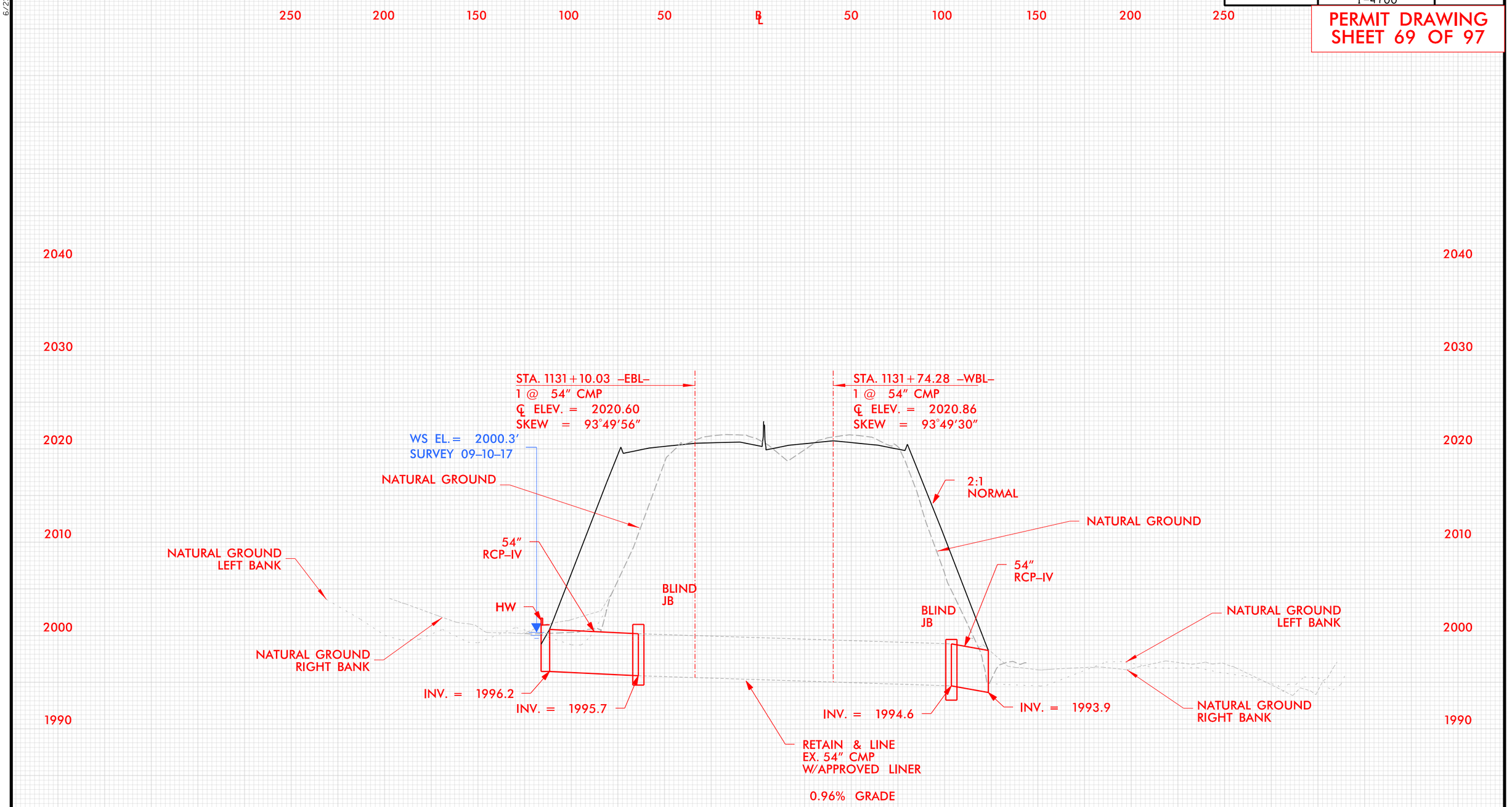
BUNCOMBE & HENDERSON COUNTY
PROJECT: I-4700
I-26
FROM 0.3 MI EAST OF NC 280 (AIRPORT RD.)
TO 0.5 MI EAST OF NC 191 (BREVARD RD.)

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



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.)

5/14/2019
14208B_HYD_PRM_PSH_26_PFL.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	27
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 70 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

1135 1140 1145

20 BILTMORE FARMS, LLC

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

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

IMPACTS IN SURFACE WATER (42" RCP)

TEMP. IMPACTS IN SURFACE WATER

SITE 34 SED

SITE 36 SEF

SITE 32 WCW

SITE 35 WCZ

SITE 37 SEF

TOE PROTECTION SEE DETAIL TTT EST. 210 TONS EST. 465 SYGF

TOE PROTECTION SEE DETAIL TTT EST. 50 TONS EST. 110 SYGF

PROP. SHOULDER BERM GUTTER

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

TOE PROTECTION SEE DETAIL TTT EST. 15 TONS EST. 40 SYGF

WALL GUTTER BEHIND WALL SEE DETAIL U

END WALL GUTTER 1146+58.00 LT –L–

HW

42" RCP–IV

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

REMOVE

15" RCP–IV

RETAINING LINER (WARM POND)

FILL IN WETLAND

FILL IN WETLAND

REMOVE

FILL W/FLOWABLE MATERIAL

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

PROP. SHOULDER BERM GUTTER

18" CSP W/ 2 ELBOWS

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

Q2 = 26 cfs
V2 = 0.6 fps
Q10 = 29 cfs
V10 = 0.6 fps

RETAIN EXISTING OUTLET (PDS STR # 2722)

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

MECHANIZED CLEARING IN WETLAND

FILL IN WETLAND

MECHANIZED CLEARING IN WETLAND

BILTMORE FARMS, INC.

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
I-4700B_HYD_PRM_PSH_27.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	27
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING SHEET 71 OF 97

WETLAND & STREAM IMPACTS

NAD 83

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

MATCHLINE SHEET 26
–L– STA 1135+00.00

MATCHLINE SHEET 28
–L– STA 1149+00.00

SITE 34 SED

SITE 32 WCW

SITE 35 WCZ

SITE 36 SEF

SITE 37 SEF

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

IMPACTS IN SURFACE WATER (36" RCP)

PIPE NOT BURIED

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

IMPACTS IN SURFACE WATER (42" RCP)

TEMP. IMPACTS IN SURFACE WATER

50:1 FDPS TRANSITION FROM 12'-0" AT STA. 1140+33 TO 11'-8" AT STA. 1140+50

TOE PROTECTION SEE DETAIL TTT EST. 210 TONS EST. 465 SYGF

TOE PROTECTION SEE DETAIL TTT EST. 50 TONS EST. 110 SYGF

PROP. SHOULDER BERM GUTTER

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–

18" RCP-IV

TOE PROTECTION SEE DETAIL TTT EST. 15 TONS EST. 40 SYGF

WALL GUTTER BEHIND WALL SEE DETAIL U

END WALL GUTTER 1146+58.00 LT –L–

HW

INV=2018.0

42" RCP-IV

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

REMOVE

15" RCP-IV

RETAINING LINER (EMBEDDED UNDER ROADWAY)

REMOVE HW

RETAINING LINER TO BE REMOVED

15" RCP-IV

REMOVE

FILL W/FLOWABLE MATERIAL

FILL IN WETLAND

FILL IN WETLAND

REMOVE

REMOVE

15" CSP W/ 2 ELBOWS

INV=2002.0

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

CLASS 'I' RIPRAP EST. 10 TONS EST. 23 SYGF

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

PROP. SHOULDER BERM GUTTER

18" CSP W/ 2 ELBOWS

INV=2006.4

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

Q2= 26 cfs
V2= 0.6 fps
Q10= 29 cfs
V10= 0.6 fps

RETAIN EXISTING OUTLET (PDS STR # 2722)

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

15" CSP W/ 2 ELBOWS

INV=2009.4

MECHANIZED CLEARING IN WETLAND

MECHANIZED CLEARING IN WETLAND

FILL IN WETLAND

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

BILTMORE FARMS, INC.

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
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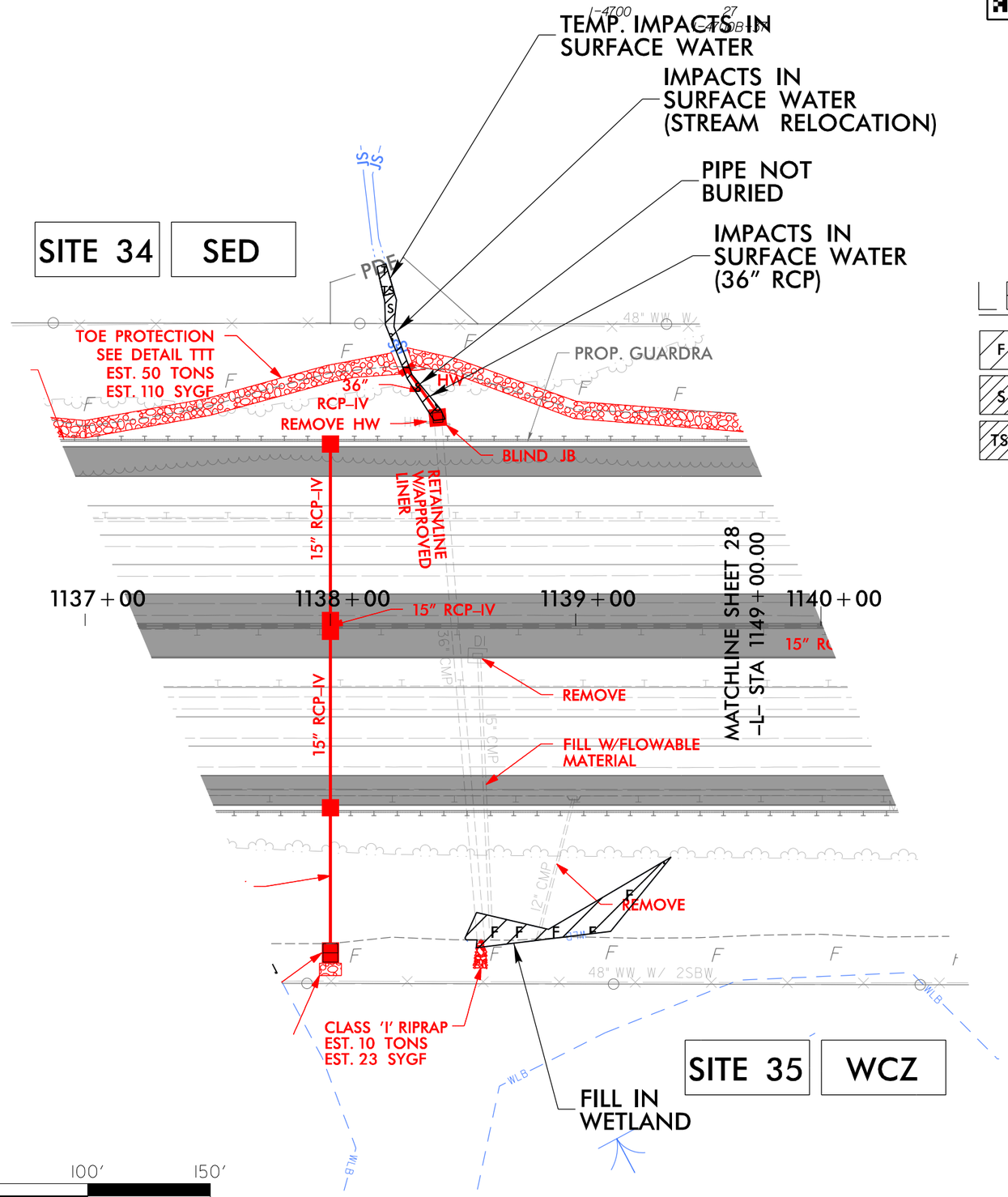
HNTB

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 72 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′

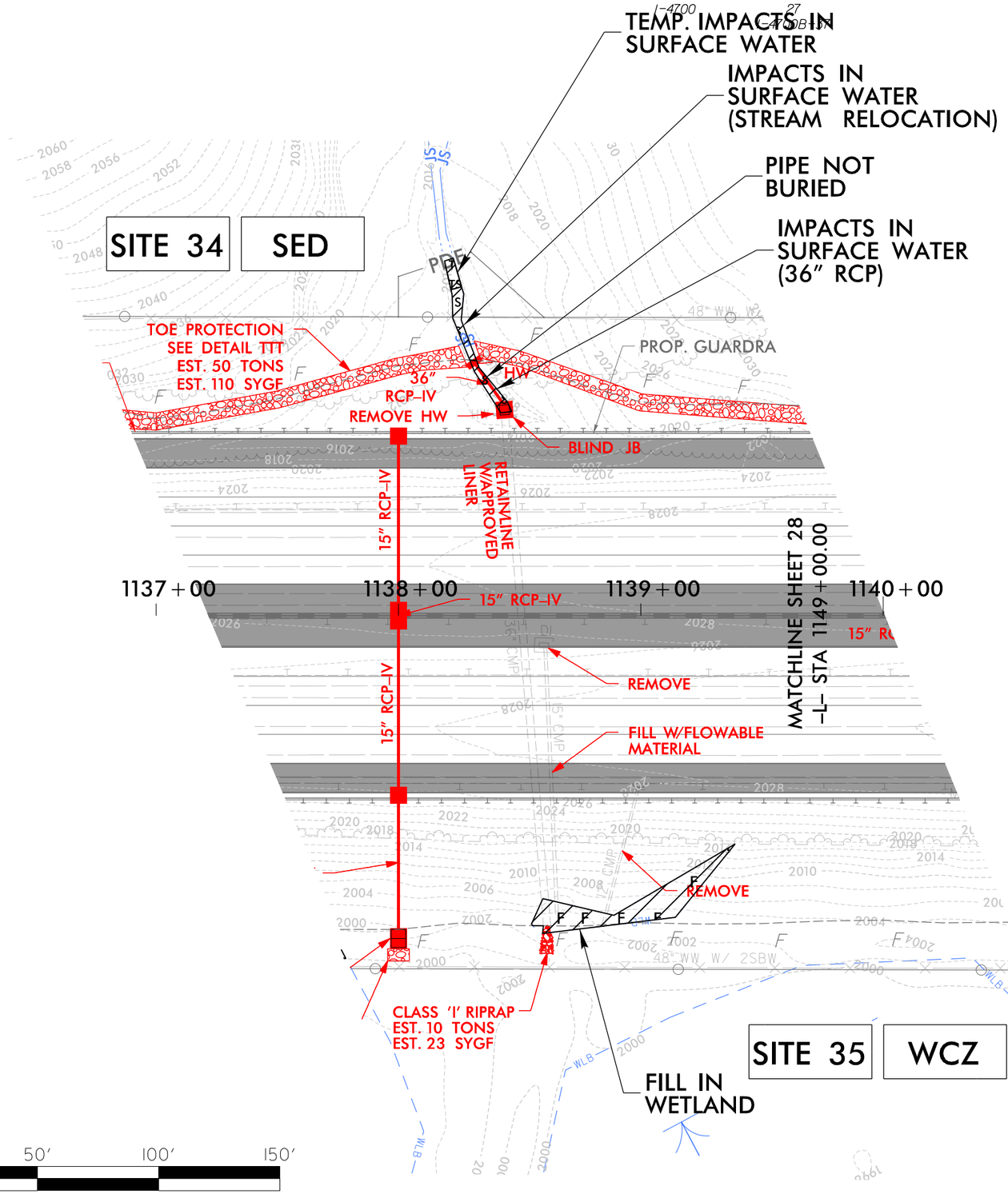
GRAPHIC SCALE

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

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

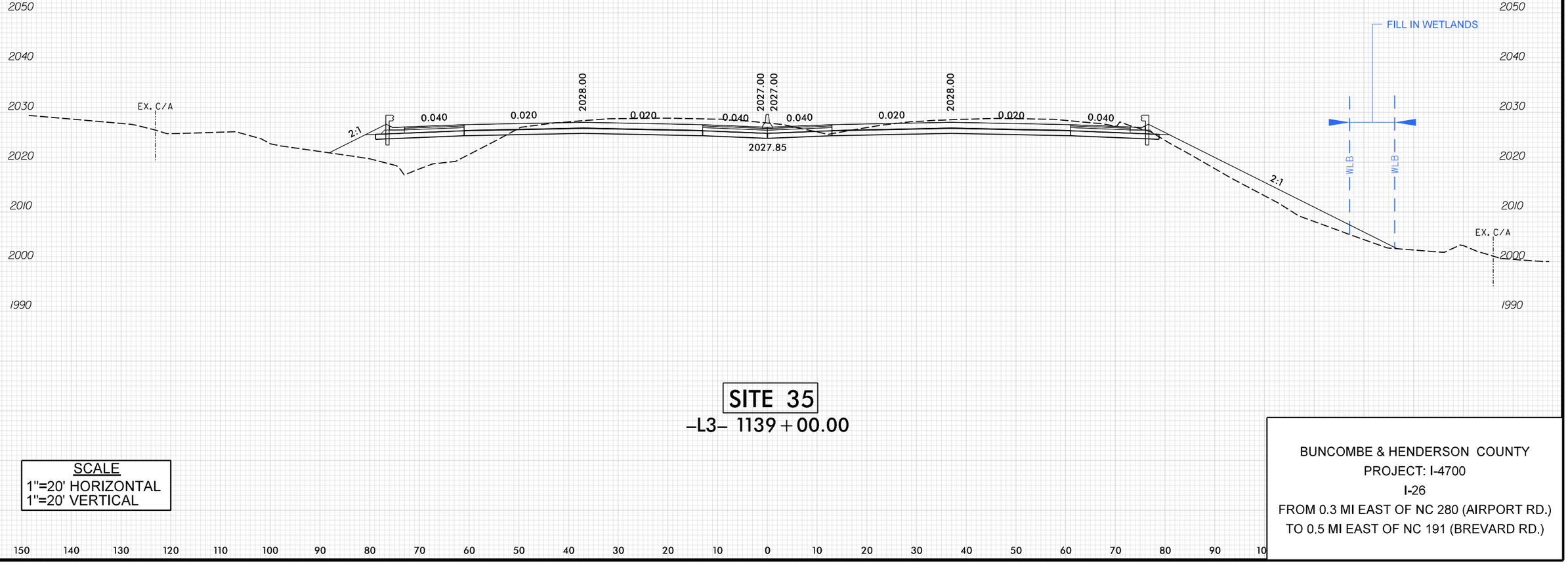
FOR -L- EB & -L- WB PROFILES, SEE SHEETS 55 & 56
FOR RETAINING WALL -RW16-, SEE SHEETS W-17
FOR RETAINING WALL -RW17-, SEE SHEETS W-18

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.)

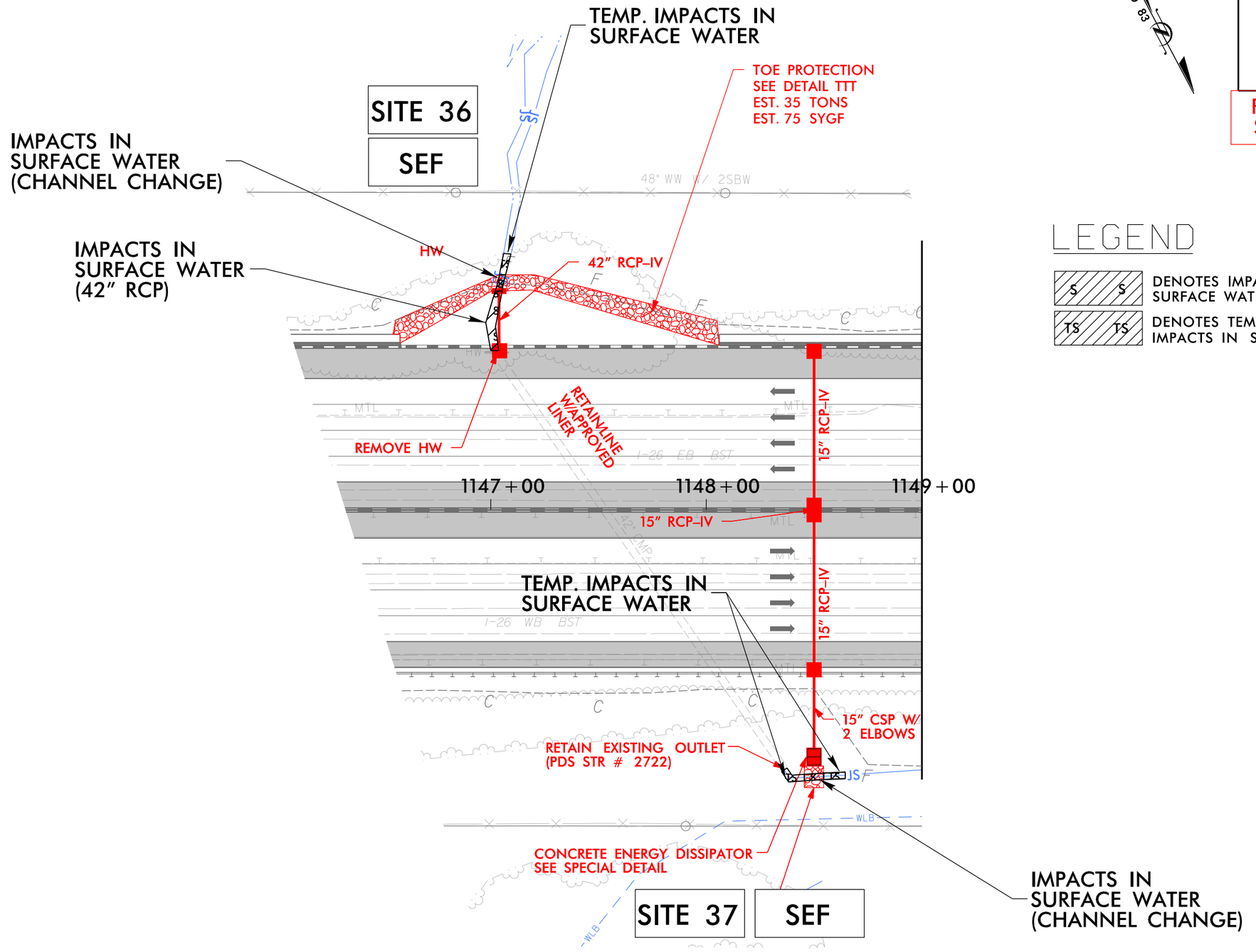
11/14/2018
I-4700B_HYD_PRM_XPL.dgn
HNTB

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

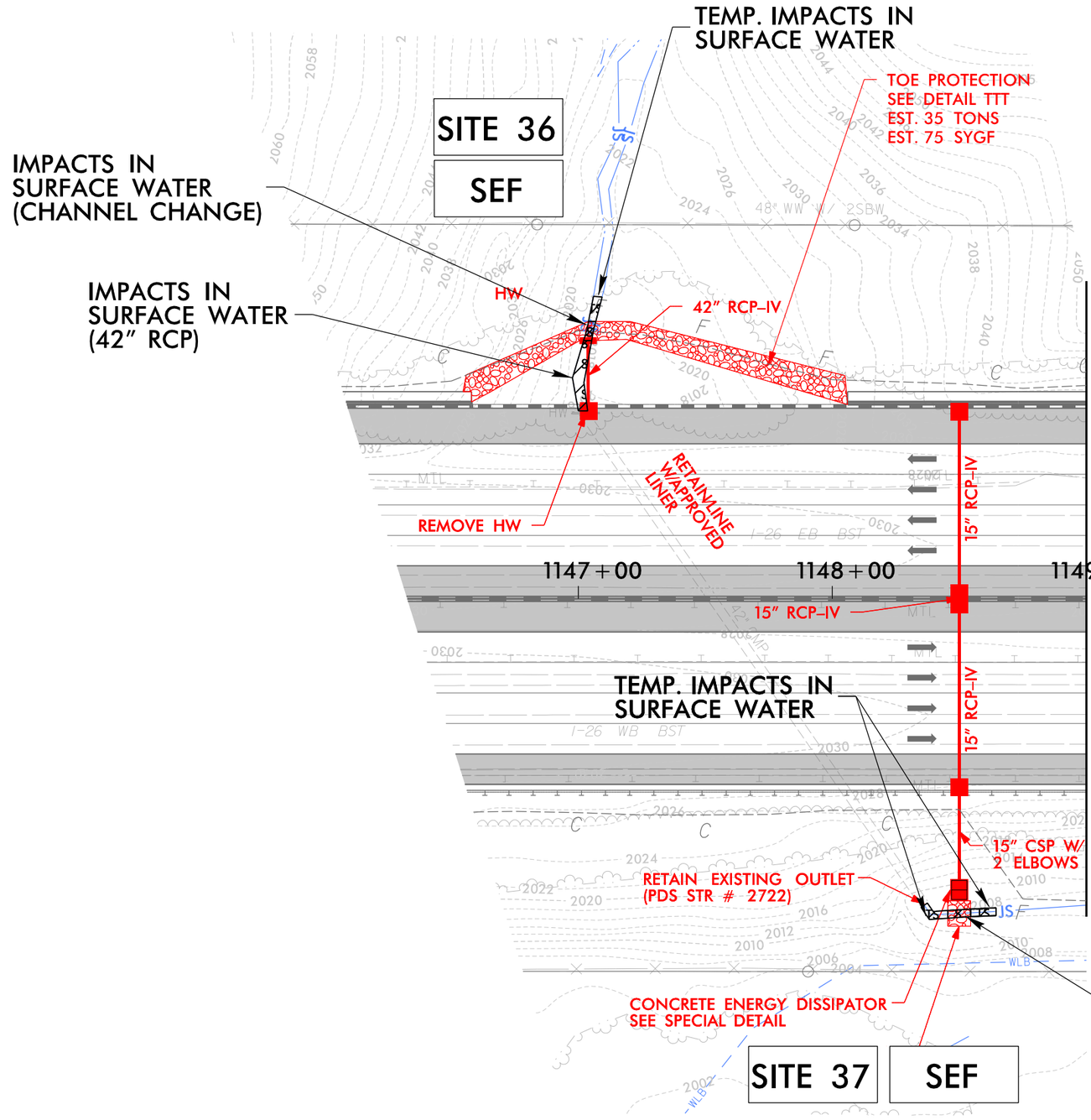
50′ 0′ 50′ 100′ 150′
GRAPHIC SCALE

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

7/19/2017

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	28
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 77 OF 97

WETLAND & STREAM IMPACTS

BILTMORE FARMS, LLC

NAD 83

LEGEND

- F / F — DENOTES FILL IN WETLAND
- TS / TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S / S — DENOTES IMPACTS IN SURFACE WATER

MATCHLINE SHEET 27
–L– STA 1149+00.00

MATCHLINE SHEET 29
–L– STA 1163+00.00

1150 1155 1160

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)

WALL GUTTER BEHIND WALL SEE DETAIL U

2GI-8 SG

BDO

30" CSP

15" CSP

30" RCP-IV

18" RCP-IV

24" RCP-IV

15" RCP-IV

REMOVE

FILL W/ FLOWABLE MATERIAL

PROPOSED RIPRAP BENCHES

RETAIN

FILL W/ FLOWABLE MATERIAL TB2GI-A FG

TEMP. IMPACTS IN SURFACE WATER

REMOVE PROP. SHOULDER BERM GUTTER

FILL W/ FLOWABLE MATERIAL 2 ELBOWS

15" CSP CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

30" CSP W/2 ELBOWS

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

TEMP. IMPACTS IN SURFACE WATER (TEMP. PIPE FOR ACCESS ROAD)

END SBG STA. 1160+10.49 RT –L–

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

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

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

NON JS FROM –L– STA. 1152+82 TO –L– STA. 1153+90

BILTMORE FARMS, INC.

FRENCH BROAD RIVER

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

FOR –L– EB & –L– WB PROFILES, SEE SHEETS 86 & 87
FOR RETAINING WALL –RW17–, SEE SHEETS W-19

12/13/2018
I-4700_HYD_PRM_PSH_28.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	28
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 78 OF 97

WETLAND & STREAM IMPACTS

NAD 83

LEGEND

- F / F — DENOTES FILL IN WETLAND
- TS / TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER
- S / S — DENOTES IMPACTS IN SURFACE WATER

BILTMORE FARMS, LLC

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)

WALL GUTTER BEHIND WALL SEE DETAIL U

2GI–B SG

BDO

30" CSP

2GI–B SG

15" CSP

15" CSP

30" RCP–IV

15" RCP–IV

REMOVE

FILL W/ FLOWABLE MATERIAL

15" RCP–IV

30" RCP–IV

18" RCP–IV

24" RCP–IV

PROPOSED RETAINING WALL

REMOVE

FILL W/ FLOWABLE MATERIAL

TEMP. IMPACTS IN SURFACE WATER

REMOVE

FILL W/ FLOWABLE MATERIAL TB2GI–A FG

FILL W/ FLOWABLE MATERIAL 2 ELBOWS

15" CSP W/

REMOVE PROP. SHOULDER BERM GUTTER

REMOVE

15" CSP CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

REMOVE

30" CSP W/2 ELBOWS

TEMP. IMPACTS IN SURFACE WATER (TEMP. PIPE FOR ACCESS ROAD)

END SBG STA. 1160+10.49 RT –L–

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

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

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

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)

NON JS FROM –L– STA. 1152+82 TO –L– STA. 1153+90

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

FOR –L– EB & –L– WB PROFILES, SEE SHEETS 86 & 87
FOR RETAINING WALL –RW17–, SEE SHEETS W–19

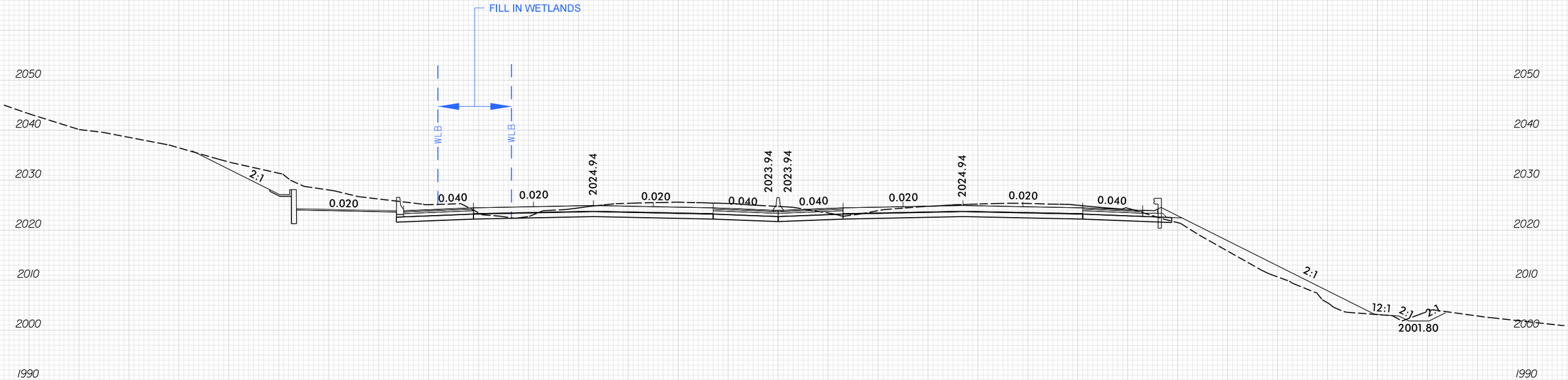
12/13/2018
14700B_HYD_PRM_PSH_28.dgn
HNTB

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.)

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
R/W 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

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 28
-L- STA 1163+00.00

MATCHLINE SHEET 30
-L- STA 1175+50.00

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

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
R/W 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 40
FRENCH BROAD RIVER

SITE 41 SFG

BILTMORE FARMS, INC.

COUNTY OF BUNCOMBE

ASHEVILLE CITY LIMITS

WEST RANGE, LLC

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–

BEGIN SBG STA.
1170+00.00 RT –L–

END SBG
BEGIN WALL CUTTER
STA 1172+00.00 RT –L–

15" CSP

CONCRETE ENERGY DISSIPATOR
SEE SPECIAL DETAIL

CLASS 'B' RIPRAP
EST. 7 TONS
EST. 16 SYGF

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

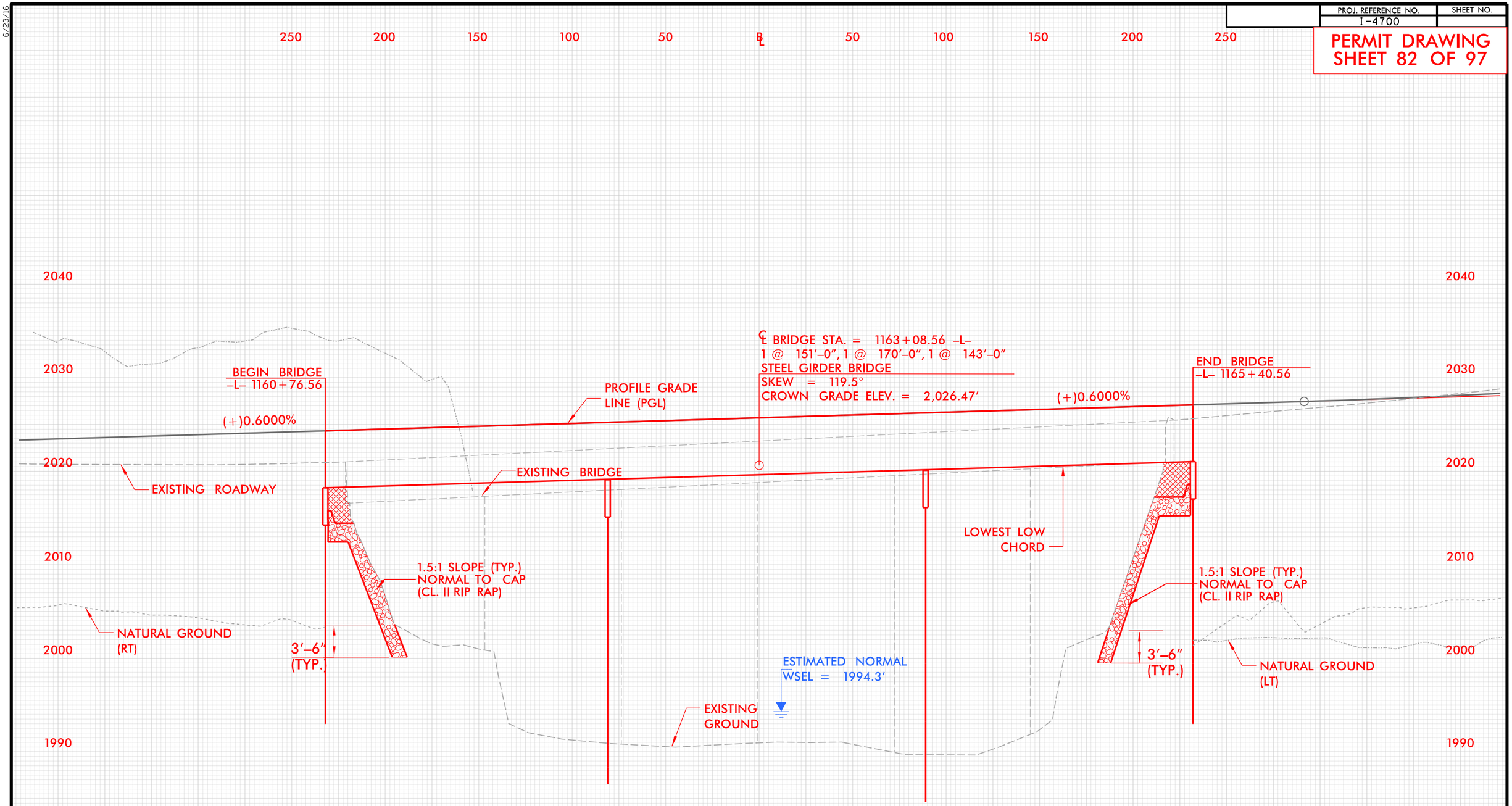
FOR –L– EB & –L– WB PROFILES, SEE SHEETS 57 & 58
FOR RETAINING WALL –RW18–, SEE SHEETS W–19
FOR RETAINING WALL –RW19–, SEE SHEETS W–20
FOR RETAINING WALL –RW20–, SEE SHEETS W–21

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



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

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

I180

I185

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" RCP-IV

18" RCP-IV

TOP=2056.0
INV=2051.7

TOP=2062.0
INV=2057.0

TOP=2052.4
INV=2039.2

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

TYPE B-77

30" CSP W/1 ELBOW

TOP=2076.5
INV=2071.0

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–

TOP=2079.3
INV=2075.5

TOP=2078.9
INV=2070.9

TOP=2075.6
INV=2068.4

TOP=2080.1
INV=2075.4

WALL GUTTER BEHIND WALL
SEE DETAIL U

TOP=2089.6
INV=2079.2

TOP=2087.5
INV=2083.7

TOP=2083.5
INV=2079.2

TOP=2083.3
INV=2078.9

TOP=2083.7
INV=2077.8

TOP=2076.8
INV=2062.8

TOP=2073.6
INV=2067.6

30" CSP W/2 ELBOWS

TOP=2070.8
INV=2062.9

SPECIAL LATERAL 'V' DITCH
SEE DETAIL DDD
EST. 25 SYGF
EST. 14 CY DDE

TOP=2068.8
INV=2063.8

FILL W/FLOWABLE MATERIAL

PROP. SHOULDER BERM GUTTER

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
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7/19/2017

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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 84 OF 97

WETLAND & STREAM IMPACTS

NAD 83

LEGEND

F F — DENOTES FILL IN WETLAND

DENOTES MECHANIZED CLEARING

MATCHLINE SHEET 29
–L– STA 1175+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

REMOVE

15" RCP-IV

TOP=2056.0
INV=2051.7

15" RCP-IV

TOP=2052.4
INV=2039.2

15" CSP W/
2 ELBOWS

INV=2024.8

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

REMOVE

24" CSP W/
2 ELBOWS

TOP=2058.8
INV=2040.0

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

REMOVE

INV=2022.0

MECHANIZED CLEARING
IN WETLAND

SITE 43 | WDZ

FILL IN
WETLAND

TYPE B-77

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

PROP. SHOULDER
BERM GUTTER

TOP=2067.0
INV=2061.5

REMOVE

24" RCP-IV

TOP=2062.4
INV=2067.0

REMOVE

24" RCP-IV

TOP=2058.8
INV=2040.0

REMOVE

2' SPECIAL LATERAL BASE DITCH
SEE DETAIL FFF

30" CSP
W/1 ELBOW

TOP=2076.5
INV=2071.0

30" RCP-IV

TOP=2078.9
INV=2070.9

30" RCP-IV

TOP=2076.8
INV=2062.8

34" RCP-IV

REMOVE

30" CSP
W/2 ELBOWS

INV=2062.9

SPECIAL LATERAL 'V' DITCH
SEE DETAIL DDD
EST. 25 SYGF
EST. 14 CY DDE

INV=2081.3

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–
TOP=2079.3
INV=2075.5

FFE B-7

30" RCP-IV

REMOVE

TOP=2075.6
INV=2068.4

REMOVE

30"
RCP-IV

TOP=2080.1
INV=2075.4

WALL GUTTER BEHIND WALL
SEE DETAIL U

TOP=2089.6
INV=2079.2

TOP=2087.5
INV=2083.7

18" RCP-IV

15" RCP-IV

TOP=2083.5
INV=2079.2

TOP=2083.3
INV=2078.9

REMOVE

18"
RCP-IV

15" RCP-IV

TOP=2083.7
INV=2077.8

24" RCP-IV

TOP=2078.8
INV=2078.8

FILL W/FLOWABLE
MATERIAL

REMOVE

FILL W/FLOWABLE
MATERIAL

PROP. SHOULDER
BERM GUTTER

MATCHLINE SHEET 31
–L– STA 1188+50.00

COUNTY OF BUNCOMBE

ASHEVILLE CITY LIMITS

DIXIE JOANN BROWN
IRREVOCABLE TRUST

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
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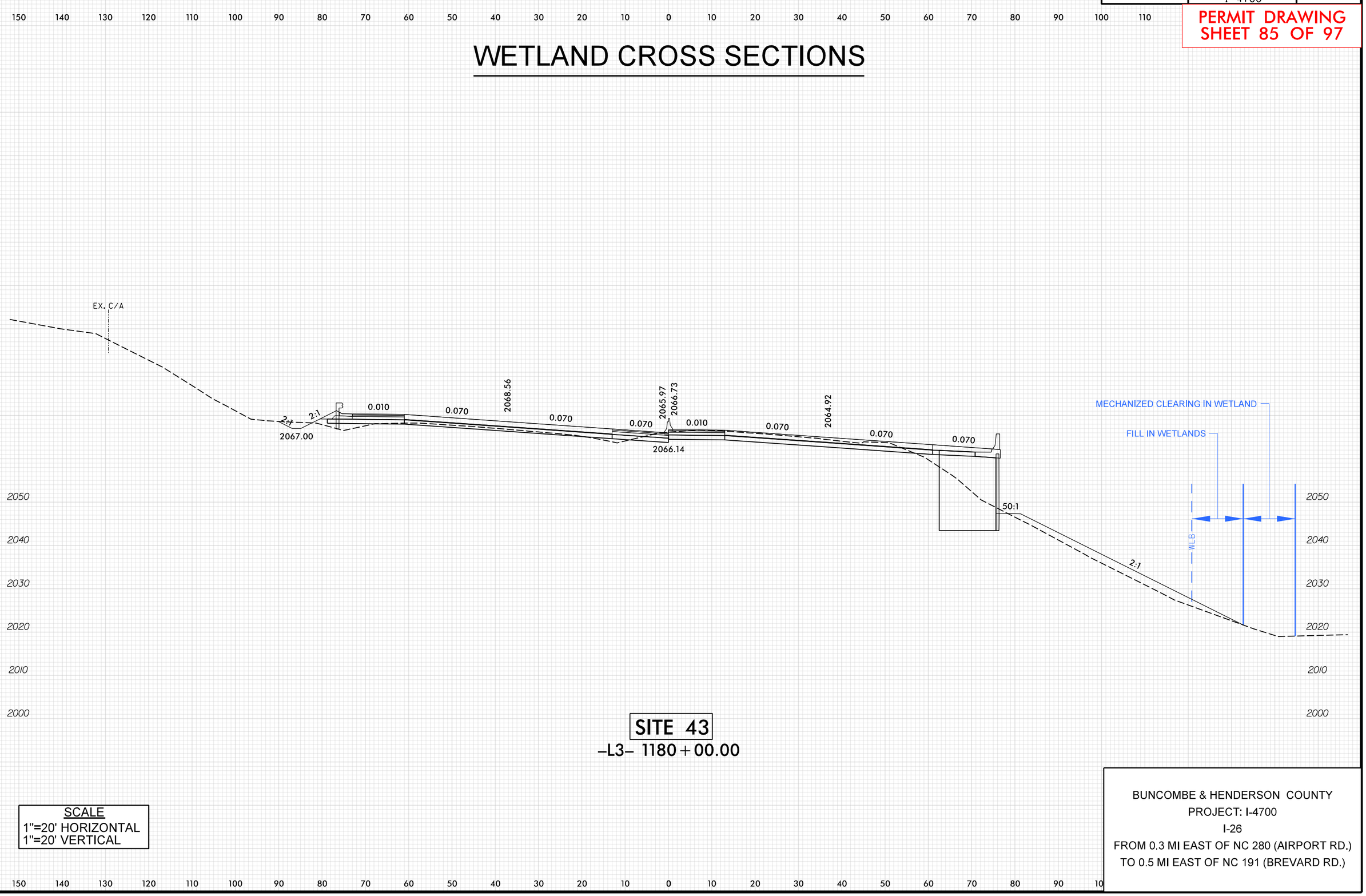
HNTB

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 NAB 83/NA 2011

PERMIT DRAWING SHEET 86 OF 97

WETLAND & STREAM IMPACTS

LEGEND

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

SITE 45 SFR

SITE 44 SFG

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

TEMP. IMPACTS IN SURFACE WATER

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–

TOE PROTECTION SEE DETAIL AAAA EST. 250 TONS EST. 555 SYGF

CONCRETE DITCH BEHIND RETAINING WALL SEE DETAIL U

TAPERED INLET W/HW – SEE SPECIAL DETAIL

PROP. SHOULDER BERM GUTTER

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

CLASS 'I' RIPRAP EST. 26 TONS EST. 56 SYGF

24" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

RETAINING WALL APPROVED LINE

DIXIE JOANN BROWN IRREVOCABLE TRUST

WILLENA SAMS

OWNERSHIP UNKNOWN

STEVE A. & MARLENE V. BALDWIN

DEBORAH A. & ROY E. INGLE

MARLENE V. & STEVE BALDWIN

VANETTE S. & STEVE A. BALDWIN

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

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

5/13/2019
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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	31
	R/W SHEET NO.	I-4700B-41
	ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83 NAD 83/NA 2011

WETLAND & STREAM IMPACTS

PERMIT DRAWING SHEET 87 OF 97

LEGEND

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

MATCHLINE SHEET 30 –L– STA 1188+50.00

MATCHLINE SHEET 32 –L– STA 1202+00.00

SITE 45 SFR

SITE 44 SFG

TEMP. IMPACTS IN SURFACE WATER

IMPACTS IN SURFACE WATER (CHANNEL CHANGE)

TEMP. IMPACTS IN SURFACE WATER

BEGIN SBG STA. 1198+25.00 LT –L–

END SBG STA. 1193+75.00 RT –L–

END WALL GUTTER 1194+92.00 LT –L–

TOE PROTECTION SEE DETAIL AAAA EST. 250 TONS EST. 555 SYGF

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

CLASS 'I' RIPRAP EST. 26 TONS EST. 50 SYGF

24" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

TAPERED INLET W/HW – SEE SPECIAL DETAIL

CONCRETE DITCH BEHIND RETAINING WALL SEE DETAIL U

PLUG & FILL W/ FLOWABLE MATERIAL

PROP. SHOULDER BERM GUTTER

RETAINING WALL APPROVED LINER

DIXIE JOANN BROWN IRREVOCABLE TRUST

WILLENA SAMS

OWNERSHIP UNKNOWN

STEVE A. & MARLENE V. BALDWIN

DEBORAH A. & ROY E. INGLE

MARLENE V. & STEVE BALDWIN

VANETTE S. & STEVE A. BALDWIN

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

5/13/2019
I-4700B_HYD_PRM_PSH_31.dgn
HNTB

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NC License No: C-1554

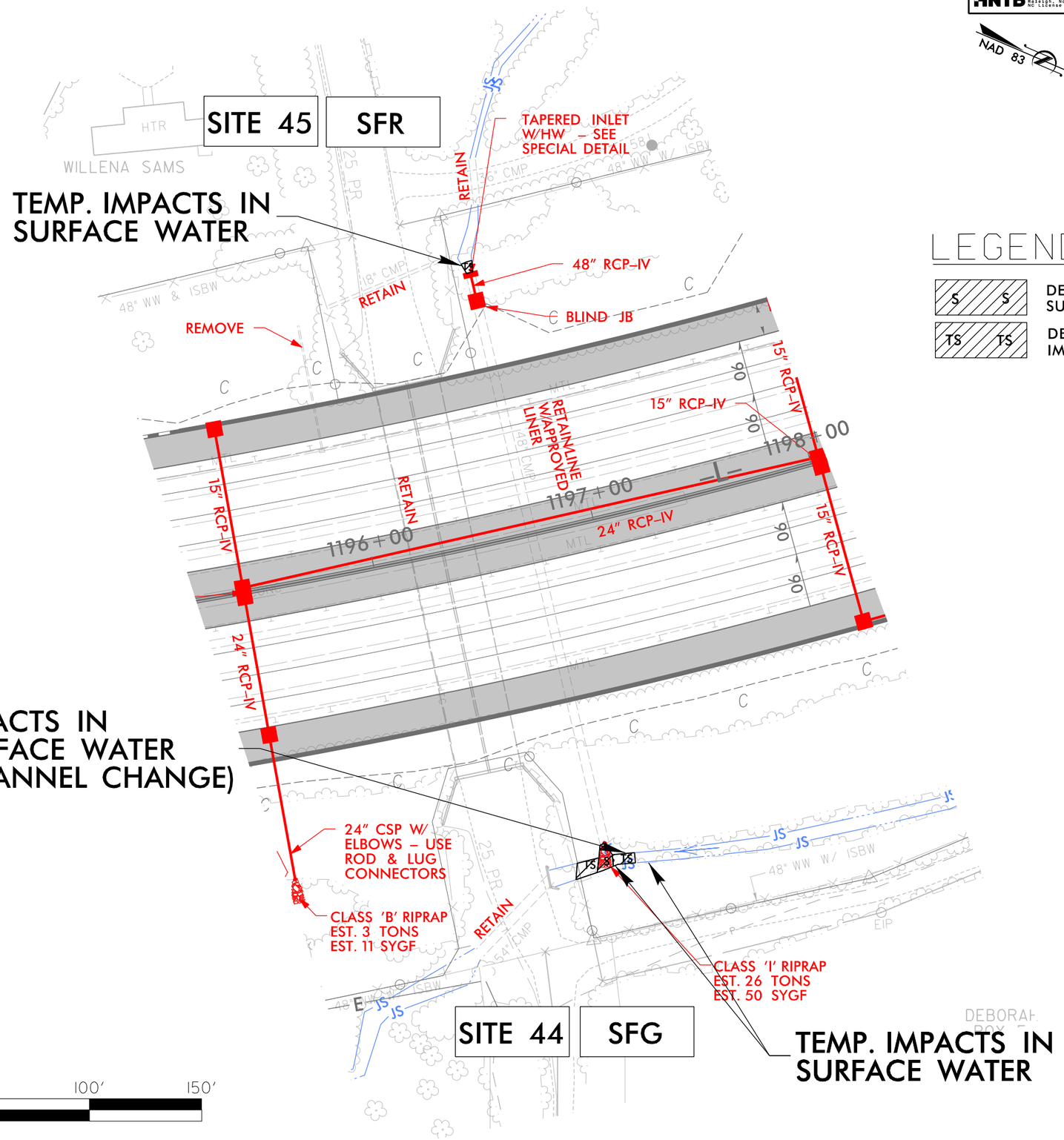
PROJECT REFERENCE NO.	SHEET NO.
I-4700	31
RW SHEET NO.	I-4700B-41
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

NAD 83

PERMIT DRAWING SHEET 88 OF 97

LEGEND

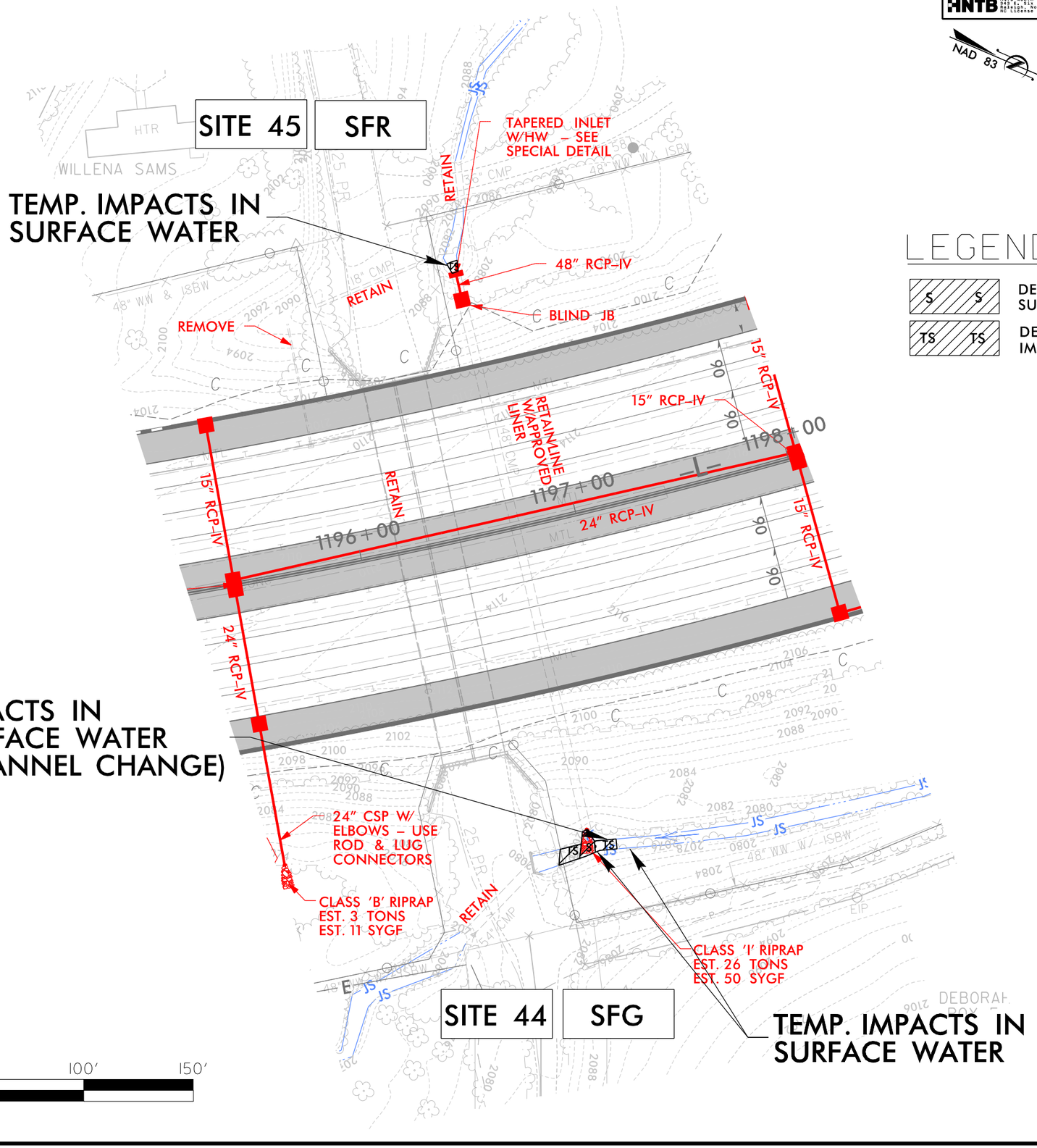
- S S — DENOTES IMPACTS IN SURFACE WATER
- TS TS — DENOTES TEMPORARY IMPACTS IN SURFACE WATER



HNTB NORTH CAROLINA, P.C. 343 W. 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 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 NAD 83/NA 2011

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

JAMES R. SCHRADER

MISSION HEALTH, INC.

WEST RANGE, LLC

VANETTE S. & STEVE A. BALDWIN

SITE 46
SFQ

NON JS

RETAIN

TAPERED INLET W/HW – SEE SPECIAL DETAIL

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

30" RCP-IV
BLIND JB

TIE PROP. TYPICAL CUT DITCH INTO PROP. 4' SPEC. LAT. BASE DITCH

PROP. SHOULDER BERM GUTTER

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

15" RCP-IV

RETAINING WALL APPROVED LINER

REMOVE

PLUG & FILL W/ FLOWABLE MATERIAL

TYPE B-77

BEGIN SBG STA. 1206+75.00RT –L–

15" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

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

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

HW

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

5/17/2018
I-4700B_HYD_PRM_PSH_32.dgn
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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
R/W SHEET NO.	I-4700B-42
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

PERMIT DRAWING
SHEET 91 OF 97

WETLAND & STREAM IMPACTS

NAD 83 NAD 83/NA 2011

LEGEND

DENOTES IMPACTS IN SURFACE WATER

MATCHLINE SHEET 31
–L– STA 1202+00.00

MATCHLINE SHEET 33
–L– STA 1215+00.00

NON JS

TAPERED INLET W/HW – SEE SPECIAL DETAIL

TOE PROTECTION
SEE DETAIL AAAA
EST. 40 TONS
EST. 95 SYGF

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

30" RCP-IV
BLIND JB

TIE PROP. TYPICAL CUT DITCH INTO PROP. 4' SPEC. LAT. BASE DITCH

PROP. SHOULDER BERM GUTTER

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

15" RCP-IV

RETAINING WALL APPROVED LINER

REMOVE

PLUG & FILL W/ FLOWABLE MATERIAL

TYPE B-77

BEGIN SBG STA. 1206+75.00RT –L–

15" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

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

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

CLASS 'I' RIPRAP
EST. 11 TONS
EST. 16 SYGF

PIPE NOT BURIED

IMPACTS IN SURFACE WATER (42" RCP)

SITE 46
SFQ

RETAIN

24" CONC C&G

JAMES R. SCHRADER

ASHEVILLE CITY LIMITS

MISSION HEALTH, INC.

WEST RANGE, LLC

VANETTE S. & STEVE A. BALDWIN

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

5/13/2019
I-4700B_HYD_PRM_PSH_32.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 92 OF 97

WETLAND & STREAM IMPACTS

NAD 83

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

MATCHLINE SHEET 32
–L– STA 1215+00.00

MATCHLINE SHEET 34
–L– STA 1228+50.00

TEMP. IMPACTS IN SURFACE WATER

SITE 47 | SFQ

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AAAA

IMPACTS IN SURFACE WATER (42" RCP)

PIPE NOT BURIED

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

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

42" RCP-IV BLIND JB

RETAINING WALL APPROVED UNDER

BERM DITCH SEE DETAIL D

PROP. SHOULDER BERM GUTTER

15" RCP-IV
18" RCP-IV
24" RCP-IV
REMOVE
FS-1

RIDGEFIELD BUSINESS CENTER II PROPERTY OWNERS ASSOCIATION, INC.

WEST RANGE, LLC

DATUR

ISBKBUS

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

12" RCP-IV BLIND JB

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AAAA

BERM DITCH SEE DETAIL D

IMPACTS IN SURFACE WATER (42" RCP)

PIPE NOT BURIED

RETAINING WALL APPROVED UNDER

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

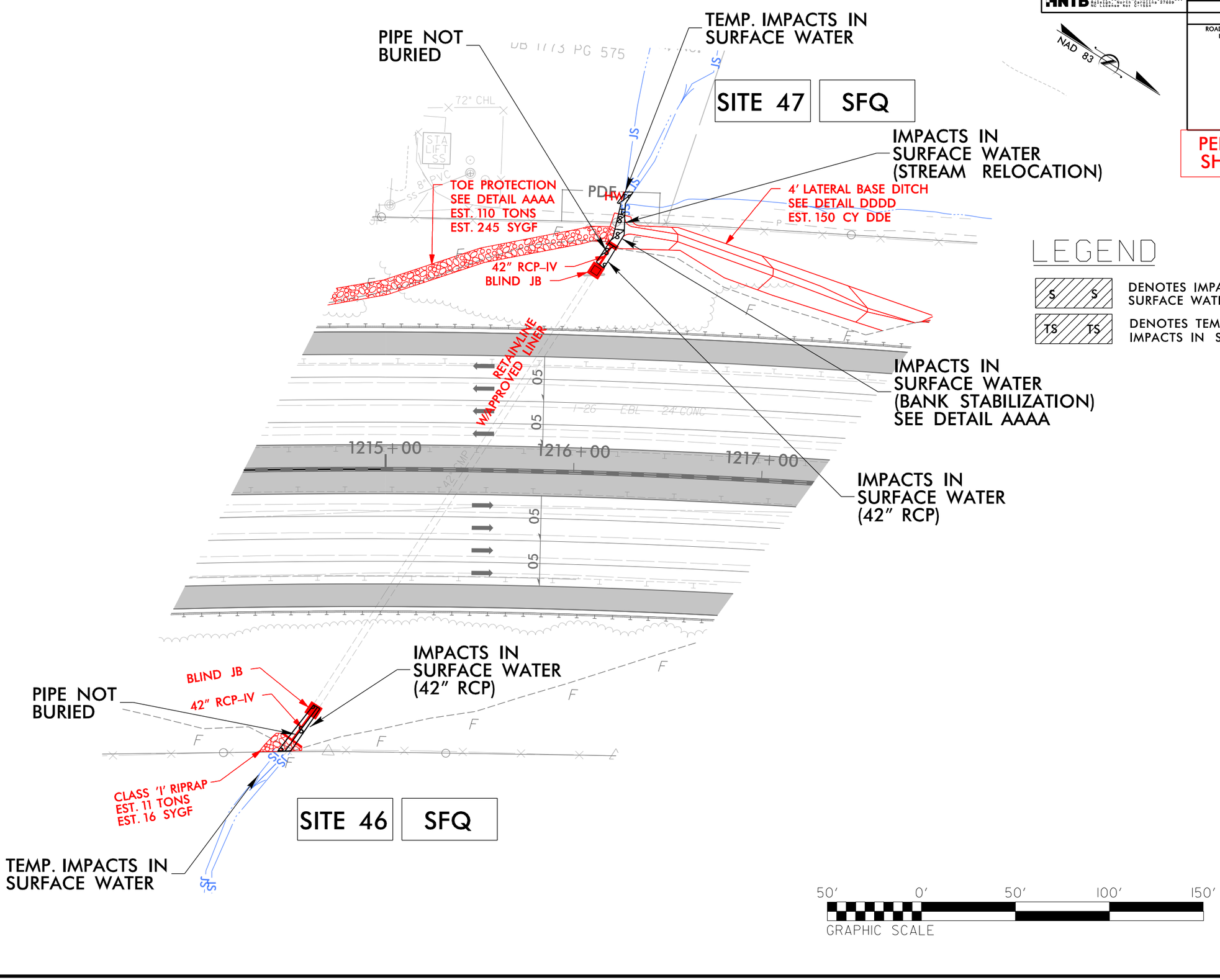
11/30/2016
I-4700B_HYD_PRM_PSH_33.dgn
HNTB

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 94 OF 97

NAD 83



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 95 OF 97

NAD 83

PIPE NOT BURIED

TEMP. IMPACTS IN SURFACE WATER

SITE 47 | SFQ

IMPACTS IN SURFACE WATER (STREAM RELOCATION)

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

PDE

HW

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

42" RCP-IV
BLIND JB

RETAINVLINE W/APPROVED LINER

IMPACTS IN SURFACE WATER (BANK STABILIZATION) SEE DETAIL AAAA

1215+00 1216+00 1217+00

IMPACTS IN SURFACE WATER (42" RCP)

IMPACTS IN SURFACE WATER (42" RCP)

BLIND JB

42" RCP-IV

PIPE NOT BURIED

CLASS 'I' RIPRAP
EST. 11 TONS
EST. 16 SYGF

SITE 46 | SFQ

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

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	Temp. Impact for Constructing Tapered Inlet with Head Wall									5	
8	UT to French Broad River / SDF	EBL 931+83 to 931+95 Median	54" CSP between two Existing 54" RCP in the Median								38		
9	UT to French Broad River / SDF	EBL 932+08 to 932+17 LT	54" RCP Extension Due to Roadway Widening and Conc.								20		
9	UT to French Broad River / SDF	EBL 932+12 to 932+23 LT	Bank Stabilization at the outlet of Proposed 54" RCP Extension								22	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 with a 60" RCP Due to Roadway Widening								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 with a 60" 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	151	

*Rounded totals are sum of actual impacts

NOTES:
*1: Emedding Riprap

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
5/13/2019
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+37 to 1092+04 RT	Proposed 42" CMP Extension with a 42" RCP due to Roadway Widening								59	10	
24	UT to French Broad River / SDX	WBL 1094+12 to 1094+46 median	Channel Change*1 at Outlet of Existing 42" CMP								27	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+45 to 1105+52 RT	Channel Change*1 at Outlet of Existing 30" CMP								7	10	
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	
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	20	
30	UT to French Broad River / SDX	WBL 1118+67 to 1119+51 LT	Existing 66" CMP Extension with a 66" RCP Due to Roadway Widening								70	10	
31	UT to French Broad River / SDX	WBL 1120+78 to 1121+11 RT	Existing 66" CMP Extension with a 66" RCP Due to Roadway Widening								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	Existing 54" CMP Extension with a 54" RCP Due to Roadway Widening								57	7	
33	UT to French Broad River / SEQ	EBL 1131+02 to 1131+11 LT	Stream relocated to Existing 54" CMP with a 54" RCP Extension								24	10	
33	UT to French Broad River / SEQ	EBL 1131+00 to 1131+12 LT	Existing 54" CMP Extension with a 54" RCP Due to Roadway Widening								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+58 to 1196+84 RT	Channel Change*1 at Outlet of Existing 48" CMP								15	20	
45	UT to French Broad River / SFR	L 1196+68 to 1196+73 LT	Temp. Impact for Constructing Tapered Inlet with Head Wall									5	
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				1339	1414	
TOTALS FOR I-4700:				0.67		0.07	0.82				2903	1565	

*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
5/13/2019
Buncombe & Henderson County
I-4700

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7/24/2017

TIP PROJECT: I-4400BB

CONTRACT: C204265

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

HENDERSON COUNTY

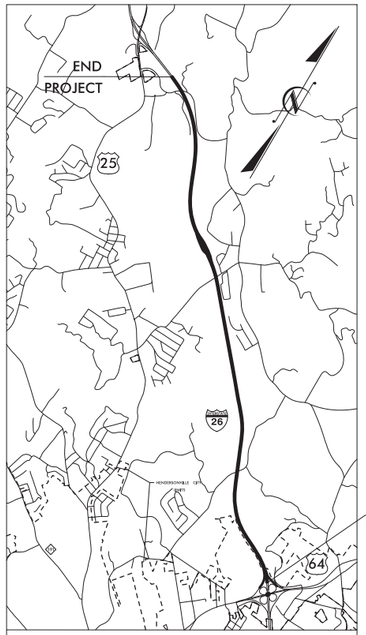
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-4400BB	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34232.1.6	NHP-0026(015)	I-4400BB (P.E.)
34232.2.10	N/A	I-4400BB (R/W/UTIL)
34232.3.GV8	NHP-0026(015)	I-4400BB (CONST.)

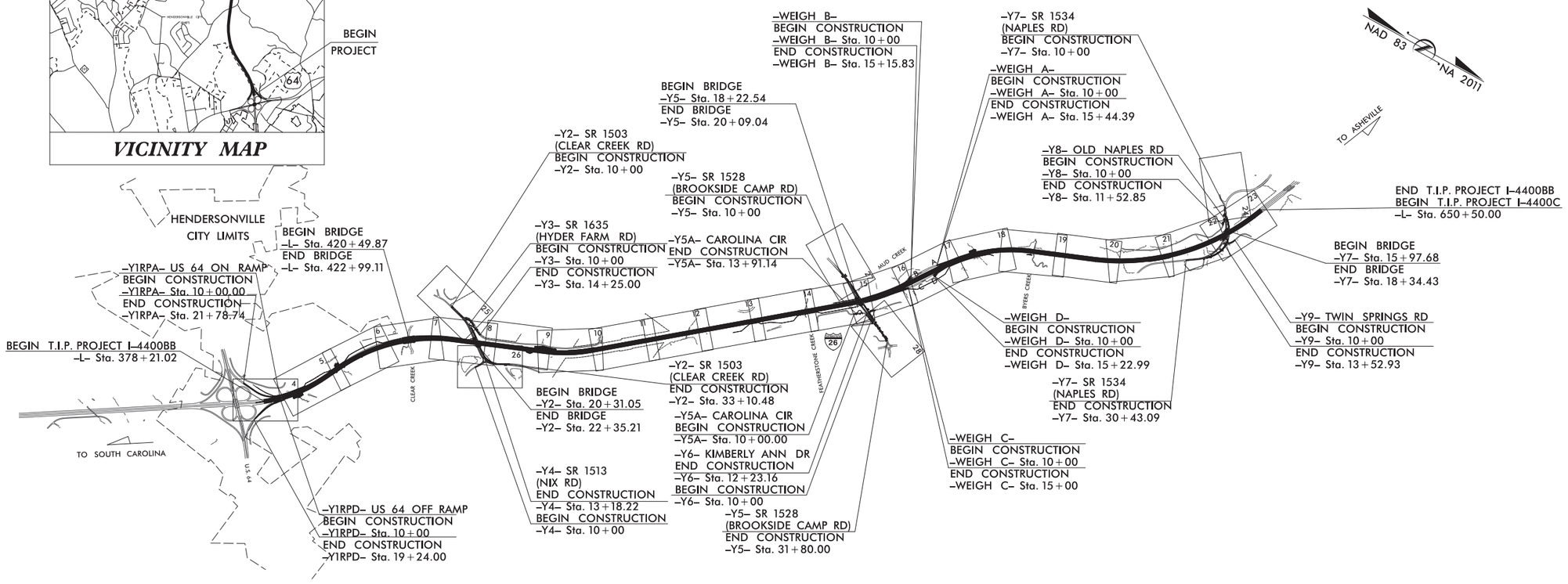
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

LOCATION: I-26 FROM US 64 TO SOUTH OF US 25 (ASHEVILLE HIGHWAY)

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



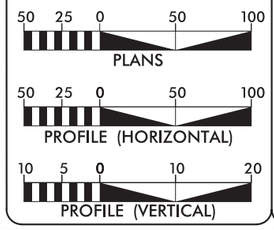
VICINITY MAP



NOTE:
1. THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES



DESIGN DATA

ADT 2019 = 63,900
ADT 2040 = 91,000
K = 10%
D = 55%
T = 15% *
V = 70 MPH
* TTST = 11% DUAL 4%

FUNC CLASS = INTERSTATE
STATEWIDE TIER

PROJECT LENGTH

TOTAL LENGTH OF ROADWAY TIP PROJECT

I-4400BB = 5.068 MI

TOTAL LENGTH OF STRUCTURES OF TIP PROJECT

I-4400BB = 0.047 MI

TOTAL LENGTH OF TIP PROJECT

I-4400BB = 5.115 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:
February 2019

LETTING DATE:
September 17, 2019

JOSEPH OLSON, P.E.
PROJECT ENGINEER

MATTHEW KIRBY, 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 •

7/24/2017
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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-4400BB	1A

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047262 ENGINEER MATTHEW D. KIRBY

DocuSigned by: Matthew D. Kirby 19
DAFC29BE7AB94EB...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

GENERAL NOTES: 2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED:

GRADING AND SURFACING OR RESURFACING AND WIDENING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.05 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.02

SIDE ROADS:

THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

SHOULDER DRAINS:

SHOULDER DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 816.03 AND DETAILS IN PLANS AT LOCATIONS DIRECTED BY THE ENGINEER.

DRIVEWAYS:

DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.02 USING 3 FOOT RADII OR RADII AS SHOWN ON THE PLANS. LOCATIONS OF DRIVES WILL BE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

STREET TURNOUT:

STREET RETURNS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 848.04 USING THE RADII NOTED ON PLANS.

GUARDRAIL:

THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL.

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACT PRICE FOR "TEMPORARY SHORING".

END BENTS:

THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE

.DUKE POWER - POWER(DISTRIBUTION)
.ATT - COMMUNICATIONS
.CHARTER - COMMUNICATIONS
.PSNC - GAS
.CITY OF ASHEVILLE - WATER
.MSD ENGINEERING - SEWER

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS EXCEPT AS SHOWN ON PLANS.

RIGHT-OF-WAY MARKERS:

ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY OTHERS.

FENCING:

ALL EXISTING C/A FENCE TO BE REMOVED.

NOTE:
IN LOCATIONS WHERE GUARDRAIL CROSSES ABOVE DRAINAGE PIPES, THE CONTRACTOR SHALL EMBED THE POSTS 3.5' PER THE STANDARD DETAILS. DEPTHS GREATER THAN 3.5' MAY INTERFERE WITH DRAINAGE PIPES.

2018 ROADWAY ENGLISH STANDARD DRAWINGS EFF. 01-16-2018
REV.

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2018 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
225.01	Guide for Grading Subgrade - Interstate and Freeway
225.02	Guide for Grading Subgrade - Secondary and Local
225.03	Deceleration and Acceleration Lanes
225.04	Method of Obtaining Superelevation - Two Lane Pavement
225.05	Method of Obtaining Superelevation - Divided Highways
225.06	Method of Grading Sight Distance at Intersections
225.09	Guide for Shoulder and Ditch Transition at Grade Separations
275.01	Rock Plating
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
422.01	Bridge Approach Fills - Type I Standard Approach Fill
422.03	Reinforced Bridge Approach Fills - Type A Alternate Approach Fill for Integral Abutment
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.02	Method of Shoulder Construction - High Side of Superelevated Curve - Method II
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
610.01	Guide for Paving Shoulders Under Bridges - Method I
654.01	Pavement Repairs
665.01	Asphalt Shoulders - Milled Rumble Strips
DIVISION 7 - CONCRETE PAVEMENTS AND SHOULDERS	
700.01	Concrete Pavement Joints - Construction and Contraction Joints
700.02	Expansion Joint Layout - for Rigid Doweled Pavement at Bridges
700.03	Dowel Assembly
700.04	Concrete Pavement Header Board
700.05	Tying Proposed Pavement to Existing
710.01	Concrete Pavement - Station Marking
DIVISION 8 - INCIDENTALS	
816.01	Concrete Pads - for Shoulder Drain Installation
816.02	Aggregate Shoulder Drain
816.03	Geocomposite Shoulder Drain
816.04	Markers for Drainage Structure and Concrete Pad
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.21	Reinforced Concrete Endwall - for Single 54" Pipe 90 Skew
838.27	Reinforced Concrete Endwall - for Single 60" Pipe 90 Skew
838.33	Reinforced Concrete Endwall - for Single 66" Pipe 90 Skew
838.39	Reinforced Concrete Endwall - for Single 72" Pipe 90 Skew
838.45	Notes for Reinforced Concrete Endwall - Std. Dwg 838.21 thru 838.40
838.51	Reinforced Brick Endwall - for Single 54" Pipe 90 Skew
838.57	Reinforced Brick Endwall - for Single 60" Pipe 90 Skew
838.63	Reinforced Brick Endwall - for Single 66" Pipe 90 Skew
838.69	Reinforced Brick Endwall - for Single 72" Pipe 90 Skew
838.75	Notes for Reinforced Brick Endwall - Std. Dwg 838.51 thru 838.70
838.80	Precast Endwalls - 12" thru 72" Pipe 90 Skew
840.00	Concrete Base Pad For Drainage Structures
840.04	Concrete Open Throat Catch Basin - 12" thru 48" Pipe
840.05	Brick Open Throat Catch Basin - 12" thru 48" Pipe
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.17	Concrete Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.20	Frames and Wide Slot Flat Grates
840.22	Frames and Wide Slot Sag Grates
840.24	Frames and Narrow Slot Sag Grates
840.26	Brick Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
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12/2/2016

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale **S.U.E. = Subsurface Utility Engineering*

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin — EIP
- Computed Property Corner
- Property Monument — ECM
- Parcel/Sequence Number — 123
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary — WLB
- Proposed Wetland Boundary — WLB
- Existing Endangered Animal Boundary — EAB
- Existing Endangered Plant Boundary — EPB
- Existing Historic Property Boundary — HPB
- Known Contamination Area: Soil — S
- Potential Contamination Area: Soil — S
- Known Contamination Area: Water — W
- Potential Contamination Area: Water — W
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign — S
- Well — W
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- Jurisdictional Stream — JS
- Buffer Zone 1 — BZ 1
- Buffer Zone 2 — BZ 2
- Flow Arrow
- Disappearing Stream
- Spring
- Wetland
- Proposed Lateral, Tail, Head Ditch — FLOW
- False Sump

RAILROADS:

- Standard Gauge — CSX TRANSPORTATION
- RR Signal Milepost — MILEPOST 35
- Switch — SWITCH
- RR Abandoned
- RR Dismantled

RIGHT OF WAY & PROJECT CONTROL:

- Secondary Horiz and Vert Control Point
- Primary Horiz Control Point
- Primary Horiz and Vert Control Point
- Exist Permanent Easment Pin and Cap
- New Permanent Easement Pin and Cap
- Vertical Benchmark
- Existing Right of Way Marker
- Existing Right of Way Line
- New Right of Way Line — RW
- New Right of Way Line with Pin and Cap — RW
- New Right of Way Line with Concrete or Granite R/W Marker — RW
- New Control of Access Line with Concrete C/A Marker — CA
- Existing Control of Access — CA
- New Control of Access — CA
- Existing Easement Line — E
- New Temporary Construction Easement — E
- New Temporary Drainage Easement — TDE
- New Permanent Drainage Easement — PDE
- New Permanent Drainage / Utility Easement — DUE
- New Permanent Utility Easement — PUE
- New Temporary Utility Easement — TUE
- New Aerial Utility Easement — AUE

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut — C
- Proposed Slope Stakes Fill — F
- Proposed Curb Ramp — CR
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard — Vineyard

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert — CONC
- Bridge Wing Wall, Head Wall and End Wall — CONC WW

MINOR:

- Head and End Wall — CONC HW
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB — CB
- Paved Ditch Gutter
- Storm Sewer Manhole — S
- Storm Sewer — S

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole — P
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole
- H-Frame Pole
- U/G Power Line LOS B (S.U.E.*) — P
- U/G Power Line LOS C (S.U.E.*) — P
- U/G Power Line LOS D (S.U.E.*) — P

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole — T
- Telephone Pedestal — T
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole — HH
- U/G Telephone Cable LOS B (S.U.E.*) — T
- U/G Telephone Cable LOS C (S.U.E.*) — T
- U/G Telephone Cable LOS D (S.U.E.*) — T
- U/G Telephone Conduit LOS B (S.U.E.*) — TC
- U/G Telephone Conduit LOS C (S.U.E.*) — TC
- U/G Telephone Conduit LOS D (S.U.E.*) — TC
- U/G Fiber Optics Cable LOS B (S.U.E.*) — T FO
- U/G Fiber Optics Cable LOS C (S.U.E.*) — T FO
- U/G Fiber Optics Cable LOS D (S.U.E.*) — T FO

WATER:

- Water Manhole — W
- Water Meter
- Water Valve
- Water Hydrant
- U/G Water Line LOS B (S.U.E*)
- U/G Water Line LOS C (S.U.E*)
- U/G Water Line LOS D (S.U.E*)
- Above Ground Water Line — A/G Water

TV:

- TV Pedestal — C
- TV Tower
- U/G TV Cable Hand Hole — HH
- U/G TV Cable LOS B (S.U.E.*) — TV
- U/G TV Cable LOS C (S.U.E.*) — TV
- U/G TV Cable LOS D (S.U.E.*) — TV
- U/G Fiber Optic Cable LOS B (S.U.E.*) — TV FO
- U/G Fiber Optic Cable LOS C (S.U.E.*) — TV FO
- U/G Fiber Optic Cable LOS D (S.U.E.*) — TV FO

GAS:

- Gas Valve
- Gas Meter
- U/G Gas Line LOS B (S.U.E.*) — G
- U/G Gas Line LOS C (S.U.E.*) — G
- U/G Gas Line LOS D (S.U.E.*) — G
- Above Ground Gas Line — A/G Gas

SANITARY SEWER:

- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line — SS
- Above Ground Sanitary Sewer — A/G Sanitary Sewer
- SS Forced Main Line LOS B (S.U.E.*) — FSS
- SS Forced Main Line LOS C (S.U.E.*) — FSS
- SS Forced Main Line LOS D (S.U.E.*) — FSS

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box — S
- Utility Unknown U/G Line LOS B (S.U.E.*) — ?UTL
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. — UST
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole LOS A (S.U.E.*)
- Abandoned According to Utility Records — AATUR
- End of Information — E.O.I.

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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-4400BB	2A-5
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047262 ENGINEER MATTHEW KIRBY

DocuSigned by: Matthew D. Kirby L9
DAFC9368TA894F8...

PAVEMENT DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 024964 ENGINEER JOSEPH HOLLAND

DocuSigned by: Joseph Holland 7/18/2019
7-9653B1656E4AE...

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REVISIONS

SHOULDER BERM GUTTER AND GUARDRAIL DETAIL

USE IN CONJUNCTION WITH TYPICAL SECTIONS NO. 1, 2, 3 & 4

–Y1RPD– STA. 11+80.00 TO –L– STA. 400+97.00 RT
–L– STA. 391+70.00 TO –L– STA. 394+20.00 LT (INVERT)
–L– STA. 403+13.00 TO STA. 408+73.00 RT
–L– STA. 404+23.00 TO STA. 406+73.00 LT (INVERT)
–L– STA. 428+18.26 TO STA. 463+16.00 LT (INVERT)
–L– STA. 436+43.00 TO STA. 440+68.00 RT
–L– STA. 449+00.00 TO STA. 462+40.00 RT
–L– STA. 470+71.25 TO STA. 473+15.00 LT (INVERT)
–L– STA. 475+50.00 TO STA. 480+25.00 RT
–L– STA. 483+90.00 TO STA. 500+00.00 RT
–L– STA. 488+48.00 TO STA. 519+10.50 LT (INVERT)
–L– STA. 506+12.50 TO STA. 511+02.00 RT
–L– STA. 518+61.00 TO STA. 523+83.00 RT
–L– STA. 524+75.00 TO STA. 548+50.00 LT (INVERT)
–L– STA. 528+79.00 TO STA. 529+50.00 RT
–L– STA. 535+83.00 TO STA. 541+80.00 RT
–WEIGH D– STA. 12+47.00 TO STA. 10+47.00 LT (INVERT)
–WEIGH A– STA. 13+31.00 RT TO –L– STA. 590+80.50 LT (INVERT)
–L– STA. 576+40.00 TO STA. 588+37.50 RT
–L– STA. 596+25.00 TO STA. 612+50.00 RT
–L– STA. 606+00.00 TO STA. 614+00.00 LT (INVERT)
–L– STA. 616+65.00 TO STA. 617+80.00 RT
–L– STA. 619+00.00 TO STA. 620+87.50 LT (INVERT)
–L– STA. 625+12.50 TO STA. 627+00.00 RT
–L– STA. 627+49.00 TO STA. 636+50.00 LT (INVERT)
–L– STA. 635+37.50 TO STA. 646+50.00 RT
–L– STA. 638+87.50 STA. 650+50.00 LT (INVERT)

OFFSET CUT WALL WITH SHOULDER BERM GUTTER AND GUARDRAIL DETAIL

USE IN CONJUNCTION WITH TYPICAL SECTION NO.2

–L– STA. 437+77.00 TO STA. 439+51.00 LT
–L– STA. 438+79.00 TO STA. 440+65.00 RT (INVERT)
–L– STA. 533+52.00 TO STA. 540+68.00 LT
–L– STA. 539+30.00 TO STA. 541+29.00 RT (INVERT)
–L– STA. 637+28.00 TO STA. 639+55.00 RT (INVERT)
–L– STA. 638+98.00 TO STA. 640+91.00 LT

NOISEWALL DETAIL AT TOP OF CUT SLOPE

USE IN CONJUNCTION WITH TYPICAL SECTIONS NO. 1 & 2

–L– STA. 391+69.27 TO STA. 399+73.84 LT (INVERT)
–L– STA. 404+22.13 TO STA. 414+98.66 LT (INVERT)
–L– STA. 506+44.65 TO STA. 511+02.57 RT
–L– STA. 513+42.57 TO STA. 523+83.67 RT
–L– STA. 528+78.65 TO STA. 539+71.88 RT
–WEIGH C– STA. 14+87.22 RT TO –WEIGH D– STA. 10+46.18 LT (INVERT)
–L– STA. 576+39.06 TO STA. 577+49.99 RT

NOISEWALL DETAIL AT EDGE OF SHOULDER

USE IN CONJUNCTION WITH TYPICAL SECTIONS NO. 1 & 2

–Y1RPA– STA. 12+86.00 RT TO –L– 385+88.00 LT (INVERT)
–L– STA. 388+32.00 TO –L– 391+69.27 LT (INVERT)
–L– STA. 399+13.83 TO STA. 404+22.13 LT (INVERT)
–L– STA. 414+98.66 TO STA. 428+11.43 LT (INVERT)
–L– STA. 511+02.57 TO STA. 513+42.57 RT
–L– STA. 523+83.67 TO STA. 528+78.65 RT
–L– STA. 541+80.45 RT TO –WEIGH C– STA. 14+87.22 RT
–WEIGH D– STA. 10+46.18 LT (INVERT) TO –L– STA. 576+39.06 RT

EXPRESSWAY GUTTER DETAIL

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 2

–L– STA. 463+36.00 TO STA. 470+25.00 LT
–L– STA. 618+00.00 TO STA. 623+80.00 RT (INVERT)

FILL WALL WITH MOMENT SLAB AND NOISEWALL DETAIL

USE IN CONJUNCTION WITH TYPICAL SECTIONS NO.1 & 2

–L– STA 385+88.00 TO STA 388+32.00 LT

SHOULDER BERM GUTTER DETAIL

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 2

–L– STA. 624+00.00 TO STA. 625+12.50 RT

EXPRESSWAY GUTTER DETAIL

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 3

–Y1RPD– STA. 11+80.00 TO STA. 14+39.00 LT

NOISEWALL DETAIL AT TOP OF CUT SLOPE

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 1 & 3

–Y1RPA– STA. 18+10.68 TO STA. 12+86.00 RT

CUT WALL DETAIL

USE IN CONJUNCTION WITH TYPICAL SECTION NO.2

–L– STA. 408+73.00 TO STA. 418+48.43 RT
–L– STA. 424+97.92 TO STA. 429+13.00 RT
–L– STA. 533+52.00 TO STA. 538+96.00 LT

FILL WALL WITH MOMENT SLAB DETAIL

USE IN CONJUNCTION WITH TYPICAL SECTIONS NO. 2 & 11

–L– STA. 400+97.00 TO STA. 403+13.00 RT
–L– STA. 422+93.11 TO STA. 424+14.01 RT

NOTE: SEE PLANS FOR SUPERELEVATIONS, TURN LANES, MONOLITHIC ISLANDS, CURB AND GUTTER, AND LANE TAPER LOCATIONS.

FILL WALL WITH MOMENT SLAB DETAIL

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 2
–L– STA. 419+88.42 TO STA. 420+52.62 RT

FILL WALL WITH MOMENT SLAB DETAIL

USE IN CONJUNCTION WITH TYPICAL SECTION NO. 2
–L– STA. 418+48.43 RT TO STA. 419+88.42 RT
–L– STA. 420+52.62 RT TO STA. 420+57.44 RT

A1	13.0" PCCP
C1	1.25" S9.5B
C3	3" S9.5B
C4	3" S9.5C
C5	1.5" S9.5C
C6	3" S9.5D
D1	2.5" I19.0C
D2	4" I19.0C
E1	4" B25.0C
E2	5" B25.0C
E3	5.5" B25.0C
E4	6.0" OR 7.25" B25.0C *
K	12" CLASS IV SUBGRADE STABILIZATION
N1	NONWOVEN GEOTEXTILE INTERLAYER
N2	GEOTEXTILE FOR SOIL STABILIZATION
R1	CONC. SHOULDER BERM GUTTER
R2	SINGLE SLOPE CONCRETE BARRIER
R3	PRECAST REINFORCED CONC. BARRIER WITH GUTTER
R4	CONC. BARRIER RAIL WITH MOMENT SLAB
R5	EXPRESSWAY GUTTER
T	EARTH MATERIAL
U	EXISTING PAVEMENT
V	INCIDENTAL MILLING
Y	MILLED RUMBLE STRIPS

PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE

*SEE SHOULDER DRAIN DETAIL SHEET 2A-2

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DITCH DETAILS

Vaughn & Melton Consulting Engineers, Inc.
10000 Associates Lane
Charlotte, NC 28217
NC License No: P-1098

Parrish and Partners of North Carolina, PLLC
10325 Community House Rd
Suite 200
Charlotte, NC 28277
NC License No: P-1212

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	2D-1

R/W SHEET NO.

HYDRAULICS ENGINEERS

NORTH CAROLINA PROFESSIONAL SEAL 047435 ENGINEER JOSEPH FORD

Docusigned by: Joseph Ford 7/12/2019 | A89D0F2837AC43C...

NORTH CAROLINA PROFESSIONAL SEAL 035700 KEVIN P. HIGGINS ENGINEER

Docusigned by: Kevin P. Higgins 7/12/2019 | E8B6D6E48FC3444...

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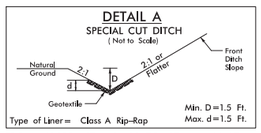
REVISIONS

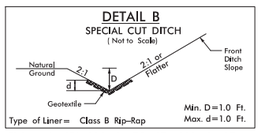
DETAIL A
SPECIAL CUT DITCH
(Not to Scale)



Type of Liner= Class A Rip–Rap

FROM –Y1RPD– STA. 12+00 TO STA. 14+00 LT

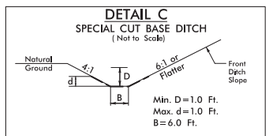
DETAIL B
SPECIAL CUT DITCH
(Not to Scale)



Type of Liner= Class B Rip–Rap

FROM –L– STA. 396+25 TO STA. 399+25 RT

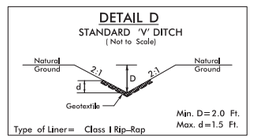
DETAIL C
SPECIAL CUT BASE DITCH
(Not to Scale)



Type of Liner= PSRM

FROM –L– STA. 468+20 TO STA. 471+50 RT

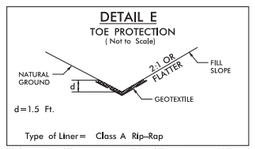
DETAIL D
STANDARD 'V' DITCH
(Not to Scale)



Type of Liner= Class I Rip–Rap

FROM –L– STA. 552+00 TO STA. 553+20 LT

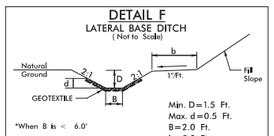
DETAIL E
TOE PROTECTION
(Not to Scale)



Type of Liner= Class A Rip–Rap

FROM –L– STA. 485+75 TO STA. 487+50 LT
FROM –L– STA. 492+70 TO STA. 494+00 LT

DETAIL F
LATERAL BASE DITCH
(Not to Scale)

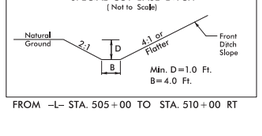


*When B is < 6.0'

Type of Liner= Class A Rip–Rap

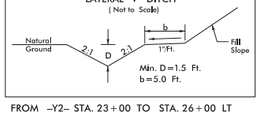
FROM –L– STA. 510+50 TO STA. 513+20 RT

DETAIL G
SPECIAL CUT BASE DITCH
(Not to Scale)



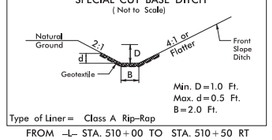
FROM –L– STA. 505+00 TO STA. 510+00 RT

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



FROM –Y2– STA. 23+00 TO STA. 26+00 LT

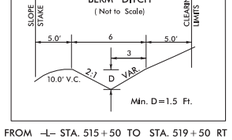
DETAIL I
SPECIAL CUT BASE DITCH
(Not to Scale)



Type of Liner= Class A Rip–Rap

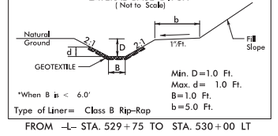
FROM –L– STA. 510+00 TO STA. 510+50 RT

DETAIL J
BERM DITCH
(Not to Scale)



FROM –L– STA. 515+50 TO STA. 519+50 RT

DETAIL K1
LATERAL BASE DITCH
(Not to Scale)

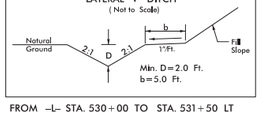


*When B is < 6.0'

Type of Liner= Class B Rip–Rap

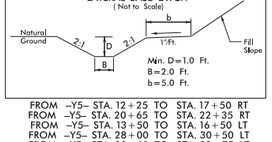
FROM –L– STA. 529+75 TO STA. 530+00 LT

DETAIL K2
LATERAL 'V' DITCH
(Not to Scale)



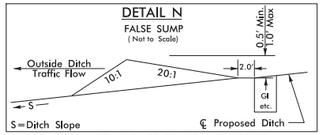
FROM –L– STA. 530+00 TO STA. 531+50 LT

DETAIL L
LATERAL BASE DITCH
(Not to Scale)



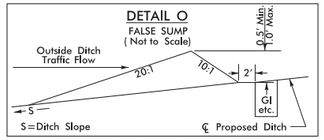
FROM –Y5– STA. 12+25 TO STA. 17+50 RT
FROM –Y5– STA. 20+65 TO STA. 22+35 RT
FROM –Y5– STA. 13+50 TO STA. 16+50 LT
FROM –Y5– STA. 28+00 TO STA. 30+50 LT
FROM –Y5– STA. 20+60 TO STA. 22+75 LT

DETAIL N
FALSE SUMP
(Not to Scale)



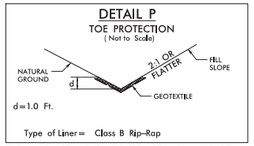
FROM STA. 407+70 TO STA. 407+85 RT
FROM STA. 437+50 TO STA. 437+65 LT
FROM STA. 437+60 TO STA. 437+75 LT
FROM STA. 468+15 TO STA. 468+30 RT
FROM STA. 471+55 TO STA. 471+70 RT
FROM STA. 474+75 TO STA. 474+90 RT
FROM STA. 475+92 TO STA. 476+07 RT
FROM STA. 519+50 TO STA. 519+65 RT
FROM STA. 577+80 TO STA. 577+95 RT
FROM STA. 581+20 TO STA. 581+35 RT
FROM STA. 585+00 TO STA. 585+15 RT

DETAIL O
FALSE SUMP
(Not to Scale)



FROM STA. 410+75 TO STA. 410+90 LT
FROM STA. 429+10 TO STA. 429+25 RT
FROM STA. 418+10 TO STA. 418+25 LT
FROM STA. 434+40 TO STA. 434+55 RT
FROM STA. 438+35 TO STA. 438+50 RT
FROM STA. 475+98 TO STA. 476+13 LT
FROM STA. 483+90 TO STA. 484+05 LT
FROM STA. 538+35 TO STA. 538+50 RT
FROM STA. 546+80 TO STA. 546+95 RT
FROM STA. 581+20 TO STA. 581+35 LT
FROM STA. 582+75 TO STA. 582+90 LT

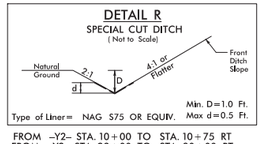
DETAIL P
TOE PROTECTION
(Not to Scale)



Type of Liner= Class B Rip–Rap

FROM –L– STA. 542+75 TO STA. 544+00 RT
FROM –L– STA. 545+25 TO STA. 546+50 RT
FROM –L– STA. 567+00 TO STA. 567+75 RT
FROM –L– STA. 583+00 TO STA. 583+50 LT
FROM –Y5– STA. 17+50 TO STA. 17+75 RT
FROM –Y5– STA. 16+50 TO STA. 18+15 LT
FROM –Y5– STA. 20+60 TO STA. 22+75 LT

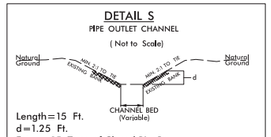
DETAIL R
SPECIAL CUT DITCH
(Not to Scale)



Type of Liner= NAG S75 OR EQUIV.

FROM –Y2– STA. 10+00 TO STA. 10+75 RT
FROM –Y2– STA. 29+00 TO STA. 30+00 RT

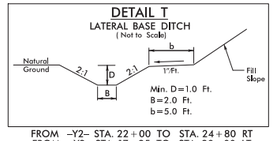
DETAIL S
PIPE OUTLET CHANNEL
(Not to Scale)



Length=15 Ft.
d=1.25 Ft.
Est.= 15 Tons of Class I Rip–Rap

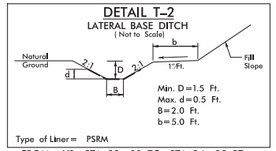
FROM –L– STA. 551+70 TO STA. 551+80 LT
FROM –L– STA. 389+50 TO STA. 389+60 RT
FROM –Y2– STA. 24+80 TO STA. 24+90 LT
FROM –L– STA. 456+60 TO STA. 456+70 LT
FROM –L– STA. 557+90 TO STA. 558+00 LT
FROM –L– STA. 572+70 TO STA. 572+80 LT

DETAIL T
LATERAL BASE DITCH
(Not to Scale)



FROM –Y2– STA. 22+00 TO STA. 24+80 RT
FROM –Y2– STA. 17+25 TO STA. 20+00 LT
FROM –Y3– STA. 11+00 TO STA. 14+00 IT

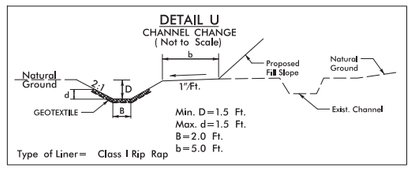
DETAIL T–2
LATERAL BASE DITCH
(Not to Scale)



Type of Liner= PSRM

FROM –Y2– STA. 22+00 TO STA. 24+85 RT

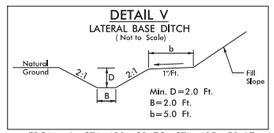
DETAIL U
CHANNEL CHANGE
(Not to Scale)



Type of Liner= Class I Rip Rap

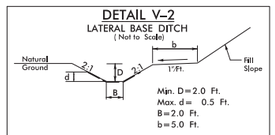
FROM –L– STA. 572+25 TO STA. 573+80 RT
FROM –L– STA. 583+75 TO STA. 585+00 LT

DETAIL V
LATERAL BASE DITCH
(Not to Scale)



FROM –L– STA. 433+50 TO STA. 435+50 LT
FROM –Y2– STA. 27+30 TO STA. 29+00 RT

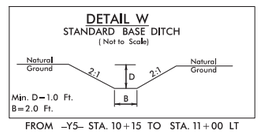
DETAIL V–2
LATERAL BASE DITCH
(Not to Scale)



Type of Liner= NAG SC150 OR EQUIVALENT

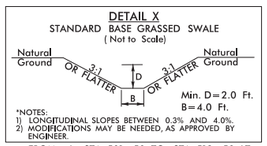
FROM –Y2– STA. 27+30 TO STA. 29+00 RT

DETAIL W
STANDARD BASE DITCH
(Not to Scale)



FROM –Y5– STA. 10+15 TO STA. 11+00 LT

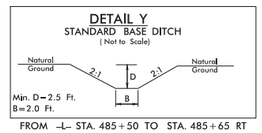
DETAIL X
STANDARD BASE GRASSED SWALE
(Not to Scale)



*NOTES:
1) LONGITUDINAL SLOPES BETWEEN 0.3% AND 4.0%.
2) MODIFICATIONS MAY BE NEEDED, AS APPROVED BY ENGINEER.

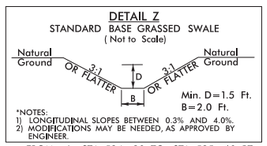
FROM –L– STA. 501+50 TO STA. 518+50 LT
FROM –L– STA. 513+00 TO STA. 518+50 LT

DETAIL Y
STANDARD BASE DITCH
(Not to Scale)



FROM –L– STA. 485+50 TO STA. 485+65 RT

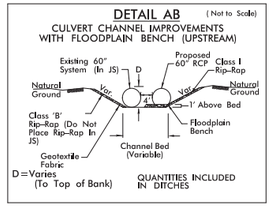
DETAIL Z
STANDARD BASE GRASSED SWALE
(Not to Scale)



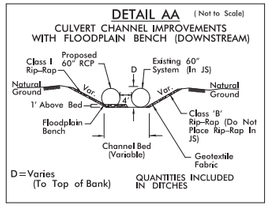
*NOTES:
1) LONGITUDINAL SLOPES BETWEEN 0.3% AND 4.0%.
2) MODIFICATIONS MAY BE NEEDED, AS APPROVED BY ENGINEER.

FROM –L– STA. 524+20 TO STA. 525+60 RT
FROM –L– STA. 524+75 TO STA. 526+05 LT

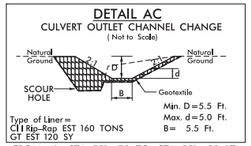
DETAIL AB
(Not to Scale)
CULVERT CHANNEL IMPROVEMENTS
WITH FLOODPLAIN BENCH (UPSTREAM)



DETAIL AA
(Not to Scale)
CULVERT CHANNEL IMPROVEMENTS
WITH FLOODPLAIN BENCH (DOWNSTREAM)



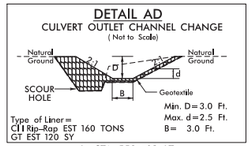
DETAIL AC
CULVERT OUTLET CHANNEL CHANGE
(Not to Scale)



Type of Liner= CLI Rip–Rap EST 160 TONS GT EST 120 SY
Min. D=5.5 Ft.
Max. d=5.0 Ft.
B= 5.5 Ft.

FROM –L– STA. 551+70 TO STA. 551+80 LT
–L– STA. 572+75 LT

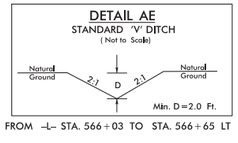
DETAIL AD
CULVERT OUTLET CHANNEL CHANGE
(Not to Scale)



Type of Liner= CLI Rip–Rap EST 160 TONS GT EST 120 SY
Min. D=3.0 Ft.
Max. d=2.5 Ft.
B= 3.0 Ft.

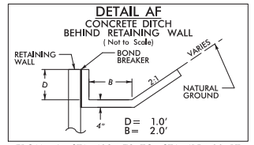
–L– STA. 558+02 LT

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



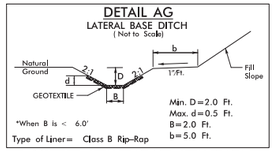
FROM –L– STA. 566+03 TO STA. 566+65 LT

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



FROM –L– STA. 408+73 TO STA. 415+00 RT
FROM –L– STA. 415+00 TO STA. 418+65 RT
FROM –L– STA. 438+79 TO STA. 440+65 RT
FROM –L– STA. 437+77 TO STA. 439+51 LT
FROM –L– STA. 533+52 TO STA. 539+00 LT
FROM –L– STA. 533+30 TO STA. 541+29 RT
FROM –L– STA. 539+00 TO STA. 540+68 LT

DETAIL AG
LATERAL BASE DITCH
(Not to Scale)

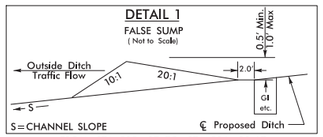


*When B is < 6.0'

Type of Liner= Class B Rip–Rap

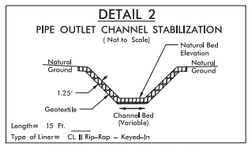
FROM –L– STA. 433+50 TO STA. 435+50 LT

DETAIL 1
FALSE SUMP
(Not to Scale)



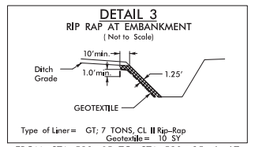
FROM STA. 595+97 TO STA. 596+29 LT
FROM STA. 595+97 TO STA. 596+29 RT
FROM STA. 602+46 TO STA. 602+63 LT

DETAIL 2
PIPE OUTLET CHANNEL STABILIZATION
(Not to Scale)



STA. 590+17 TO STA. 590+02

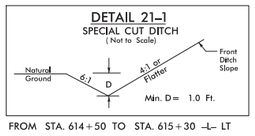
DETAIL 3
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner= GT; 7 TONS, CL II Rip–Rap
Geotextile= 10 SY

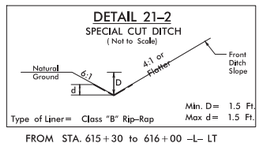
FROM STA. 590+15 TO STA. 590+35 –L– LT

DETAIL 21–1
SPECIAL CUT DITCH
(Not to Scale)



FROM STA. 614+50 TO STA. 615+30 –L– LT

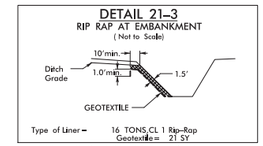
DETAIL 21–2
SPECIAL CUT DITCH
(Not to Scale)



Type of Liner= Class "B" Rip–Rap

FROM STA. 615+30 to 616+00 –L– LT

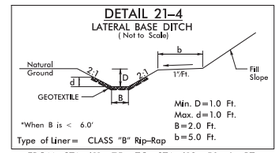
DETAIL 21–3
RIP RAP AT EMBANKMENT
(Not to Scale)



Type of Liner= 16 TONS,CL 1 Rip–Rap
Geotextile= 21 SY

FROM STA. 611+64 TO STA. 611+85 –L– RT

DETAIL 21–4
LATERAL BASE DITCH
(Not to Scale)



*When B is < 6.0'

Type of Liner= CLASS "B" Rip–Rap

FROM STA. 611+75 TO STA. 613+50 –L– RT

12-JUL-2019 09:10
p:\pdd\charlotte_org\PWSED\v\Documents\Charlotte Projects\60645 - 14400 - 4700/I-4400 BB/Roadway/Proj\14400BB_RDY_DrainageDetails.dgn
Cristina Tomich AT

DocuSign Envelope ID: 2677AAB7-821B-4C1E-A1FD-5F7A63D789BC

DITCH DETAILS

Vaughn & Melton Consulting Engineers, Inc.
10001 Associates Lane
Huntersville, NC 28078
NC License No: P-1088

Parrish and Partners of North Carolina, PLLC
13025 Ballantyne Corporate Place
Suite 200
Charlotte, NC 28277
NC License No: P-1212

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	2D-2

R/W SHEET NO.

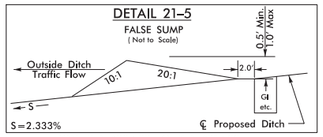
HYDRAULICS ENGINEERS

NORTH CAROLINA PROFESSIONAL SEAL 047435 ENGINEER JOSEPH FORD
Docusigned by: 12/12/2019
ABBDF3E27A8C4F...

NORTH CAROLINA PROFESSIONAL SEAL 035700 ENGINEER KEVIN COGGINS
Docusigned by: 12/12/2019
6B8B05E8EF5244...

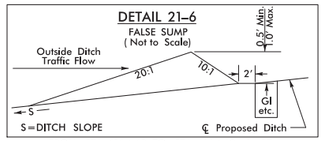
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DETAIL 21–5
FALSE SUMP (Not to Scale)



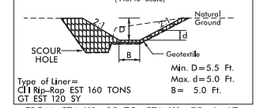
FROM STA. 620+80 TO STA. 621+00 –L– LT

DETAIL 21–6
FALSE SUMP (Not to Scale)



FROM STA. 616+43 TO STA. 616+63 –L– RT

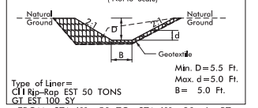
DETAIL 21–7
CULVERT OUTLET CHANNEL CHANGE (Not to Scale)



Type of Liner= CL I Rip-Rap EST 160 TONS GT EST 120 SY
Min. D=5.5 Ft.
Max. d=5.0 Ft.
B= 5.0 Ft.

FROM STA.611+35 TO STA.611+75 –L– LT

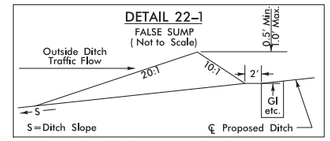
DETAIL 21–8
CULVERT INTLET CHANNEL CHANGE (Not to Scale)



Type of Liner= CL I Rip-Rap EST 50 TONS GT EST 100 SY
Min. D=5.5 Ft.
Max. d=5.0 Ft.
B= 5.0 Ft.

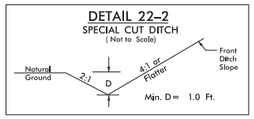
FROM STA.611+50 TO STA.611+80 –L– RT

DETAIL 22–1
FALSE SUMP (Not to Scale)



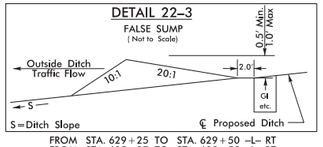
FROM STA. 623+80 TO STA. 624+00 –L– RT
FROM STA. 635+30 TO STA. 635+60 –L– LT
FROM STA. 636+50 TO STA. 636+80 –L– LT

DETAIL 22–2
SPECIAL CUT DITCH (Not to Scale)



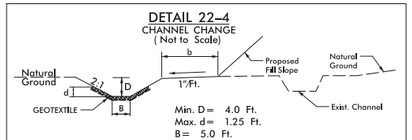
FROM STA. 624+00 TO STA. 623+25

DETAIL 22–3
FALSE SUMP (Not to Scale)



FROM STA. 629+25 TO STA. 629+50 –L– RT
FROM STA. 635+27 TO STA. 635+55 –L– RT
FROM STA. 22+05 TO STA. 22+30–Y7– LT

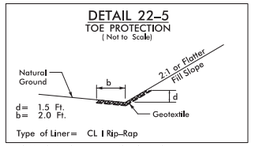
DETAIL 22–4
CHANNEL CHANGE (Not to Scale)



Min. D= 4.0 Ft.
Max. d= 1.25 Ft.
B= 5.0 Ft.
b= 5.0 Ft.
Type of Liner= CLASS I RR

FROM STA. 10+00 TO STA. 30+00 48" OUTFALL
FROM STA. 10+00 TO STA 40+00 48" INLET

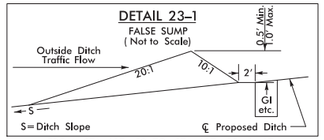
DETAIL 22–5
TOE PROTECTION (Not to Scale)



d= 1.5 Ft.
b= 2.0 Ft.
Type of Liner= CL I Rip-Rap

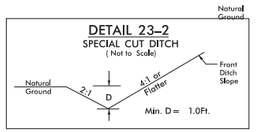
FROM STA. 627+52 TO STA. 628+20 –L– LT

DETAIL 23–1
FALSE SUMP (Not to Scale)



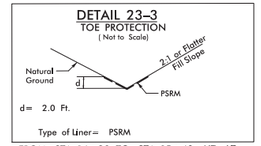
FROM STA. 637+52 TO STA. 637+85 –L– LT

DETAIL 23–2
SPECIAL CUT DITCH (Not to Scale)



FROM STA. 641+00 TO STA. 642+22 –L– RT
FROM STA. 10+50 TO STA. 11+00 –Y9– LT

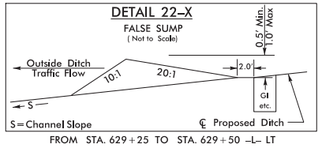
DETAIL 23–3
TOE PROTECTION (Not to Scale)



d= 2.0 Ft.
Type of Liner= PSRM

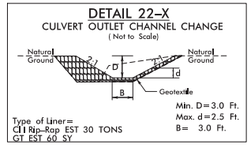
FROM STA. 14+20 TO STA. 15+40 –Y7– LT

DETAIL 22–X
FALSE SUMP (Not to Scale)



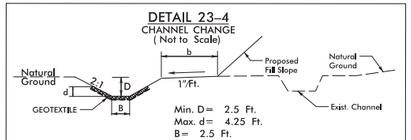
FROM STA. 629+25 TO STA. 629+50 –L– LT

DETAIL 22–X
CULVERT OUTLET CHANNEL CHANGE (Not to Scale)



Type of Liner= CL I Rip-Rap EST 30 TONS GT EST 60 SY
Min. D=3.0 Ft.
Max. d=2.5 Ft.
B= 3.0 Ft.

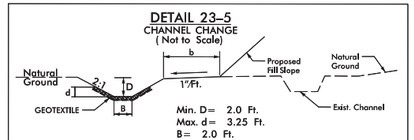
DETAIL 23–4
CHANNEL CHANGE (Not to Scale)



Min. D= 2.5 Ft.
Max. d= 4.25 Ft.
B= 2.5 Ft.
b= 3.0 Ft.
Type of Liner= CLASS I RR

FROM STA. 646+10 TO STA. 646+30

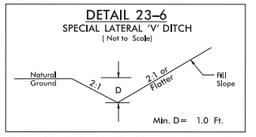
DETAIL 23–5
CHANNEL CHANGE (Not to Scale)



Min. D= 2.0 Ft.
Max. d= 3.25 Ft.
B= 2.0 Ft.
b= 3.0 Ft.
Type of Liner= CLASS I RR

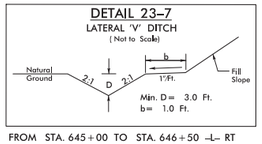
FROM STA. 648+66 TO STA. 648+86

DETAIL 23–6
SPECIAL LATERAL 'V' DITCH (Not to Scale)



FROM STA. 643+50 TO STA. 645+00 –L– RT
FROM STA. 642+28 TO STA. 643+50 –L– RT

DETAIL 23–7
LATERAL 'V' DITCH (Not to Scale)



FROM STA. 645+00 TO STA. 646+50 –L– RT

REVISIONS

11-JUL-2019 19:06
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mkibby
//nemb.org/PWSED/v/Documents/Charlotte Projects/60645 - 14400 - 4700/I-4400 BB/Roadway/Proj/I4400BB_RDY_DrainageDetails.dgn

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PIPE DETAIL

NOT TO SCALE

GENERAL NOTES

USE 4000 PSI MINIMUM COMPRESSIVE STRENGTH CONCRETE.

DESIGN, FABRICATE AND ASSEMBLE PRECAST MANHOLE COMPONENTS IN ACCORDANCE WITH AASHTO M199.

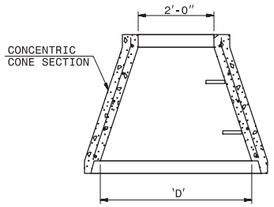
ASSEMBLE RISER AND GRADE RINGS WITH STEPS SPACED 16″ FROM THE TOP TO THE BOTTOM OF THE MANHOLE.

WHERE THE MANHOLE IS EXPOSED TO ROAD TRAFFIC, THE TOP OF THE MANHOLE IS TO BE FLUSH WITH THE GROUND. AT OTHER LOCATIONS IT SHOULD BE A MINIMUM OF 9″ ABOVE THE GROUND.

DEPTH OF FILL LIMITED TO 30′-0″ FROM FINSH GRADE TO TOP OF BOTTOM SLAB.

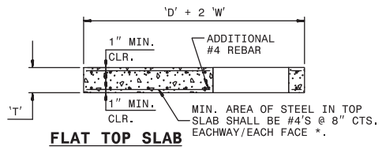
THE MIN. SLAB THICKNESS 'T' SHALL BE THE DIMENSION OF THE THINNEST PORTION OF THE TOP/BOTTOM SLAB.

* TOP MAT OF REINFORCEMENT MAY BE NEGLECTED IF TOP SLAB HAS A DISTINGUISHABLE TOP AND BOTTOM.



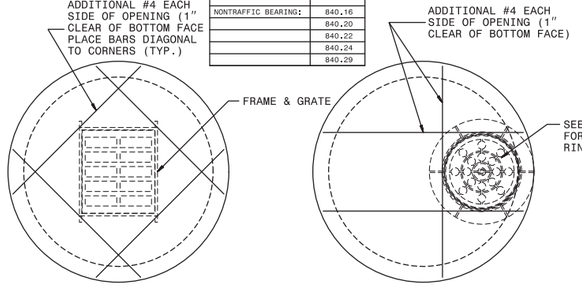
D	W	T	As
INTERNAL DIAMETER (FT.)	MIN. WALL THICKNESS (IN.)	MIN. TOP/BOTTOM SLAB THICKNESS (IN.)	MIN. CIRCUMFERENTIAL AREA OF STEEL PER VERTICAL FT. (SQ. IN.)
7	8.0	8	0.21
8	8.5	8	0.24
9	9.0	9	0.27

ALTERNATE CONE SECTION

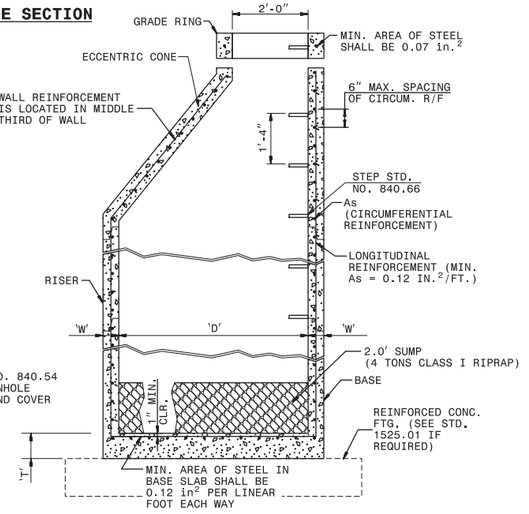


FLAT TOP SLAB

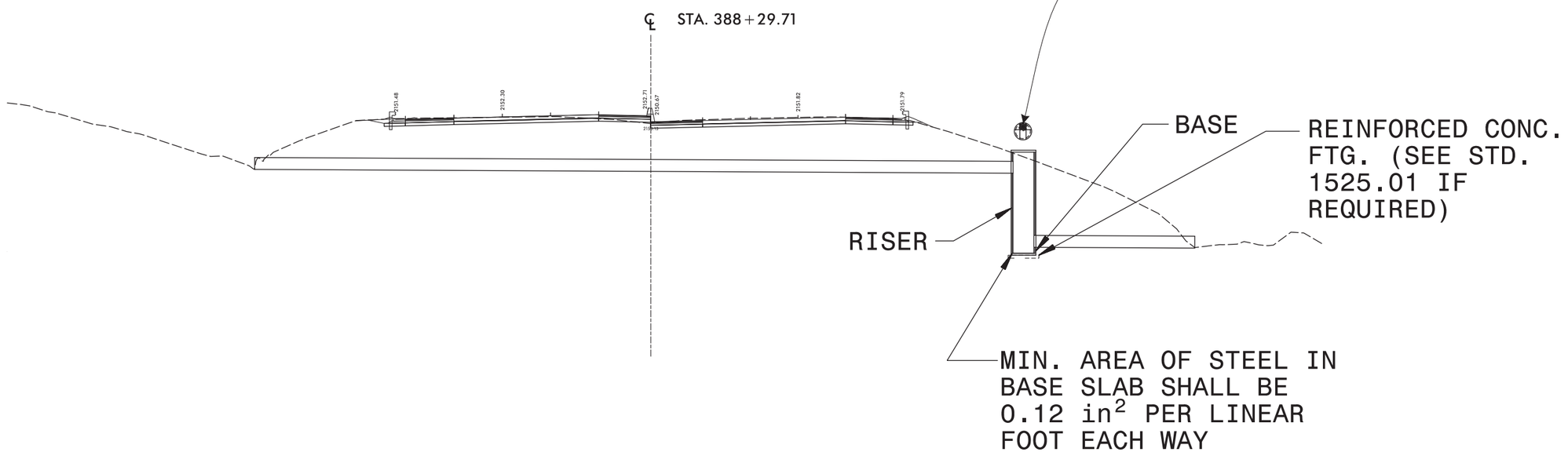
FRAME AND GRATES	STD. NO.
TRAFFIC BEARING	840.37
NONTRAFFIC BEARING:	840.16
	840.20
	840.22
	840.24
	840.29



GRATED INLET OPTION **MANHOLE OPTION**



TYPICAL MANHOLE SECTION



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

Vaughn & Melton Consulting Engineers, Inc.
1800E Associates Lane
Charlotte, NC 28217
NC License No: F-1088

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	2D-3
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047262 ENGINEER MATTHEW KIRBY
DocuSigned by: Matthew D. Kirby 19
DAFC3960A6B4FB...

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047435 ENGINEER JON FORD
DocuSigned by: Jon Ford 7/12/2019
4B90D5B27A8D4A5...

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REVISIONS

12-JUL-2019 09:00
pw://pw-intshntb.orgPWSEDiv/Documents/Charlotte Projects/60645 - 14400 - 4700/I-4400 BB/Roadway/Proj/14400BB_RDY_DTL_2D-3.dgn
czimmowitch AT
$$SCALE$$
$$ENVIRONMENT$$

HNTB	HNTB NORTH CAROLINA, P.C. 343 E. Six Forks Road, Suite 200 Raleigh, North Carolina 27609 NC License No: C-1554
V&M Vaughn & Melton Consulting Engineers	Vaughn & Melton Consulting Engineers, Inc. 1800E Associates Lane Charlotte, NC 28217 NC License No: F-1088

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047262 ENGINEER MATTHEW J. KIRBY

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047435 ENGINEER JON C. FORD

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REVISIONS

NAD 83 / NA 2011

LAKE POINTE LANDING RETIREMENT INVESTORS, LLC
DB 1044 PG 298
DB 1044 PG 300

CAROLINA VILLAGE, INC.
DB 1341PG 582
DB 1077 PG 350

JUNE STEPP-ROGERS
DB 3025 PG 79
DB 3025 PG 83

SR 1634 CAROLINA VILLAGE RD 21' BST

SR 1634 CAROLINA VILLAGE RD 22' BST

SR 1516 FRANCIS RD 21' BST

US 64 EB CHIMNEY ROCK RD 38' BST

US 64 WB CHIMNEY ROCK RD 38' BST

I-26 EB 45.5' CONC

I-26 WB 50' CONC

I-26 EB 38.5' CONC

I-26 WB 38.5' CONC

I-26 WB 44' CONC

BM #36

BM #39

BM #40

BM #7

BM #41

BEGIN WW FENCE +89.44, 140.81' RT -RPA- 42" RCP

-Y1-RPA- ST Sta. 18+69.13

-Y1-RPA- CS Sta. 16+77.13

END CONSTRUCTION -Y1-RPA- PC Sta. 21+59.41

-L- TS Sta. 375+47.92

-L- SC Sta. 377+72.92

BEGIN T.I.P. PROJECT I-4400BB -L- Sta. 378+21.02

TIE TO EXISTING GUARDRAIL -L- STA. 378+21.02

PROP. GUARDRAIL: TYPE 3

-Y1-RPD- CS Sta. 18+12.72

-Y1-RPD- ST Sta. 20+04.72

END CONSTRUCTION -Y1-RPD- PC Sta. 21+11.35

-Y1-RPD- SC Sta. 14+16.00

-Y1-RPD- TS Sta. 12+24.00

-Y1-RPD- ST Sta. 10+96.00

-Y1-RPA- CS Sta. 10+00.00
-L- Sta. 385+95.87, 49.00' LT.

-Y1-RPA- SC Sta. 11+92.00

BEGIN PRECAST REINFORCED CONC. BARRIER +86.00

END PRECAST REINFORCED CONCRETE BARRIER
BEGIN RETAINING WALL -RW13-
BEGIN CONC. BARRIER RAIL W/MOMENT SLAB & NOISE WALL
-L- STA. 385+88.00, 76.52' LT

MATCHLINE SHEET 5
-L- STA 387+00.00

575' DECELERATION LANE

890' ACCELERATION LANE

SINGLE SLOPE CONC. BARRIER

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

CLASS I RIPRAP EST. 11 TONS EST. 22 SYGF

15" CSP W/ELBOWS AND ROD AND LUG CONNECTORS

PLUG & FILL w/ FLOWABLE FILL

SPECIAL CUT DITCH SEE DETAIL A EST. 56 TONS EST. 721 SYGF

GREU TL-3

BEGIN SHOULDER BERM GUTTER +80.00 -Y1-RPD-

20' GUTTER TRANSITION

END EXPRESSWAY GUTTER +71.00 -Y1-RPD-

BEGIN EXPRESSWAY GUTTER
BEGIN 50:1 GUARDRAIL TAPER
+00.00 -Y1-RPD-

COIR FIBER LINER EST. 163 SYGF

BEGIN WW FENCE +26.74, 395.97' RT

GREGORY M. ALBEA
DB 931PG 30
DB 960 PG 179

FOR –Y1–RPA– & –Y1–RPD– CURVE DATA, SEE SHEET 2B–2
FOR –L– CURVE DATA, SEE SHEET 2B–1
FOR –Y1–RPA– & –Y1–RPD– PROFILES, SEE SHEET 52
FOR –L– PROFILE, SEE SHEET 29 & 30
FOR SPECIAL DITCH DETAILS, SEE SHEET 2D–1

06-AUG-2019 09:41
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Charlotte, NC 28217
NC License No: F-1088

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	5
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047262 ENGINEER MATTHEW J. KIRBY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047435 ENGINEER JON C. FORD

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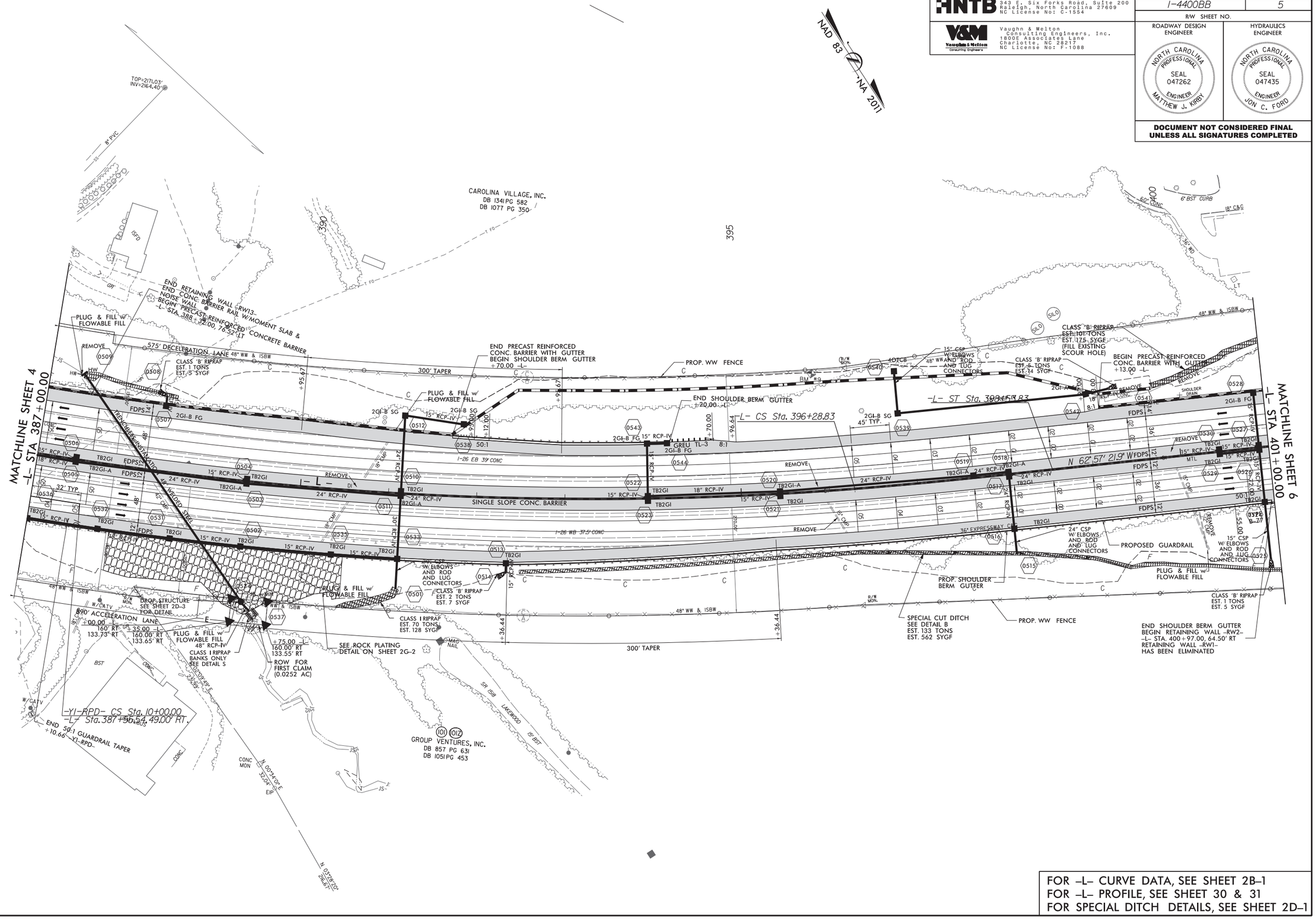

FOR -L- CURVE DATA, SEE SHEET 2B-1
FOR -L- PROFILE, SEE SHEET 30 & 31
FOR SPECIAL DITCH DETAILS, SEE SHEET 2D-1

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NC License No: F-1088

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	6
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047262 ENGINEER MATTHEW J. KIRBY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047435 ENGINEER JON C. FORD

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REVISIONS

NAD 83 NA 2011

CAROLINA VILLAGE, INC.
DB 1341 PG 582
DB 1077 PG 350

CAROLINA VILLAGE RETIREMENT

3SF ROCK

SR 1634 CAROLINA VILLAGE RD

-L- TS Sta. 402+00.93

-L- SC Sta. 404+25.93

SEE ROCK PLATING DETAIL ON SHEET 2G-2

CULVERT CHANNEL IMPROVEMENTS WITH FLOODPLAIN BENCH SEE DETAIL AB CLASS I RIP RAP EST. 73 TONS EST. 16 SYGF

REMOVE EXIST. HW

END PRECAST REINFORCED CONC. BARRIER WITH GUTTER BEGIN SHOULDER BERM GUTTER +23.00 -L-

END SHOULDER BERM GUTTER +73.00 -L-

BEGIN PRECAST REINFORCED CONC. BARRIER WITH GUTTER +28.00 -L-

GRADE TO DRAIN

SINGLE SLOPE CONC. BARRIER

REMOVE

PROP. WW FENCE

15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

10' STONE WALL

60" BLK. WALL

4OTCB

SEE DETAIL O

PLUG & FILL w/ FLOWABLE FILL

END SHOULDER BERM GUTTER +73.00 -L-

BEGIN RETAINING WALL -RW4A- -L- STA. 408+73.00, 64.50' RT
RETAINING WALL -RW3- HAS BEEN ELIMINATED

PROP. RETAINING WALL -RW4A-

CONCRETE BARRIER RAIL W/MOMENT SLAB +09.93 45' TYP.

BEGIN SHOULDER BERM GUTTER END RETAINING WALL -RW2- -L- STA. 403+13.00, 64.50' RT

CLASS 'B' RIPRAP EST. 66 TONS EST. 277 SYGF

CULVERT CHANNEL IMPROVEMENTS WITH FLOODPLAIN BENCH SEE DETAIL AA CLASS I RIP RAP EST. 73 TONS EST. 40 SYGF

+50.00 -L- 172.03' RT 195.00' RT

+75.00 -L- 195.04' RT 210.00' RT

PDE FOR FIRST CLAIM (0.0285 AC)

+10.00 -L- 175.84' RT 195.00' RT

+10.00 -L- 195.00' RT 210.00' RT

BANK STABILIZATION CLASS I RIP RAP EST. 6 TONS EST. 25 SYGF

(101) (102) GROUP VENTURES, INC.
DB 857 PG 631
DB 1051 PG 453

MATCHLINE SHEET 5 -L- STA 401+00.00

MATCHLINE SHEET 7 -L- STA 415+00.00

N 62° 57' 21.9" W

FOR -L- CURVE DATA, SEE SHEET 2B-1
FOR -L- PROFILE, SEE SHEET 31 & 32
FOR SPECIAL DITCH DETAILS, SEE SHEET 2D-1

06-AUG-2019 09:41
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Raleigh, North Carolina 27609
NC License No: C-1554

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Charlotte, NC 28217
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PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	7
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047262 ENGINEER MATTHEW J. KIRBY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047435 ENGINEER JON C. FORD

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REVISIONS

NAD 83 -NA 2011

CAROLINA VILLAGE, INC.
DB 1341 PG 582
DB 1077 PG 350

CLEAR CREEK INVESTMENT GROUP, LLC
DB 3309 PG 430
SLIDE 1167O

HEATHER G. FERNANDEZ
DB 1498 PG 321

GROUP VENTURES, INC.
DB 857 PG 631
DB 1051 PG 453

MATCHLINE SHEET 6
-L- STA 415+00.00

MATCHLINE SHEET 8
-L- STA 429+00.00

REMOVE GR

72" CHEL

72" CHL

8" GR

12" HDPE

MTL

REMOVE EXIST. DI
PLUG & FILL w/ FLOWABLE FILL

BM #11

24" CMP

15" RCP-IV

FS SEE DETAIL O

PLUG & FILL w/ FLOWABLE FILL

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

15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

END SHOULDER BERM GUTTER
BEGIN BARRIER RAIL
-L- STA. 420+26.23

STA. 421+08.56
102.74' LT
STA. 421+18.97
110.94' LT

STA. 421+08.11
74.62' LT
STA. 421+21.66
74.83' LT

CLASS II RIPRAP (RIPRAP UNDER BRIDGE INCLUDED IN STRUCTURE PLANS)
423+18.11
144.76' LT

END BARRIER RAIL
BEGIN PRECAST REINFORCED CONC. BARRIER WITH GUTTER
-L- STA. 423+23.12

PLUG & FILL w/ FLOWABLE FILL
END PRECAST REINFORCED CONC. BARRIER WITH GUTTER
BEGIN SHOULDER BERM GUTTER
-L- STA. 426+18.26

PLUG & FILL w/ FLOWABLE FILL

CLASS 'B' RIPRAP EST. 36 TONS EST. 81 SYGF

CLASS I RIPRAP EST. 4 TONS EST. 12 SYGF

24" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

SHOULDER DRAIN

2GI-B SG

2GI-B FG

I-26 EB 39' CONC

I-26 WB 38' CONC

45' TYP.

FDPS

SINGLE SLOPE CONC. BARRIER

TB2GI

TB2GI-A

24" RCP-IV 20:1 BARRIER TAPER

TEMP. SHORING

BARRIER RAIL

CONC. BRIDGE

LOW CHORD 2197.87

REMOVE

END RETAINING WALL -RW4A-
END CONCRETE BARRIER
BEGIN RETAINING WALL -RW4B-
BEGIN CONC. BARRIER RAIL W/MOMENT SLAB
-L- STA. 418+48.43, 75.42' RT

STA. 418+55.45
75.77' RT

30" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

STA. 419+51.31
154.66' RT

BANK STABILIZATION
CLASS I RIPRAP
EST 7 TONS
EST 17 SYGF

END CONC. BARRIER RAIL W/MOMENT SLAB
BEGIN BARRIER RAIL
-L- STA. 420+49.40

CLASS II RIPRAP (RIPRAP UNDER BRIDGE INCLUDED IN STRUCTURE PLANS)
+60.00 -L-
188.67' RT
205.00' RT

STA. 420+57.06
111.75' RT

STA. 420+34.05
153.44' RT

+90.00 -L-
188.83' RT
205.00' RT

420+56.89
131.30' RT
EL. 2083±

STA. 420+46.18
161.38' RT

STA. 421+18.80
19.30' RT

30" R

STA. 421+87.22
113.67' RT

CLASS II RIPRAP (RIPRAP UNDER BRIDGE INCLUDED IN STRUCTURE PLANS)

END RETAINING WALL -RW4C-
-L- STA. 420+66.27, 61.10' RT
-RW4C- STA. 10+13.41

END RETAINING WALL -RW4B-
BEGIN RETAINING WALL -RW4C-
-L- STA. 420+65.85, 74.50' RT
-RW4C- STA. 10+00.00

SOIL-CHOKED CLASS II RIPRAP FOR FUTURE GREENWAY (RIPRAP UNDER BRIDGE INCLUDED IN STRUCTURE PLANS)

420+65.4
142.90' RT
EL. 2083±

15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

BANK STABILIZATION
CLASS I RIPRAP
EST 2 TONS
EST 6 SYGF

PROP. RETAINING WALL -RW5A-

STA. 423+27.41
116.83' RT

END BARRIER RAIL
BEGIN CONC. BARRIER RAIL W/MOMENT SLAB
-L- STA. 422+99.22, 74.50 RT

BEGIN RETAINING WALL -RW5A-
-L- STA. 422+93.11, 74.50 RT

END CONC. BARRIER RAIL W/MOMENT SLAB
BEGIN PRECAST REINFORCED CONC. BARRIER WITH GUTTER
END RETAINING WALL -RW5A-
BEGIN RETAINING WALL -RW5B-
-L- STA. 424+14.01, 75.00' RT

PROP. RETAINING WALL -RW5B-

S 45°46'04" W
566.70'

FOR BRIDGE SKETCH, SEE SHEET 2B-3
FOR -L- CURVE DATA, SEE SHEET 2B-1
FOR -L- PROFILE, SEE SHEET 32 & 33
FOR SPECIAL DITCH DETAILS, SEE SHEET 2D-1

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V&M Vaughn & Melton Consulting Engineers	Vaughn & Melton Consulting Engineers, Inc. 1800E Associates Lane Charlotte, NC 28217 NC License No: F-1088

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	8
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 047262 ENGINEER MATTHEW J. KIRBY

HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 047435 ENGINEER JON C. FORD

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REVISIONS

MATCHLINE SHEET 25
–Y2– STA 16+00.00

–Y3– POT Sta. 10+00.00
–Y2– Sta. 16+35.26
–Y3– PC Sta. 10+08.28

–Y2– PT Sta. 17+37.89

–Y3– PT Sta. 12+22.10

TIE TO EXISTING DRIVEWAY

–L– CS Sta. 431+82.40

–L– ST Sta. 434+07.40

–Y3– PC Sta. 13+92.79

END CONSTRUCTION
–Y3– Sta. 14+25.00

NAD 83 (2011)

MATCHLINE SHEET 7
–L– STA 429+00.00

MATCHLINE SHEET 9
–L– STA 443+00.00

MATCHLINE SHEET 26
–Y2– STA 26+00.00

PROP. WW FENCE

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

15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

48" WW & ISBW

CLASS 'B' RIPRAP
EST. 14 SYGF

LATERAL BASE DITCH
SEE DETAIL V

END WW FENCE
+77.00, 85.50' LT –L–

BEGIN RETAINING WALL –RW7–
–L– STA. 437+77.00, 80.50' LT

BM #13

SEE DETAIL N

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

+20.34 –Y2–
95.00' RT

+47.21

+85.81

LATERAL BASE DITCH
SEE DETAIL AG

PLUG & FILL w/ FLOWABLE FILL

BEGIN WW FENCE
+51.00, 85.50' LT –L–

END RETAINING WALL –RW7–
–L– STA. 439+51.00, 80.50' LT

BEGIN BARRIER RAIL
–Y2– STA. 20+44.22

TEMP. SHORING

PROP. SHOULDER BERM GUTTER

SEE DETAIL N

REMOVE

BEGIN BARRIER RAIL
–Y2– STA. 20+20.21

SINGLE SLOPE CONC. BARRIER

N 21° 29' 36.9" W

GREU TL-3

PROP. GUARDRAIL

SEE DETAIL O

BEGIN RETAINING WALL –RW6–
–L– STA. 438+79.00, 80.50' RT

END WW FENCE
+79.00, 85.50' RT –L–

+17.32 –Y2–
125.00' RT

END BARRIER RAIL
–Y2– STA. 22+22.04

LATERAL BASE DITCH
SEE DETAIL T

END SHOULDER BERM GUTTER
2GI-B SG +68.00 –L–

END RETAINING WALL –RW6–
–L– STA. 440+65.00, 80.50' RT

+56.73 –Y2–
100.98' LT

BEGIN WW FENCE
+65.00, 85.50' RT –L–

END BARRIER RAIL
–Y2– STA. 22+46.06

CLASS 'B' RIPRAP
EST. 5 TONS
EST. 5 SYGF
FILL EXISTING SCOUR HOLE

CLASS I RIPRAP
EST. 7 TONS
EST. 17 SYGF

–Y2– PC Sta. 24+70.33

+24.66 –Y2–
102.93' LT

+22.35 –Y2–
105.35' LT

+46.55 –Y2–
115.16' LT

+55.92 –Y2–
101.11' LT

+80.00 –Y2–
100.23' LT

LATERAL 'V' DITCH
SEE DETAIL H

BM #46

BANK STABILIZATION
CLASS B RIP-RAP
EST. 7 TONS
EST. 19 SYGF

WELDED STEEL

TRENCHLESS INSTALLATION

+70.33 –Y2–
125.00' RT

CLASS 'I' RIPRAP
BANKS ONLY
SEE DETAIL S

PLUG & FILL w/ FLOWABLE FILL

POND

HEATHER G. FERNANDEZ
DB 1498 PG 321

CLEAR CREEK INVESTMENT GROUP, LLC
DB 3309 PG 430
SLIDE 11670

HEATHER G. FERNANDEZ
DB 1498 PG 321
DB 884 PG 453

FOR BRIDGE SKETCH, SEE SHEET 2B–3
FOR –Y2– & –Y3– INTERSECTION DETAIL, SEE SHEET 2B–4
FOR –L– CURVE DATA, SEE SHEET 2B–1
FOR –L– PROFILE, SEE SHEET 33 & 34
FOR –Y2– & –Y3– CURVE DATA, SEE SHEET 2B–2
FOR –Y2– PROFILE, SEE SHEET 53
FOR –Y3– PROFILE, SEE SHEET 54
FOR SPECIAL DITCH DETAILS, SEE SHEET 2D–1

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V&M Vaughn & Melton Consulting Engineers	Vaughn & Melton Consulting Engineers, Inc. 1800E Associates Lane Charlotte, NC 28217 NC License No: F-1088

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	9
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047262 ENGINEER MATTHEW J. KIRBY

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047435 ENGINEER JON C. FORD

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REVISIONS

NAD 83 NA 2011

MATCHLINE SHEET 8 –L– STA 443+00.00

MATCHLINE SHEET 10 –L– STA 457+00.00

HEATHER G. FERNANDEZ
DB 1498 PG 321
DB 884 PG 453

JOSEPH B. GARREN
DB 437 PG 295

–L– TS Sta. 456+49.99

+90.00 –L–
179.50' LT
205.00' LT

+15.00 –L–
181.53' LT
205.00' LT

CLASS I RIPRAP
EST 21 TONS
EST 47 SYGF

PLUG & FILL w/ FLOWABLE FILL

CLASS I RIPRAP
EST. 11 TONS
EST. 22 SYGF

SR 1635 HYDER FARM RD 20' BST

PROP. SHOULDER BERM GUTTER

PROP. WW FENCE

PROPOSED GUARDRAIL

CLASS I RIPRAP
EST. 15 TONS
EST. 30 SYGF

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

SEE ROCK PLATING DETAIL ON SHEET 2G-2

PLUG & FILL w/ FLOWABLE FILL
HYDER FARM RD 19' BST

REMOVE

15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

18" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

BEGIN SHOULDER BERM GUTTER +00.00 –L–

PLUG & FILL w/ FLOWABLE FILL

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

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

WILLIAM L. HARPER, JR.
DB 788 PG 147

GREGORIO M. AGUILLON
DB 775 PG 579

TCB PROPERTIES, LLC
DB 1647 PG 545

GLENN M. DUDAS
DB 1313 PG 232
DB 1082 PG 470

ROBERT H. STEPHENS, JR.
DB 1554 PG 569

N 21° 29' 36.9" W – L –

15" RCP–IV SINGLE SLOPE CONC. BARRIER

I-26 EB 37.5' CONC

I-26 WB 37.5' CONC

36" EXPRESSWAY CSG

GPS-31

BM #14

BM #15

S 85°29'15" E 107.14'

N 74°09'08" E 246.48'

S 83°44'09" E 459.08'

N 84°51'17" W 405.46'

FOR –L– CURVE DATA, SEE SHEET 2B–1
FOR –L– PROFILE, SEE SHEET 34 & 35
FOR SPECIAL DITCH DETAILS, SEE SHEET 2D–1

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Charlotte, NC 28217
NC License No: F-1088

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	10
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047262 ENGINEER MATTHEW J. KIRBY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047435 ENGINEER JON C. FORD

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REVISIONS

NAD 83 NA 2011

MATCHLINE SHEET 9
-L- STA 457+00.00

MATCHLINE SHEET 11
-L- STA 471+00.00

-L- SC Sta. 458+74.99

-L- CS Sta. 468+29.77

-L- ST Sta. 470+54.77

JOSEPH B. GARREN
DB 437 PG 295

WESLEY A. FREEMAN
DB 1474 PG 641

CATHY SIMPSON
DB 1689 PG 635

BEVERLY L. KILLOUGH, ET AL
DB 3144 PG 703

FOY F. GARREN
DB 1647 PG 16

ALEXONE DR

SR 1635 HYDER FARM RD

N 04°55'52" E 264.62'

N 85°12'43" W 234.16'

N 85°57'23" W 288.12'

S 02°52'05" W 220.97'

S 04°55'52" W 124.50'

S 84°48'08" E 240.48'

SEE ROCK PLATING DETAIL ON SHEET 2G-2

BEGIN EXPRESSWAY GUTTER +36.00 -L-

END SHOULDER BERM GUTTER BEGIN 20' GUTTER TRANSITION +16.00 -L-

BEGIN SHOULDER BERM GUTTER +45.00 -L-

END EXPRESSWAY GUTTER BEGIN 20' GUTTER TRANSITION +25.00 -L-

END SHOULDER BERM GUTTER +40.00 -L-

PROPOSED GUARDRAIL

PROP. WW FENCE

SINGLE SLOPE CONC. BARRIER

PLUG & FILL W/ FLOWABLE FILL

SPECIAL CUT BASE DITCH SEE DETAIL C

SEE DETAIL N

REMOVE

45' TYP.

N 39° 11' 20.3" W

BM #16

FOR -L- CURVE DATA, SEE SHEET 2B-1
FOR -L- PROFILE, SEE SHEET 35 & 36
FOR SPECIAL DITCH DETAILS, SEE SHEET 2D-1

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PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	11

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047262 ENGINEER MATTHEW J. KIRBY

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047435 ENGINEER JON C. FORD

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REVISIONS

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MATCHLINE SHEET 10 –L– STA 471+00.00

MATCHLINE SHEET 12 –L– STA 485+00.00

BEVERLY L. KILLOUGH, ET AL DB 3144 PG 703

HYDER FARM RD.

CLASS 'I' RIPRAP EST. 22 TONS EST. 34 SYGF

END SHOULDER BERM GUTTER +15.00 –L–

PROP. WW FENCE

PLUG & FILL w/ FLOWABLE FILL

COIR FIBER LINER EST. 909 SYGF

PROPOSED GUARDRAIL

GREU TL-3

SINGLE SLOPE CONC. BARRIER

N 39° 11' 20.3" W

END SHOULDER BERM GUTTER +25.00 –L–

COIR FIBER LINER EST. 334 SYGF

BEGIN SHOULDER BERM GUTTER +90.00 –L–

BEGIN SHOULDER BERM GUTTER +50.00 –L–

SPECIAL CUT BASE DITCH SEE DETAIL C

FOR –L– CURVE DATA, SEE SHEET 2B-1
FOR –L– PROFILE, SEE SHEET 36 & 37
FOR SPECIAL DITCH DETAILS, SEE SHEET 2D-1

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PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	12
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047262 ENGINEER MATTHEW J. KIRBY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047435 ENGINEER JON C. FORD

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REVISIONS

MATCHLINE SHEET 11
–L– STA 485+00.00

MATCHLINE SHEET 13
–L– STA 499+00.00

NAD 83 NA 2011

490

495

BEVERLY L. KILLOUGH, ET AL
DB 3144 PG 703

HRR PROPERTIES, LLC
DB 1599 PG 652

G. RAY FUSSELL
DB 1254 PG 107

RICHARD F. MIHALIK
DB 761PG 243

MITCHELL G. BULLINGTON
DB 1500 PG 371

TOE PROTECTION SEE DETAIL E
EST. 54 TONS
EST. 217 SYGF

PLUG & FILL w/ FLOWABLE FILL

PROP. WW FENCE

BEGIN SHOULDER BERM GUTTER +48.00 –L–

PROPOSED GUARDRAIL

CLASS 'B' RIPRAP
EST. 81 TONS
EST. 142 SYGF

18" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

PROP. SHOULDER BERM GUTTER

TOE PROTECTION SEE DETAIL E

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

RETAIN 48" CMP

PSH

15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

REMOVE

12" CMP

7' X 7' SINGLE BARREL CONCRETE BOX CULVERT

SINGLE SLOPE CONC. BARRIER

I-26 EB 38.5' CONC

I-26 WB 36' CONC

N 39° 11' 20.3" W

24" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

STANDARD BASE DITCH SEE DETAIL Y
EST. 15 CY DDE

CLASS 'I' RIPRAP
EST. 7 TONS
EST. 15 SYGF

CLASS 'I' RIPRAP
EST. 7 TONS
EST. 17 SYGF

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

15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

CONC. MON. W/ DISK

PLUG & FILL w/ FLOWABLE FILL

STA. 492+25.00
134.03' RT

END WW FENCE
+15.20, 116.44' RT

STA. 494+68.21
134.08' RT

BEGIN WW FENCE
+26.56, 116.41' RT

48" WW & ISBW

48" WW & 25BW

S 84°00'08" E
415.00'

N 08°31'46" E
488.96'

N 39°49'19" E
455.10'

+45.00 –L–
133.87' RT
145.00' RT

+75.00 –L–
133.87' RT
145.00' RT

FOR –L– CURVE DATA, SEE SHEET 2B–1
FOR –L– PROFILE, SEE SHEET 37 & 38
FOR SPECIAL DITCH DETAILS, SEE SHEET 2D–1

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PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	13
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047262 ENGINEER MATTHEW J. KIRBY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047435 ENGINEER JON C. FORD

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REVISIONS

NAD 83 / NA 2011

500 505 510

MUD CREEK

104 047 HRR PROPERTIES, LLC DB 1599 PG 652

MATCHLINE SHEET 12 –L– STA 499+00.00

MATCHLINE SHEET 14 –L– STA 513+00.00

CLASS I RIPRAP EST. 15 TONS EST. 30 SYGF
PLUG & FILL w/ FLOWABLE FILL
CLASS 'B' RIPRAP EST. 2 TONS EST. 7 SYGF
30" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS
CLASS I RIPRAP EST. 11 TONS EST. 22 SYGF
STANDARD BASE GRASSED SWALE SEE DETAIL X1
15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS
PROP. WW FENCE
PROPOSED GUARDRAIL
PROP. SHOULDER BERM GUTTER
REMOVE
SOIL
F
A
1301 1302 1303 1304 1305 1306 1307 1308 1309 1310 1311 1312 1313 1314 1315 1316 1317 1318 1319 1320 1321 1322 1323 1324 1325 1326 1327 1330 1331

2GI–8 FG
12' FDPS
36'
20'
I–26 EB 36' CONC
I–26 EB 35.5' CONC
I–26 WB 38' CONC
– L –
N 39°11' 20.3" W
GPS–30
GPS–29
SINGLE SLOPE CONC. BARRIER
TB2GI
TB2GI–A
DI30" RCP–IV
15" RCP–IV
30" RCP–IV
24" CMP
15" CMP
30" CMP
20" CMP
12" CMP
36" WELDED STEEL PIPE TRENCHLESS INSTALLATION
24" CMP + 10.00 +28.64
30" RCP–IV +35.86 +62.50
REMOVE
DI
FS 8:1
50:1
TYPE2GI–B
GREU TL–3
RETAIN 30" CMP 26F–A SG
SEE DETAIL N
CAT–1
HW
15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS
CLASS 'B' RIPRAP EST. 2 TONS EST. 7 SYGF
PLUG & FILL w/ FLOWABLE FILL
PROPOSED GUARDRAIL
END SHOULDER BERM GUTTER +00.00 –L–
END SHOULDER BERM GUTTER BEGIN PRECAST REINFORCED CONC. BARRIER WITH GUTTER +2.00 –L–
BEGIN SHOULDER BERM GUTTER +12.50 –L–
SPECIAL CUT BASE DITCH SEE DETAIL G
SPECIAL CUT BASE DITCH SEE DETAIL I
LATERAL 'V' DITCH SEE DETAIL AR
LATERAL BASE DITCH SEE DETAIL F EST. 42 TONS EST. 199 SYGF
BM =20
R/W MON
EIP
DK
ISFD
48" WW & ISBW
MTL
CONCRETE SLOPE PAVED DITCH

SANDRA S. MOOD DB 1668 PG 205
BOBBY JOE LAY DB 883 PG 495
JAMES R. BENNETT DB 1321PG 191
M.C. VENTURES, INC. DB 1492 PG 476
ROBERT J. BRACKEN DB 1453 PG 397
JOSH BOONE DB 1594 PG 50
HARRY M. WILSON, III DB 1149 PG 98
M.C. VENTURES, INC. DB 1076 PG 75
CHARLES E. LENTZ DB 1548 PG 516

N 42°25'17" E 400.53'
N 42°34'05" E 386.43'
N 43°50'05" E 381.48'
S 72°28'09" E 149.65'
N 67°04'58" E 80.55'
N 81°04'44" E 154.68'
N 12°44'43" E 217.10'
N 35°08'36" E 359.55'
N 41°01'50" E 263.69'
N 52°56'37" E 235.06'
N 15°31'09" E 351.79'
N 11°00'39" E 314.92'

FOR –L– CURVE DATA, SEE SHEET 2B–1
FOR –L– PROFILE, SEE SHEET 38 & 39
FOR SPECIAL DITCH DETAILS, SEE SHEET 2D–1

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Raleigh, North Carolina 27609
NC License No: C-1554

Vaughn & Melton Consulting Engineers, Inc.
1800E Associates Lane
Charlotte, NC 28217
NC License No: F-1088

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	14
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047262 ENGINEER MATTHEW J. KIRBY

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047435 ENGINEER JON C. FORD

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REVISIONS

NAD 83 / NA 2011

MATCHLINE SHEET 13 –L– STA 513+00.00

MATCHLINE SHEET 15 –L– STA 527+00.00

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

PLUG & FILL w/ FLOWABLE FILL

STANDARD BASE GRASSED SWALE SEE DETAIL X2

18" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

PROP. WW FENCE

PROPOSED GUARDRAIL

END SHOULDER BERM GUTTER +10.50 –L–

CLASS I RIPRAP EST. 11 TONS EST. 22 SYGF

30" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

PLUG & FILL w/ FLOWABLE FILL

CLASS I RIPRAP EST. 7 TONS EST. 17 SYGF

BANK STABILIZATION CLASS B RIP RAP EST. 7 TONS EST. 19 SYGF

STANDARD BASE GRASSED SWALE SEE DETAIL Z

30" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

PLUG & FILL w/ FLOWABLE FILL

BEGIN SHOULDER BERM GUTTER +75.00 –L–

BEGIN WW FENCE +30.11, 90.38' LT –L– +25.00 –L– 135.19' LT

END WW FENCE +96.16, 89.31' LT –L– 160.00' LT

PROPOSED GUARDRAIL

CLASS B RIPRAP EST. 2 TONS EST. 7 SYGF

CLASS II RIPRAP EST. 8 T

+65.00 –L– 135.16' LT 160.00' LT

18" CMP RETAIN

FEATHERSTONE CREEK

04 047 HRR PROPERTIES, LLC DB 1599 PG 652

119 JOSUE SOLANO DB 1374 PG 98

HELGE GRESSER DB 1650 PG 550

CAROLINA CONFERENCE ASSOCIATION OF SEVENTH-DAY ADVENTISTS, INC. DB 1019 PG 104

ROY J. ROBINSON DB 957 PG 214

27 CALVIN H. McMINN DB 553 PG 707

28 BLANCA CONTRERAS DB 3270 PG 695

I-26 WB 38.5' CONC

I-26 EB 37.5' CONC

SR 1680 WENDY LN BST

N 39° 11' 20.3" W

SINGLE SLOPE CONC. BARRIER

6' BK WALL

60' CONC

8' X 8' TRIPLE BARREL CONCRETE BOX CULVERT

RETAIN

END PRECAST REINFORCED CONC. BARRIER WITH GUTTER +43.00 –L–

BEGIN SHOULDER BERM GUTTER +61.00 –L–

END SHOULDER BERM GUTTER BEGIN PRECAST REINFORCED CONC. BARRIER WITH GUTTER +58.00 –L–

END WW FENCE +64.64, 91.55' RT –L–

BEGIN WW FENCE +01.91, 90.22' RT –L–

CLASS II RIPRAP EST. 7 TONS

STA. 526+27.34 134.83' RT

STA. 525+42.42 134.81' RT

+65.00 –L– 134.82' RT 160.00' RT

+01.04 –L– 160.00' RT

+05.00 –L– 134.83' RT 160.00' RT

+40.00 –L– 134.57' RT 145.00' RT

+10.00 –L– 134.59' RT 145.00' RT

24" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

BERM DITCH SEE DETAIL J

PROP. WW FENCE

BERM DITCH SEE DETAIL J

BDO

48" WW

GREU TL-3

SEE DETAIL N

TYPE B-77

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

BM #22

BM #21

FOR –L– CURVE DATA, SEE SHEET 2B–1
FOR –L– PROFILE, SEE SHEET 39 & 40
FOR SPECIAL DITCH DETAILS, SEE SHEET 2D–1

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V&M Vaughn & Melton Consulting Engineers	Vaughn & Melton Consulting Engineers, Inc. 1800E Associates Lane Charlotte, NC 28217 NC License No: F-1088

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	15
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047262 ENGINEER MATTHEW J. KIRBY

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047435 ENGINEER JON C. FORD

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REVISIONS

NAD 83 NA 2011

MATCHLINE SHEET 14 –L– STA 527+00.00

MATCHLINE SHEET 16 –L– STA 539+05.00

–L– TS Sta. 536+46.96

–L– SC Sta. 538+26.96

BEGIN RETAINING WALL –RW8A– –L– STA. 533+52.00, 80.56' LT

END RETAINING WALL –RW8A– BEGIN RETAINING WALL –RW8B– –L– STA. 538+96.00, 80.50' LT

PROPOSED GUARDRAIL

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

LATERAL BASE DITCH SEE DETAIL K1

LATERAL 'V' DITCH – SEE DETAIL K2

CLASS I RIPRAP EST. 11 TONS EST. 22 SYGF

15" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

PLUG & FILL w/ FLOWABLE FILL

PROP. WW FENCE

PROP. SHOULDER BERM GUTTER

30" RCP-IV

48" WW

HRR PROPERTIES, LLC DB 1599 PG 652

ROW FOR FIRST CLAIM (0.8236 AC)

+24.96 –Y5– 90.00' RT

+46.90 –Y5– 90.00' RT

LATERAL BASE DITCH SEE DETAIL L

TOE PROTECTION SEE DETAIL P

REMOVE

45' TYP

2GI-B FG

2GI-A FG

TB2GI

FDPS

15" RCP-IV

24" RCP-IV

18" RCP-IV

18" CMP

REMOVE 12' FDPS 36" EB 38' CONC

I-26 WB 38.5' CONC

SINGLE SLOPE CONC. BARRIER

2GI-B SG

FS SEE DETAIL O

GREU TL-3

BM #23

BEGIN SHOULDER BERM GUTTER +83.00 –L–

END SHOULDER BERM GUTTER +50.00

CLASS B RIPRAP EST. 2 TONS EST. 7 SYGF

24" RCP-IV 2GI-A SG

END PRECAST REINFORCED CONC. BARRIER WITH GUTTER BEGIN SHOULDER BERM GUTTER +79.00 –L–

CLASS B RIPRAP EST. 5 TONS EST. 14 SYGF

4OTCB

48" WW & ISBW

PROP. WW FENCE

CAROLINA CIR.

TABITHA WILLS DB 1418 PG 438

ISBKD

WD RAMP

GRADE TO DRAIN

18" BST

+55.40 –Y5– 245.36' RT

+64.58 –Y5– 230.56' RT

+72.00 –Y5– 256.00' RT

CARMEN H. LONDON DB 1449 PG 450

+81.00 –Y5– 242.00' RT

EDDIE LARRIUZ DB 613 PG 609

CAROLYN J. DAVIS DB 1497 PG 136

S 34°37'59" E 192.50'

S 35°02'41" E 84.21'

S 34°08'14" E 100.26'

N 57°22'34" E 108.49'

FOR –L– CURVE DATA, SEE SHEET 2B–1
FOR –L– PROFILE, SEE SHEET 40 & 41
FOR SPECIAL DITCH DETAILS, SEE SHEET 2D–1

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PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	16
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047262 ENGINEER MATTHEW J. KIRBY

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047435 ENGINEER JON C. FORD

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MATCHLINE SHEET 27
-Y5- STA 14+75.00

MATCHLINE SHEET 15
-L- STA 539+05.00

MATCHLINE SHEET 28
-Y5- STA 24+25.00

MATCHLINE SHEET 17
-L- STA 553+00.00

NAD 83 (NA 2011)

-Y5- PC Sta. 17+24.06

-Y5- PT Sta. 21+27.52

-Y6- PT Sta. 11+62.17

-Y6- PC Sta. 10+93.09

BEGIN CONSTRUCTION
-Y6- POT Sta. 10+00.00

-Y6- PT Sta. 12+23.16
-Y5- Sta. 23+05.83

-WEIGH-B- PCC Sta. 12+58.39
-L- CS Sta. 552+44.84

-WEIGH-B- PC Sta. 10+00.00
-L- Sta. 549+97.50, 49.00 LT.

-WEIGH-C- PC Sta. 10+00.00
-L- Sta. 548+39.95, 49.00 RT.

-WEIGH-C- PT Sta. 11+80.31

-WEIGH-C- PC Sta. 14+02.79

CHAMPIONS GOLF LEARNING CENTER, INC.
DB 1567 PG 714

CLEMENT PAPPAS NC, LLC
DB 28 PG 458

RICHARD LEON LAMB REVOCABLE TRUST
DB 572 PG 521

JAMES E. HANNEN
DB 1082 PG 351

HEASLEY N. HILL
DB 568 PG 451

WINFORD S. WRIGHT
DB 1507 PG 133

ANTHONY D. BAILEY
DB 829 PG 725

NATHAN A. BENSON

JOSHUA WALLACE
DB 3022 PG 82

AARON K. SMITH
DB 1517 PG 368

JAMES R. ANTHONY
DB 1183 PG 108

McARTHUR WALKER, JR.
DB 863 PG 636

MARY N. CONTOMARINOS, ET AL
DB 1188 PG 476

PAULA B. ROBERTS
DB 1509 PG 431

MICHAEL C. HODGES
DB 1619 PG 624

RUSSELL E. GIPE
DB 523 PG 133

DB 564 PG 538

PROPOSED GUARDRAIL

PROP. WW FENCE

920' ACCELERATION LANE

595' DECELERATION LANE

SINGLE SLOPE CONC. BARRIER

END SHOULDER BERM GUTTER BEGIN PRECAST REINFORCED CONC. BARRIER WITH GUTTER

END RETAINING WALL -RW8- L- STA. 540+68.00, 80.50' LT

END BARRIER RAIL -Y5- STA. 20+00.08

BEGIN RETAINING WALL -RW9- -L- STA. 539+30.00, 80.50' RT

STA. 541+71.48, 134.38' RT
END RETAINING WALL -RW9-
-L- STA. 541+29.00, 80.50' RT
END BARRIER RAIL
-Y5- STA. 20+16.36

TOE PROTECTION SEE DETAIL P

LATERAL BASE DITCH SEE DETAIL L

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

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

CLASS 'I' RIPRAP SEE DETAIL AC

STANDARD 'V' DITCH SEE DETAIL D EST. 99 TONS EST. 189 SYGF

PLUG & FILL w/ FLOWABLE FILL

24" CSP W/ BOWS AND PLUG CONNECTORS

48" WW

15" RCP-IV

24" RCP-IV

18" RCP-IV

12' FDPS

TB2GI

2GI-B FG

2GI-B SG

2GI-A SG

GREU TL-3

CAT-1

1-26 EB 45.5' CONC

1-26 EB 38' CONC

1-26 WB 38' CONC

SEE SHEET 2B-3, FOR BRIDGE SKETCH
FOR CAROLINA CIRCLE INTERSECTION DETAIL, SEE SHEET 2B-9
FOR -Y5- & -Y6- INTERSECTION DETAIL, SEE SHEET 2B-6
FOR -L-, -WEIGH-B-, & -WEIGH-C- CURVE DATA, SEE SHEET 2B-1
FOR -Y5- CURVE DATA, SEE SHEET 2B-2
FOR -L- PROFILE, SEE SHEET 41 & 42
FOR -Y5- PROFILE, SEE SHEET 55
FOR -WEIGH-B- PROFILE, SEE SHEET 51
FOR -WEIGH-C- PROFILE, SEE SHEET 50
FOR SPECIAL DITCH DETAILS, SEE SHEET 2D-1

REVISIONS

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PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	17
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047262 ENGINEER MATTHEW J. KIRBY

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047435 ENGINEER JON C. FORD

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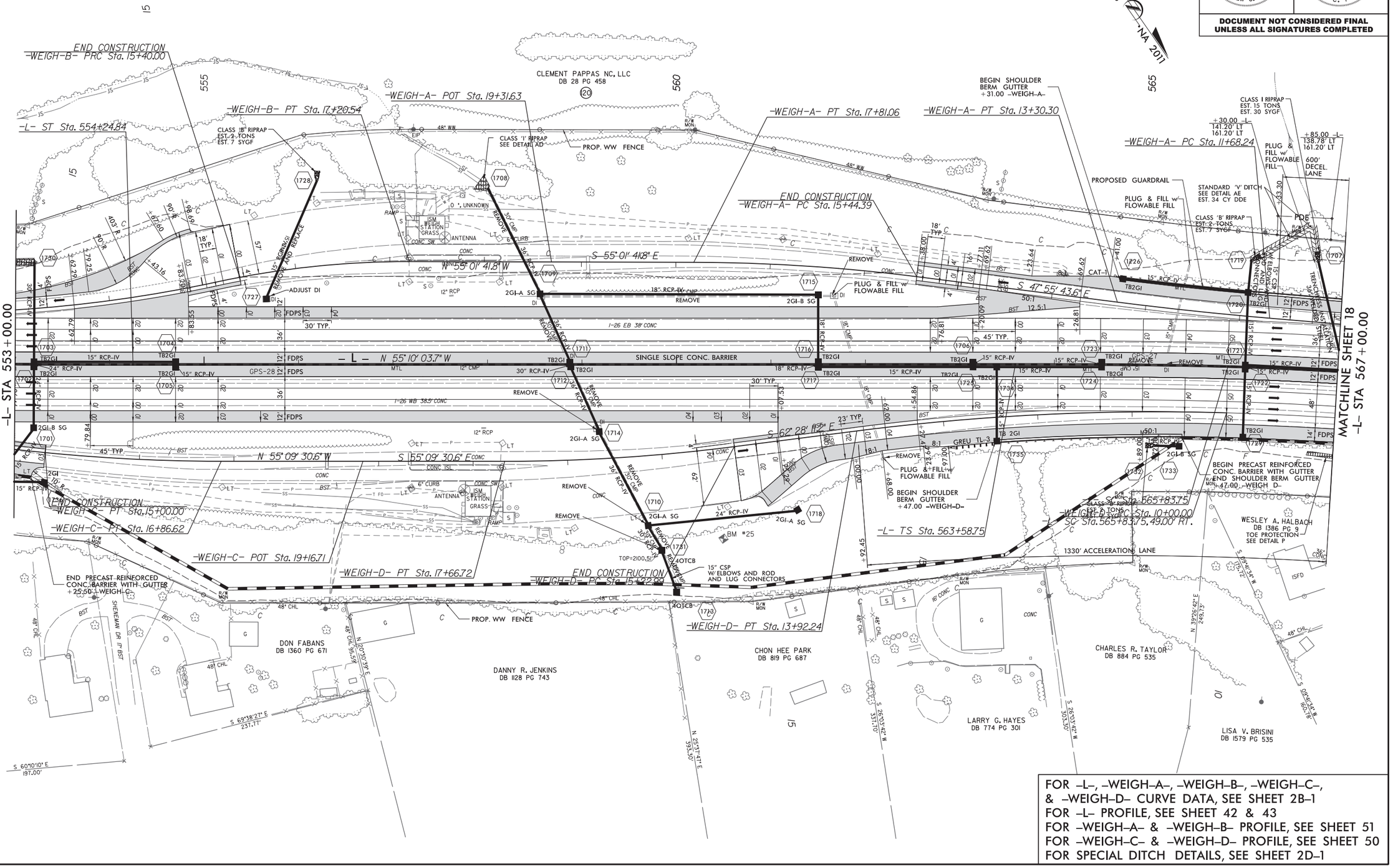
NAD 83 NA 2011

REVISIONS



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Charlotte, NC 28217
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PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	18
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047262 ENGINEER MATTHEW J. KIRBY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047435 ENGINEER JON C. FORD

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570 575 580

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CLEMENT PAPPAS NC, LLC
DB 28 PG 458

YAMONT FARMS, LLC
DB 1537 PG 47

600' DECELERATION LANE

300' EOT TAPER

-WEIGH-A- POT Sta. 10+00.00
-L- Sta. 567+91.81, 49.00' LT.

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

CLASS 'I' RIPRAP
SEE DETAIL AC

+80.00 -L-
135.72' LT
155.00' LT

+00.00 -L-
135.52' LT
155.00' LT

PROP. SHOULDER BERM GUTTER

PLUG & FILL w/ FLOWABLE FILL

PDE

SEE ROCK EMBANKMENT DETAIL ON SHEET 2G-1

15" CSP W/ ELBOWS AND RODS AND PLUG CONNECTORS

PROP. WW FENCE

PROPOSED GUARDRAIL

23' TYP.

SINGLE SLOPE CONC. BARRIER

TRENCHLESS INSTALLATION 66" WELDED STEEL

REMOVE

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

TOE PROTECTION
SEE DETAIL P

END PRECAST REINFORCED CONC. BARRIER WITH GUTTER
BEGIN SHOULDER BERM GUTTER
+40.00 -L-

FS
SEE DETAIL N

JOSHUA S. McGEE
DB 1290 PG 537

COLLEEN BRIGGS
DB 1442 PG 569

1330' ACCELERATION LANE

JAMES McKINNEY
DB 1623 PG 278

CHANNEL CHANGE
SEE DETAIL U
CLASS I RIPRAP
EST. 193 TONS
EST. 337 SYGF

DONALD T. JONES
DB 1289 PG 152

TIMOTHY J. CANNON
DB 1597 PG 465
300' TAPER

ACORN DR

BM #26

MATCHLINE SHEET 17
-L- STA 567+00.00

MATCHLINE SHEET 19
-L- STA 581+00.00

FOR -L- & -WEIGH-A- CURVE DATA, SEE SHEET 2B-1
FOR -L- PROFILE, SEE SHEET 43 & 44
FOR -WEIGH-A- PROFILE, SEE SHEET 51
FOR SPECIAL DITCH DETAILS, SEE SHEET 2D-1

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PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	19
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047262 ENGINEER MATTHEW J. KIRBY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047435 ENGINEER JON C. FORD

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REVISIONS

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MATCHLINE SHEET 18
–L– STA 581+00.00

MATCHLINE SHEET 20
–L– STA 595+00.00

585

590

–L– CS Sta. 586+06.51

–L– ST Sta. 588+31.51

(121) LAYMAN FOUNDATION OF NC, INC.
DB 246 PG 588

+10.00 –L–
133.65' LT
145.00' LT

+90.00 –L–
133.52' LT
145.00' LT

FS
SEE DETAIL O

TOE PROTECTION
SEE DETAIL P

PLUG & FILL w/ FLOWABLE FILL

CHANNEL CHANGE
SEE DETAIL U
CLASS I RIPRAP
EST. 163 TONS
EST. 285 SYGF

PROP. SHOULDER BERM GUTTER

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

BEGIN WW FENCE
+30.83, 93.36' LT –L–

END WW FENCE
+05.58, 93.97' LT –L–

48" WW & ISBW

R/W MON

CLASS II RIPRAP
EST. 8 TONS

REMOVE

24" CSP W/ ELBOWS AND ROD AND TUG CONNECTORS

PLACE RIP-RAP AT EMBANKMENT

48" WW & ISBW
RIP-RAP ON BANKS EMBEDDED IN CHANNEL SEE DETAIL 2

END SHOULDER BERM GUTTER
+80.50 –L–

PROPOSED GUARDRAIL

TB2GI

2GI-B SG

2GI-B FG

2GI-A FG

15" RCP-IV

18" RCP-IV

24" RCP-IV

30" RCP-IV

36" RCP-IV

MTL

FDPS

TB2GI-A

REMOVE

PROP. SHOULDER BERM GUTTER

PLUG & FILL w/ FLOWABLE FILL

FS
SEE DETAIL N

BM #27 ELEV.=2088.77'
–BL– STA. 265+98.00 85' RT.
SPIKE NAIL IN BASE OF 24" POPLAR

END WW FENCE
+03.50, 100.42' RT –L–

STA. 587+83.53
137.20' RT

BEGIN WW FENCE
+33.11, 100.34' RT –L–

STA. 588+58.29
136.97' RT

CLASS II RIPRAP
EST. 5 TONS

45' TYP.

END SHOULDER BERM GUTTER
+37.50 –L–

10' X 4' DOUBLE BARREL CONCRETE BOX CULVERT

RETAIN

CONC

GREU TL-3

SINGLE SLOPE CONC. BARRIER

I-26 EB 38.5' CONC

I-26 WB 38.5' CONC

N 21°27'14.0" W

N 04°22'42" E
594.41'

BYERS CREEK

RUINS

FOR –L– CURVE DATA, SEE SHEET 2B–1
FOR –L– PROFILE, SEE SHEET 44 & 45
FOR SPECIAL DITCH DETAILS, SEE SHEETS 2D–1 AND 2D–2

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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-4400BB	20
PARRISH & PARTNERS	Parrish and Partners of North Carolina, PLLC 11325 N Community House Rd Suite 260 Charlotte, NC 28277 NC License No: P-1212	R/W SHEET NO.	

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047262 ENGINEER MATTHEW J. KIRBY	NORTH CAROLINA PROFESSIONAL SEAL 035700 ENGINEER KEVIN P. HIGGINS

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NAD 83 NA 2011

600

605

N 85°12'15" W 620.00'

S 17°12'15" E 620.00'

(121) LAYMAN FOUNDATION OF NC, INC. DB 246 PG 588

(121) LAYMAN FOUNDATION OF NC, INC. DB 246 PG 588

MATCHLINE SHEET 19 –L– STA 595+00.00

MATCHLINE SHEET 21 –L– STA 609+00.00

–L– TS Sta. 602+55.38

–L– SC Sta. 604+35.38

PROP. WW FENCE

48" WW & ISBW

8" METAL

2GI–B SG

REMOVE

FLOWABLE FILL

18" CMP

30" RCP–IV

15" RCP–IV

24" RCP–IV

18" RCP–IV

TB2GI–A

TB2GI

TB2GI MTL

FDPS

N 21°27'14.0" W

SINGLE SLOPE CONC. BARRIER

I–26 EB 38.5' CONC

I–26 WB 38.5' CONC

GREU TI–3

FS SEE DETAIL 1

45' TYP.

BM #28

BM #29

CL I RIP RAP EST RR 2 TONS EST GT 5 SY

12" FUNNEL DRAIN w/LUG & ROD CONNECTORS

FUNNEL

2GI–B FG

TG2GI

BEGIN SHOULDER BERM GUTTER +00.00 –L–

BEGIN SHOULDER BERM GUTTER +25.00 –L–

CAT–1 8:1

+71.36

90.00'

+65.38

+75.00

+48.36

CL B RIP RAP EST. 2 TONS EST. 7 SY

REMOVE APPROX. 3.5 LF OF CMP SQ. PIPE OUTLETS TO NEW DITCH INVERT

RETAIN

HW

FILL W/FLOWABLE FILL

PROPOSED GUARDRAIL

18" CSP W/ ELBOWS AND ROD AND LUG CONNECTORS

12" CMP

FITNESS STATION

FLETCHER HOSPITAL, INC. DB 668 PG 457

LAYMAN FOUNDATION OF NC, INC. DB 246 PG 588

MTL CAN

SOIL

S 68°29'26" W 906.93'

HYAC UNIT

8" BST

24" BST

HOSPITAL DR

LT

FOR –L– CURVE DATA, SEE SHEET 2B–1
FOR –L– PROFILE, SEE SHEET 45 & 46
FOR SPECIAL DITCH DETAILS, SEE SHEET 2D–2

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PARRISH & PARTNERS	Parrish and Partners of North Carolina, PLLC 11325 N Community House Rd Suite 260 Charlotte, NC 28277 NC License No: P-1212

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	21
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047262 ENGINEER MATTHEW J. KIRBY

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 035700 ENGINEER KEVIN P. HIGGINS

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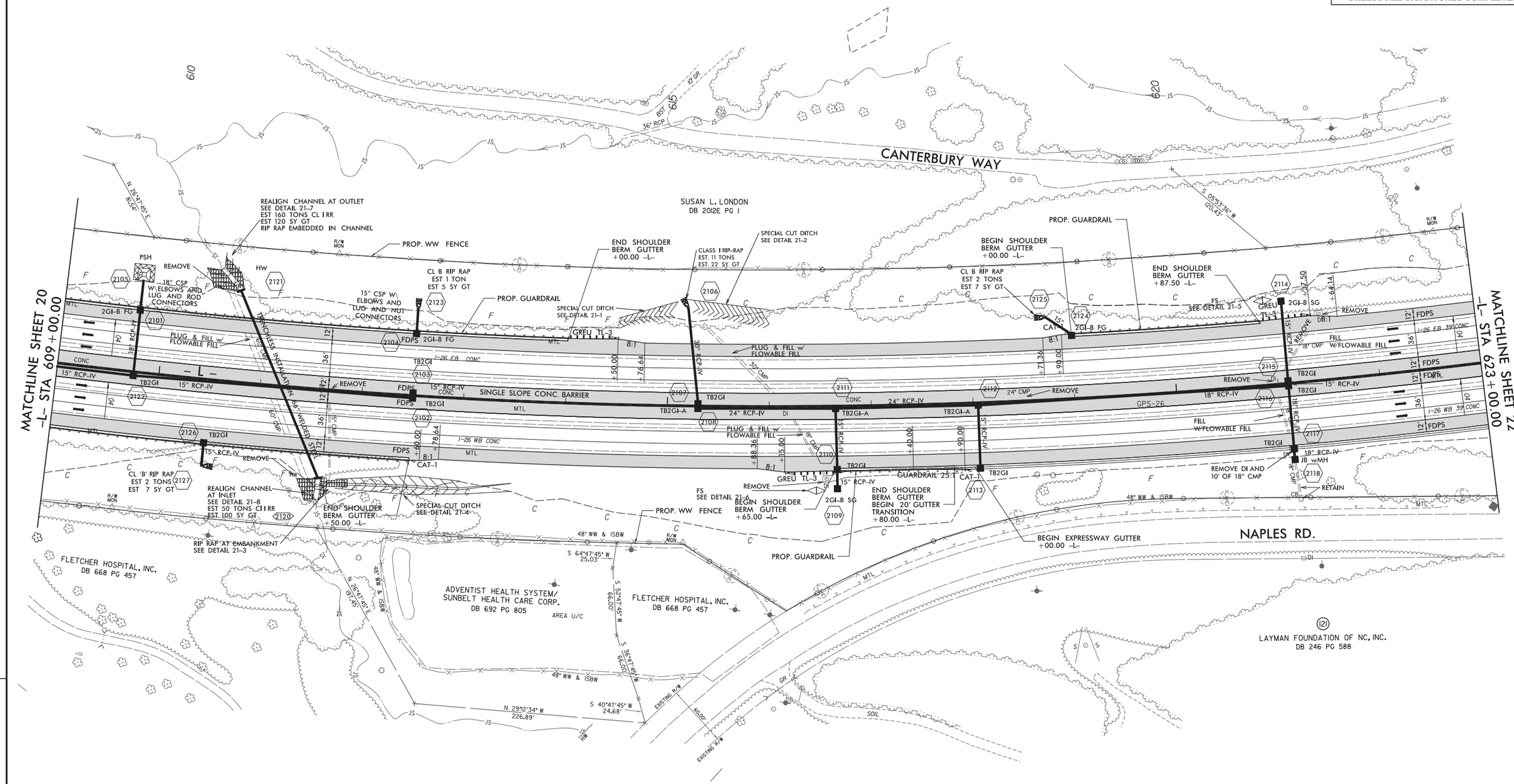
NAD 83 -NA 2011



FOR –L– CURVE DATA, SEE SHEET 2B–1
FOR –L– PROFILE, SEE SHEET 46 & 47
FOR SPECIAL DITCH DETAILS, SEE SHEET 2D–2

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Parrish and Partners of North Carolina, PLLC
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PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	22
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047262 ENGINEER MATTHEW J. KIRBY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 035700 ENGINEER KEVIN P. HIGGINS

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NAD 83 NA 2011

CANTERBURY WAY

MACK C. YOUNBLOOD, JR.
DB 789 PG 431
DB 5511PG 425

BRENDA J. PARSONS, TRUSTEE
DB 1448 PG 370

LEI SHI
DB 1692 PG 251

DB 1007 PG 659

MATCHLINE SHEET 21 –L– STA 623+00.00

MATCHLINE SHEET 23 –L– STA 637+00.00

MATCHLINE SHEET 23 –Y7– STA 20+25.00

BEGIN CONSTRUCTION –Y7– POT Sta. 30+43.09

–Y7– PT Sta. 27+49.41

SR 1534 NAPLES RD

PATTIENGLE
DB 1349 PG 311

DAVIS A. JAMES
DB 1580 PG 406

RYAN YATES
DB 1541PG 172

JOHN W. LINDSEY
DB 1573 PG 647

RODNEY A. SMITH
DB 852 PG 683

LOIS C. CODINGTON
DB 973 PG 637

ROBERT E. HANSEN
DB 562 PG 547

EXECUTIVE INVESTMENTS GENERAL PARTNERSHIP
DB 1325 PG 729

FOR –L– CURVE DATA, SEE SHEET 2B–1
FOR –Y7– CURVE DATA, SEE SHEET 2B–2
FOR –L– PROFILE, SEE SHEET 47 & 48
FOR –Y7– PROFILE, SEE SHEET 57
FOR SPECIAL DITCH DETAILS, SEE SHEET 2D–2

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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

Parrish and Partners of North Carolina, PLLC
11325 N Community House Rd
Suite 260
Charlotte, NC 28277
NC License No: P-1212

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	23
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047262 ENGINEER MATTHEW J. KIRBY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 035700 ENGINEER KEVIN P. HIGGINS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS

MATCHLINE SHEET 24 -Y7- STA 11+70.00

MATCHLINE SHEET 22 -Y7- STA 20+25.00

MATCHLINE SHEET 22 -L- STA 637+00.00

MATCHLINE I-4400C -L- STA 650+50.00

NAD 83 -NA 2011

-Y8- POT Sta. 10+00.00
-Y7- Sta.13+49.31

-Y8- PT Sta. 10+93.16

-Y8-PC Sta. 10+04.71
-Y7-PC Sta. 14+52.03

END CONSTRUCTION
-Y8- POT Sta. 11+52.85

END T.I.P.PROJECT I-4400BB
-L- Sta.650+50.00

-L- ST Sta. 649+87.20

-L- CS Sta. 648+07.20

-Y9- PT Sta. 13+52.93
-Y7- Sta.19+39.60

-Y9- PCC Sta. 10+85.49

END CONSTRUCTION
-Y9- PC Sta. 10+00.00

ASHEVILLE SOUTH SE STORAGE VI, LLC DB 3156 PG 457

MOUNTAIN INN & SUITES-AIRPORT, LLC DB 1451PG 552

SCOTT M. JARVIS DB 1640 PG 309 DB 1282 PG 470 DB 1108 PG 601 DB 1096 PG 566 DB 806 PG 51

DANNY C. HOUSE DB 946 PG 270

NELSON MORALES DB 1457 PG 648

ERNEST O. WRIGHT DB 1526, PG 422

GEORGE M. JARVIS DB 628 PG 333

PHYLIS A. WILSON DB 1391PG 351

JEFFREY HUTCHINSON DB 1646 PG 487

BM #55

BM #2 (I-4400C)

FOR –Y7– & –Y8– INTERSECTION DETAIL, SEE SHEET 2B–7
FOR –Y7– & –Y9– INTERSECTION DETAIL, SEE SHEET 2B–8
FOR –L– CURVE DATA, SEE SHEET 2B–1
FOR –Y7– CURVE DATA, SEE SHEET 2B–2
FOR –L– PROFILE, SEE SHEET 48 & 49
FOR –Y7– PROFILE, SEE SHEET 57
FOR SPECIAL DITCH DETAILS, SEE SHEET 2D–2

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PARRISH & PARTNERS	Parrish and Partners of North Carolina, PLLC 11325 N Community House Rd Suite 260 Charlotte, NC 28277 NC License No: P-1212

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	24
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047262 ENGINEER MATTHEW J. KIRBY

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 035700 ENGINEER KEVIN P. HIGGINS

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REVISIONS

NAD 83 - NA 2011

MATCHLINE SHEET 23
-Y7- STA 11+70.00

-Y7- PT Sta. 11+03.34

BEGIN CONSTRUCTION
-Y7- PC Sta. 10+00.00

SCOTT M. JARVIS
DB 1640 PG 309
DB 896 PG 51

SCOTT M. JARVIS
DB 1640 PG 309
DB 1282 PG 670
DB 1168 PG 566
DB 1096 PG 956
DB 806 PG 51

TERESA JUSTICE
DB 2007E PG 762
DB 492 PG 197

JOHN M. JUSTICE
DB 1280 PG 696

SAMUEL E. JOHNSTON, III
DB 1205 PG 347

ROGER W. LUNSFORD
DB 1580 PG 433

JANA V. DEAVER
DB 3150 PG 592

ASHEVILLE SOUTH SELF STORAGE VI, LLC

MICHAEL A. LEDFORD
DB 934 PG 175

THOMAS BRISTOL, JR.
DB 1525 PG 184

BRAD A. BUTTERFIELD
DB 1558 PG 242

DEENA B. JOHNSTON
DB 1676 PG 221

KEITH MCKINNEY ET AL
DB 1609 PG 311

CARY G. JUSTICE
DB 1603 PG 197

SR 1533 OLD ASHEVILLE RD
SR 1534 NAPLES RD
SR 1534 S NAPLES RD
35' EXPRESSWAY CURB LT
M.T.L. LOADING DOCK
TIE TO EXISTING DITCH
RETAIN
EXISTING R/W
EIP RIPRAP
EIP W/ CAP
EIP
BM #57
ISFD
ISMTLBUS
CONC
BST
M.T.L.
-Y7- 40.00' RT
72' CHL 35BW

FOR –Y7– CURVE DATA, SEE SHEET 2B–2
FOR –Y7– PROFILE, SEE SHEET 57
FOR SPECIAL DITCH DETAILS, SEE SHEET 2D–2

06-AUG-2019 09:47
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V&M Vaughn & Melton Consulting Engineers
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1800E Associates Lane
Charlotte, NC 28217
NC License No: F-1088

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	25
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047262 ENGINEER MATTHEW J. KIRBY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047435 ENGINEER JON C. FORD

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83 NA 2011

-Y2- PC Sta. 13+50.00

END EXPRESSWAY GUTTER
-Y2-, STA. 14+00.00
+28.11 -Y2-
45.00' LT

BEGIN EXPRESSWAY GUTTER
-Y2- STA. 12+40.00
+20.00 -Y2-
30.00' LT

+85.00 -Y2-
30.00' LT

+60.00 -Y2-
45.00' LT
30.00' LT

+40.00 -Y2-
45.00' LT
30.00' LT

9+35.27 -EY12-
30.00' LT

REMOVE

REMOVE HEADWALL

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

SPECIAL CUT DITCH
(SEE DETAIL R

BEGIN CONSTRUCTION
-Y2- POT Sta. 10+00.00

MATCHLINE SHEET 8
-Y2- STA 16+00.00

02A
HEATHER G. FERNANDEZ
DB 1498 PG 321
DB 884 PG 453

02B
CLEAR CREEK INVESTMENT GROUP, LLC
DB 3309 PG 430
SLIDE 11670

CUMBERLAND VILLAGE REGIME
DB 690 PG 772

SR 1508 BALFOUR RD 20' BST
SR 1503 CLEAR CREEK RD 21.5' BST
SR 1503 CLEAR CREEK RD 21' BST

N 15° 18' 00.0" E

+00.00 -Y2-
60.00' RT
30.00' RT

+29.00 -Y2-
60.00' RT

+33.00 -Y2-
85.00' RT

+81.00 -Y2-
60.00' RT

+04.00 -Y2-
60.00' RT

+07.00 -Y2-
72.00' RT

+25.00 -Y2-
60.00' RT

+26.00 -Y2-
66.00' RT

+50.00 -Y2-
60.00' RT

+02.43 -Y2-
60.00' RT

+00.00 -Y2-
41.38' RT

+02.43 -Y2-
48.69' RT

+00.00 -Y2-
95.00' RT

FOR –Y2– & –Y3– CURVE DATA, SEE SHEET 2B–2
FOR –Y2– PROFILE, SEE SHEET 53
FOR –Y3– PROFILE, SEE SHEET 54
FOR SPECIAL DITCH DETAILS, SEE SHEET 2D–1

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

V&M Vaughn & Melton Consulting Engineers
Vaughn & Melton
Consulting Engineers, Inc.
1800E Associates Lane
Charlotte, NC 28217
NC License No: F-1088

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	26
R/W SHEET NO.	

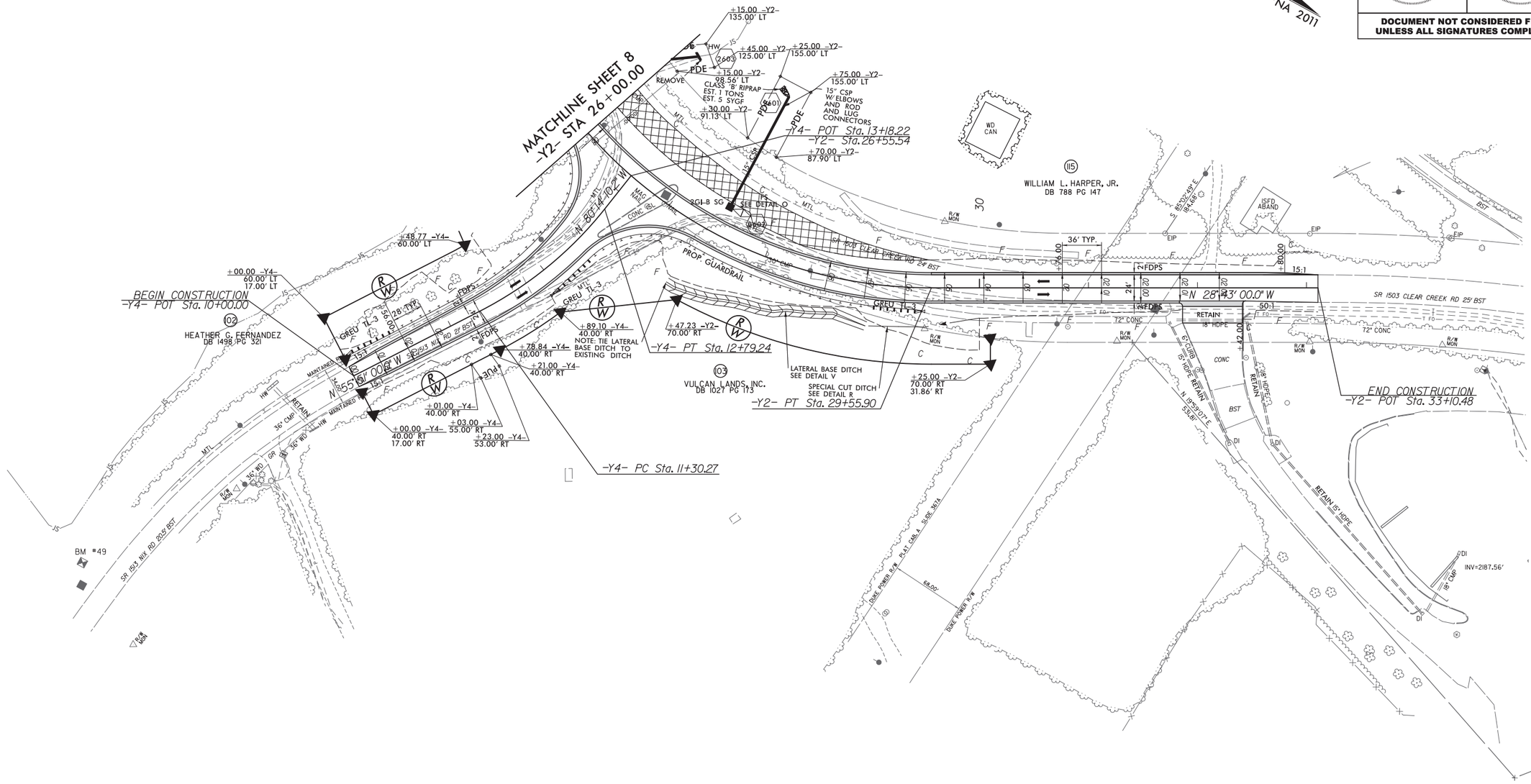
ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047262 ENGINEER MATTHEW J. KIRBY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047435 ENGINEER JON C. FORD

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83 NA 2011

REVISIONS



FOR –Y2– & –Y4– INTERSECTION DETAIL, SEE SHEET 2B–5
FOR –Y2– & –Y4– CURVE DATA, SEE SHEET 2B–2
FOR –Y2– PROFILE, SEE SHEET 53
FOR –Y4– PROFILE, SEE SHEET 54
FOR SPECIAL DITCH DETAILS, SEE SHEET 2D–1

06-AUG-2019 09:48
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Raleigh, North Carolina 27609
NC License No: C-1554

Vaughn & Melton Consulting Engineers, Inc.
1800E Associates Lane
Charlotte, NC 28217
NC License No: F-1088

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	27
R/W SHEET NO.	

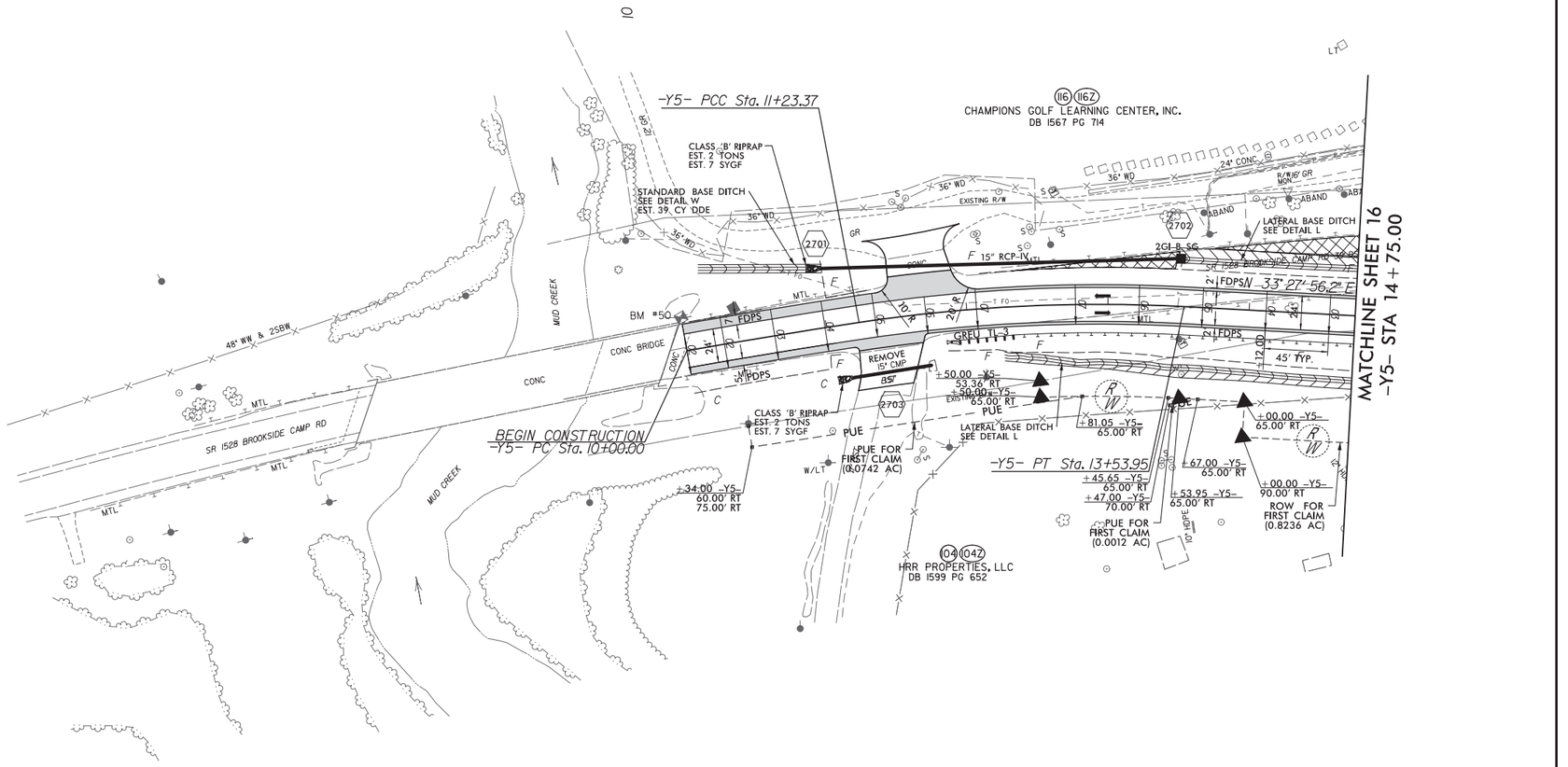
ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047262 ENGINEER MATTHEW J. KIRBY

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047435 ENGINEER JON C. FORD

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83 NA 2011

REVISIONS



FOR –Y5– CURVE DATA, SEE SHEET 2B–2
FOR –Y5– PROFILE, SEE SHEET 55
FOR SPECIAL DITCH DETAILS, SEE SHEET 2D–1

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V&M Vaughn & Melton Consulting Engineers	Vaughn & Melton Consulting Engineers, Inc. 1800E Associates Lane Charlotte, NC 28217 NC License No: F-1088

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	28
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047262 ENGINEER MATTHEW J. KIRBY

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047435 ENGINEER JON C. FORD

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NAD 83 NA 2011

REVISIONS

MATCHLINE SHEET 16
-Y5- STA 24+25.00

-Y5- PC Sta. 26+76.87

-Y5- PT Sta. 30+00.47

-Y5- PC Sta. 31+50.10

END CONSTRUCTION
-Y5- Sta. 31+80.00

-Y5- PT Sta. 32+55.04

ALVARO A. ALARCON
DB 1042 PG 695

ROBERT ROLAND
DB 1685 PG 264
DB 1685 PG 268

FAKIR B. PATEL
DB 1226 PG 135

FAKIR B. PATEL
DB 1154 PG 224

EDWARD W. NUCKOLLS, ET AL
DB 1624 PG 510

JUNE K. STEPP
DB 1638 PG 361

ELLEN S. LAMB
DB 487 PG 451

SOUTHERN BELL TEL. & TEL. CO.
DB 748 PG 439 TIE WALL

YOUNGBLOOD OIL COMPANY, INC.
DB 746 PG 209

SHARON STEPP
DB 1137 PG 741

SHANE C. TAYLOR
DB 1312 PG 453

DAVID M. TAYLOR
DB 1181 PG 601

C & H RENTALS, LLC
DB 1169 PG 396

JAMES E. HANNEN, JR.
DB 883 PG 444

PAMELA L. BARNETT
DB 3039 PG 575

MEZPAH PROPERTIES, LLC
DB 943 PG 537
DB 1143 PG 253

BEGIN EXPRESSWAY GUTTER
+25.00 -Y5-

PLUG & FILL w/ FLOWABLE FILL

DO NOT DISTURB SEPTIC SYSTEM

DO NOT DISTURB UTILITIES

LATERAL BASE DITCH
SEE DETAIL L

SR 1528 BROOKSIDE CAMP RD

SR 1506 HOWARD GAP RD

SR 1645 CAROLINA CIR OF BST

FOR –Y5– CURVE DATA, SEE SHEET 2B–2
FOR –Y5– PROFILE, SEE SHEET 55
FOR SPECIAL DITCH DETAILS, SEE SHEET 2D–1

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

Vaughn & Melton
Consulting Engineers, Inc.
1800E Associates Lane
Charlotte, NC 28217
NC License No: F-1088

PROJECT REFERENCE NO.	SHEET NO.
I-4400BB	32
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047262 ENGINEER MATTHEW D. KELLY

Docusigned by: DAFC29687A894F8... 7/11/2019

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047435 ENGINEER CHRISTOPHER M. FORD

Docusigned by: 42B0F2E27A0C43D... 7/12/2019

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REVISIONS

–L– EB

–L–

BEGIN BRIDGE OVER CLEAR CREEK –L– STA 420+54.38

END BRIDGE OVER CLEAR CREEK –L– STA 422+92.12

(–)0.8344%

CLEAR CREEK

BM11
ELEV. = 2130.37
N 599488 E 970938
–L– STA. 416+30.52, 113.61' LT
SPIKE NAIL IN BASE OF 22" RED OAK

FOR –L– PLAN, SEE SHEETS 6 & 7

2,160′ 2,150′ 2,140′ 2,130′ 2,120′ 2,110′ 2,100′ 2,090′ 2,080′

411+00 412+00 413+00 414+00 415+00 416+00 417+00 418+00 419+00 420+00 421+00 422+00 423+00 424+00 425+00

–L– WB

–L–

BEGIN BRIDGE OVER CLEAR CREEK –L– STA 420+54.38

END BRIDGE OVER CLEAR CREEK –L– STA 422+92.12

(–)0.8659%

CLEAR CREEK

FOR –L– PLAN, SEE SHEETS 6 & 7

2,150′ 2,140′ 2,130′ 2,120′ 2,110′ 2,100′ 2,090′ 2,080′ 2,070′

411+00 412+00 413+00 414+00 415+00 416+00 417+00 418+00 419+00 420+00 421+00 422+00 423+00 424+00 425+00

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HNTB

12-JUL-2019 12:54

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	I-4400BB	X-115

495+00.00

2099.37 2100.19 2099.19 2099.33 2100.33 2099.51

2098.07

1.75:1 2:1 3.34:1

EX. ROW

494+50.00

2100.86 2101.67 2100.68 2100.83 2101.83 2101.02

2099.09

2:1 2.70:1

–L– (I–26)

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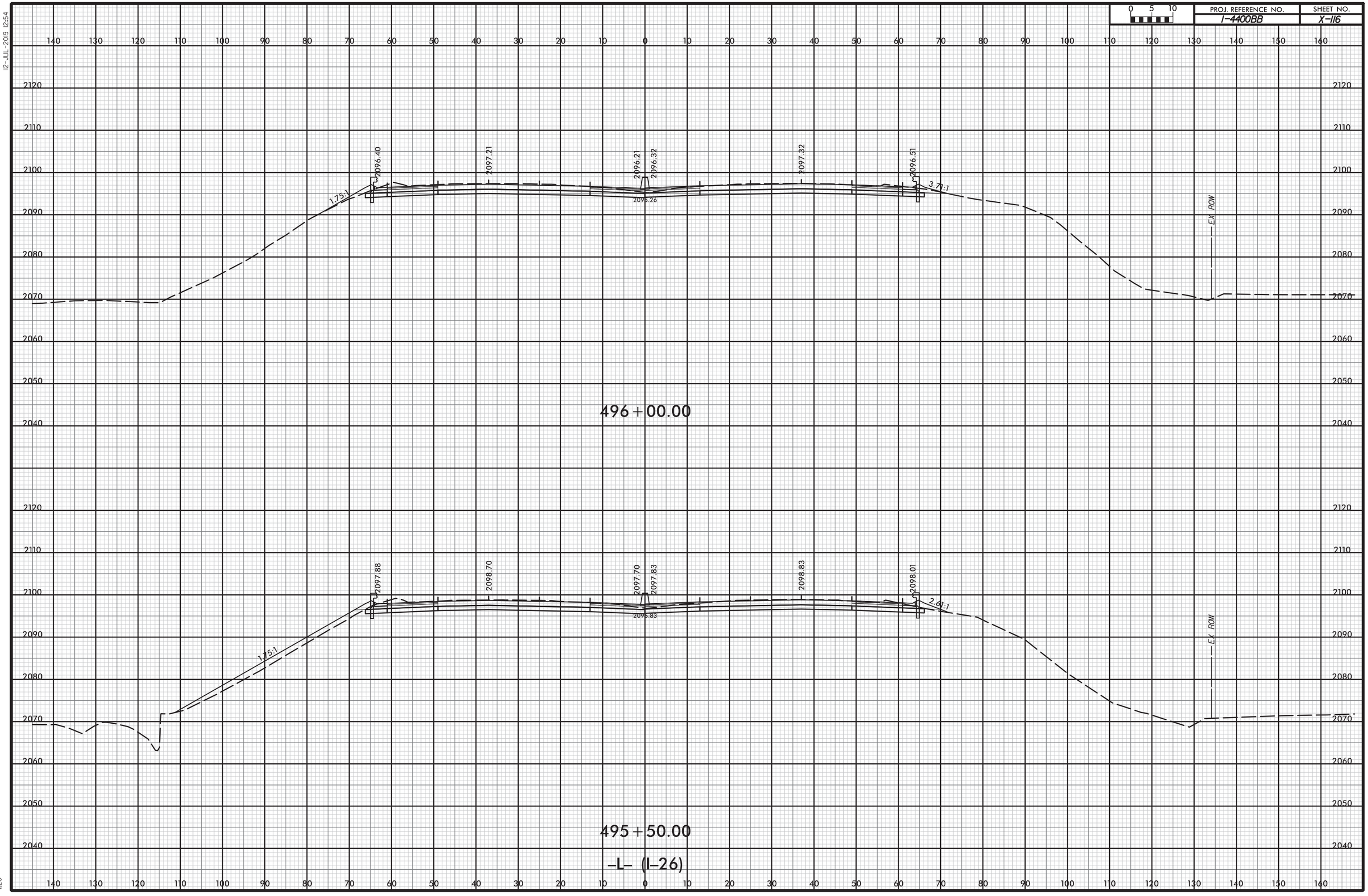

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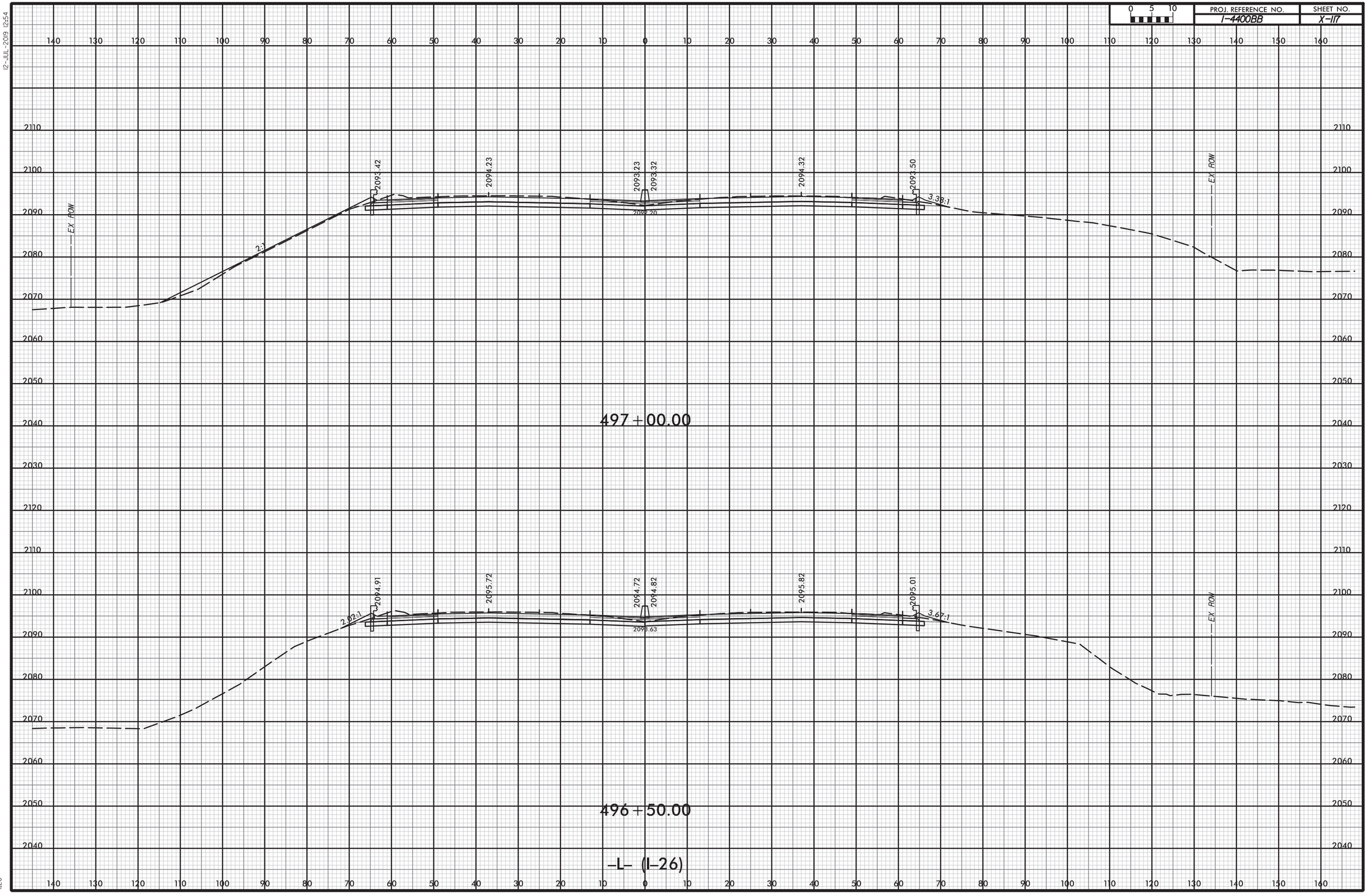
	I-4400BB	X-117



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I-20

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1:20

PROJ. REFERENCE NO.	SHEET NO.
I-4400BB	X-127

0 5 10

EX. ROW

2:1

2081.37 2082.18 2081.18 2081.18 2082.18 2081.37 2079.61

1.5:1

2085.66

507+00.00

EX. ROW

2:1

2081.65 2082.47 2081.46 2081.47 2082.47 2081.65 2079.84

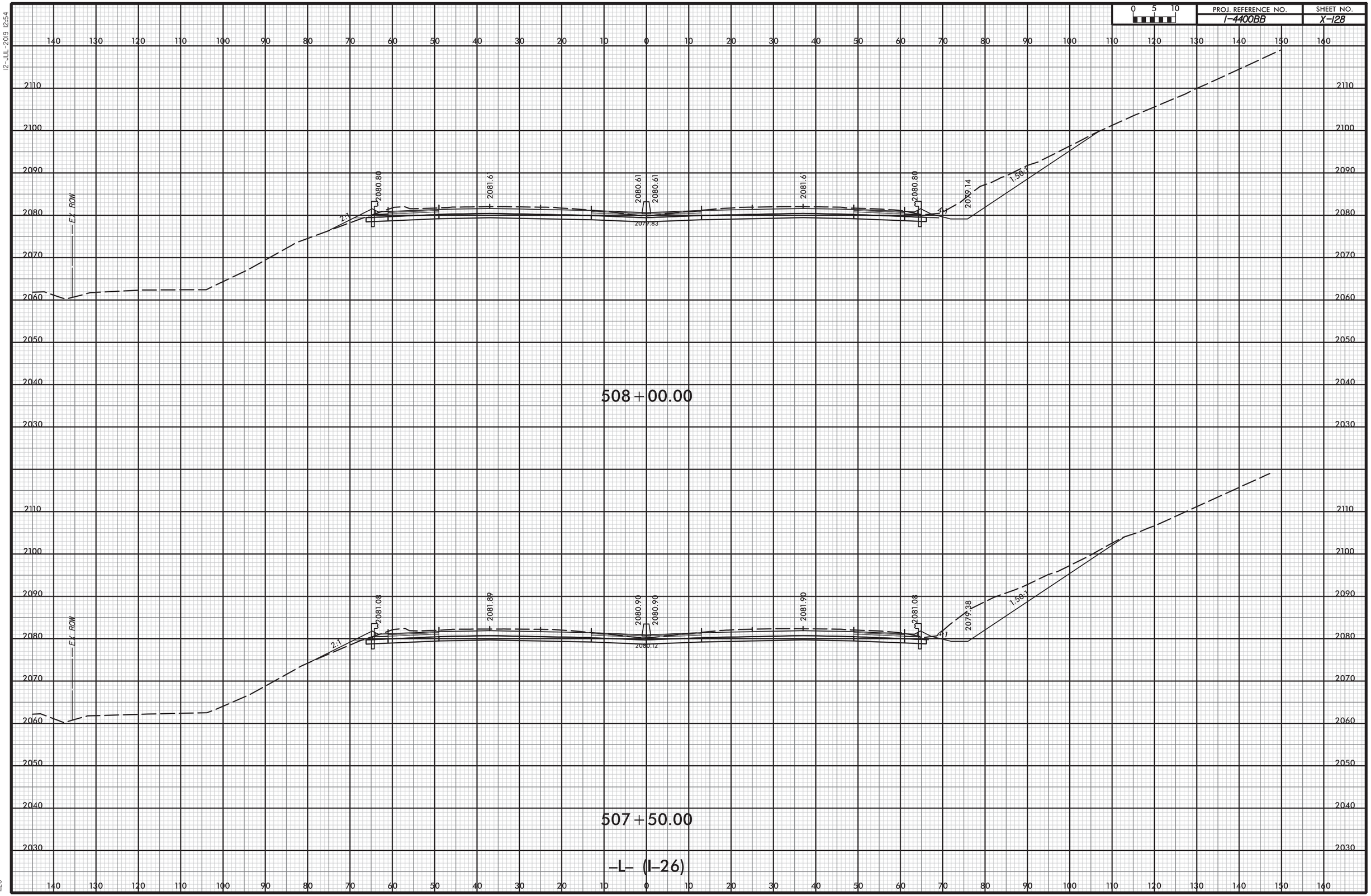
1.5:1

2085.66

506+50.00

–L– (I–26)

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	I-4400BB	X-128



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HNTB
1:20

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	I-4400BB	X-193

573+00.00

EX. ROW
1.75:1
2107.09
2106.19
2104.34
2105.00
2103.93
2102.16
2:1
EX. ROW

572+50.00

EX. ROW
1.75:1
2107.90
2106.90
2105.05
2105.63
2104.56
2102.60
2:1
EX. ROW

–L– (I–26)

12-JUL-2019 12:56
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I:20

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7/24/2017

TIP PROJECT: I-4400C

CONTRACT: C204265

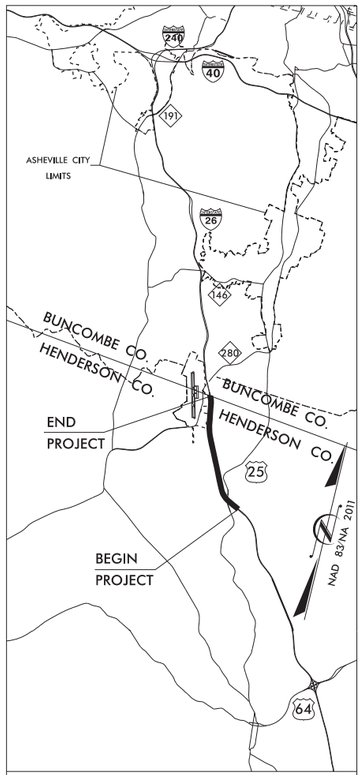
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BUNCOMBE & HENDERSON COUNTIES

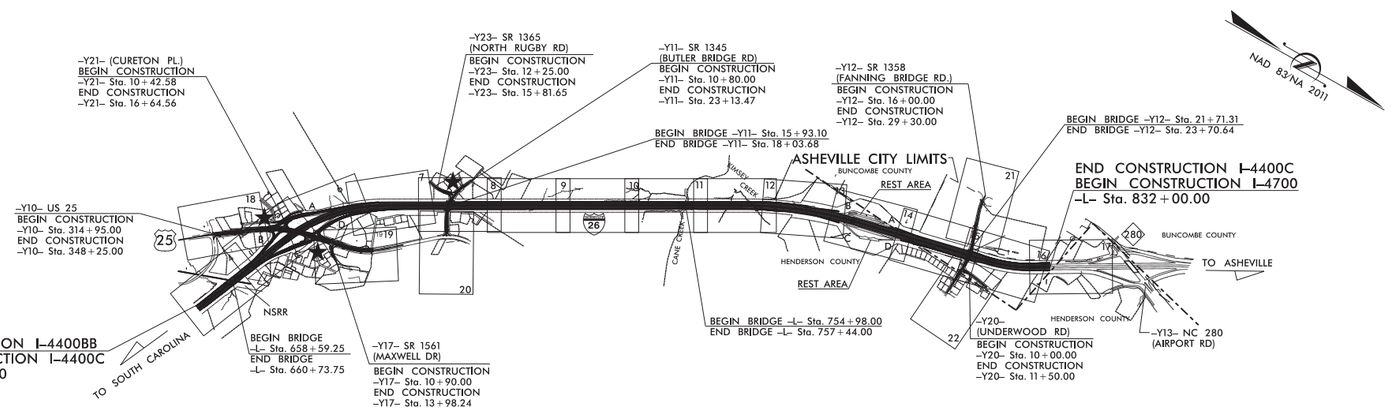
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	I-4400C	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
34232.1.FS4	NHPP-026-1(200)13	I-4400C (P.E.)
34232.2.5	N/A	I-4400C (R/W)
34232.2.7	N/A	I-4400C (UTIL)
34232.3.5	NHPP-026-1(200)13	I-4400C (CONST.)

LOCATION: I-26 BETWEEN US 25 (ASHEVILLE HIGHWAY) TO SOUTH OF NC 280
TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURES, CULVERTS, RETAINING WALLS, SOUND WALLS, REST AREA, SIGNALS, AND SIGNING



VICINITY MAP



NOTE:
1. THIS IS A CONTROLLED-ACCESS PROJECT WITH ACCESS BEING LIMITED TO INTERCHANGES.

★ PROPOSED TRAFFIC SIGNAL

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 2019 = 65,900
ADT 2040 = 91,000
K = 10%
D = 55%
T = 15% *
V = 65 MPH**
* TTST = 11% DUAL 4%
**70MPH SOUTH OF US-25
FUNC CLASS = INTERSTATE
STATEWIDE TIER

PROJECT LENGTH

TOTAL LENGTH OF ROADWAY TIP PROJECT
I-4400C = 3.351 MI

TOTAL LENGTH OF STRUCTURES OF TIP PROJECT
I-4400C = 0.087 MI

TOTAL LENGTH OF TIP PROJECT
I-4400C = 3.438 MI
NOTE: LENGTHS WERE CALCULATED USING THE L 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:
JUNE 29, 2018
(I-4400C)

LETTING DATE:
SEPTEMBER 17, 2019

JOSEPH OLSON, P.E.
PROJECT ENGINEER
MARC A. WHITMORE, P.E.
PROJECT DESIGN ENGINEER
WANDA AUSTIN, P.E.
NCDOT CONTACT

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047948 ENGINEER JOHN M. BLANCETT

DocuSigned by: John Blancett 97162E09E9404ED...
7/11/2019 P.E.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 046784 ENGINEER MARC A. WHITMORE

DocuSigned by: Marc Whitmore 801078EF827B4FE...
7/10/2019 P.E.

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

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8/17/99

REVISIONS

GENERAL NOTES: 2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED:

GRADING AND SURFACING OR RESURFACING AND WIDENING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 AND STD. NO. 225.05 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.02.

SIDE ROADS:

THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

BERM DITCHES:

BERM DITCHES SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 240.01 AT LOCATIONS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

SUBSURFACE DRAINS:

SUBSURFACE DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.02 AT LOCATIONS DIRECTED BY THE ENGINEER.

SHOULDER DRAINS:

SHOULDER DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 816.03 AND DETAILS IN PLANS AT LOCATIONS DIRECTED BY THE ENGINEER.

DRIVEWAYS:

DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.02 USING 3 FOOT RADII OR RADII AS SHOWN ON THE PLANS. LOCATIONS OF DRIVES WILL BE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

STREET TURNOUT:

STREET RETURNS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 848.04 USING THE RADII NOTED ON PLANS.

GUARDRAIL:

THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL.

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACT PRICE FOR "TEMPORARY SHORING".

END BENTS:

THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE
-DUKE POWER - POWER (DISTRIBUTION)
-ATT - COMMUNICATIONS
-CHARTER - COMMUNICATIONS
-PSNC - GAS
-CITY OF ASHEVILLE - WATER
-MSD ENGINEERING - SEWER

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON PLANS.

RIGHT-OF-WAY MARKERS:

ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY OTHERS.

CURB RAMPS:

CURB RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS.
CONSTRUCT ALL CURB RAMPS ACCORDANCE WITH STD 848.05 and/or 848.06.

FENCING:

ALL EXISTING C/A FENCE TO BE REMOVED.

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2018 ROADWAY ENGLISH STANDARD DRAWINGS EFF. 01-16-2018
REV.

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated January, 2018 are applicable to this project and by reference hereby are considered a part of these plans:

STD.NO.	TITLE
DIVISION 2 - EARTHWORK	
200.02	Method of Clearing - Method II
225.01	Guide for Grading Subgrade - Interstate and Freeway
225.02	Guide for Grading Subgrade - Secondary and Local
225.03	Deceleration and Acceleration Lanes
225.04	Method of Obtaining Superelevation - Two Lane Pavement
225.05	Method of Obtaining Superelevation - Divided Highways
225.06	Method of Grading Sight Distance at Intersections
225.09	Guide for Shoulder and Ditch Transition at Grade Separations
240.01	Guide for Berm Ditch Construction
DIVISION 3 - PIPE CULVERTS	
300.01	Method of Pipe Installation
310.10	Driveway Pipe Construction
DIVISION 4 - MAJOR STRUCTURES	
422.01	Bridge Approach Fills - Type I Standard Approach Fill
422.03	Reinforced Bridge Approach Fills - Type A Alternate Approach Fill for Integral Abutment
DIVISION 5 - SUBGRADE, BASES AND SHOULDERS	
560.01	Method of shoulder Construction - High Side of Superelevated Curve - Method I
560.02	Method of Shoulder Construction - High Side of Superelevated Curve - Method II
DIVISION 6 - ASPHALT BASES AND PAVEMENTS	
610.01	Guide for Paving Shoulders Under Bridges - Method I
654.01	Pavement Repairs
665.01	Asphalt Shoulders - Milled Rumble Strips
DIVISION 7 - CONCRETE PAVEMENTS AND SHOULDER	
700.01	Concrete Pavement Joints - Construction and Contraction Joints
700.02	Expansion Joint Layout - for Rigid Doweled Pavement at Bridges
700.03	Dowel Assembly
700.04	Concrete Pavement Header Board
700.05	Tying Proposed Pavement to Existing
710.01	Concrete Pavement - Station Marking
DIVISION 8 - INCIDENTALS	
815.02	Subsurface Drain
816.01	Concrete Pads - For Shoulder Drain Installation
816.02	Aggregate Shoulder Drain
816.03	Geocomposite Shoulder Drain
816.04	Markers for Drainage Structure and Concrete Pad
838.01	Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.11	Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew
838.21	Reinforced Concrete Endwall - for Single 54" Pipe 90 Skew
838.27	Reinforced Concrete Endwall - for Single 60" Pipe 90 Skew
838.45	Notes for Reinforced Concrete Endwall - Std. Dwg 838.21 thru 838.40
838.51	Reinforced Brick Endwall - for Single 54" Pipe 90 Skew
838.57	Reinforced Brick Endwall - for Single 60" Pipe 90 Skew
838.75	Notes for Reinforced Brick Endwall - Std. Dwg 838.51 thru 838.70
838.80	Precast Endwalls - 12" thru 72" Pipe 90 Skew
840.00	Concrete Base Pad For Drainage Structures
840.01	Brick Catch Basin - 12" thru 54" Pipe
840.02	Concrete Catch Basin - 12" thru 54" Pipe
840.03	Frame, Grates and Hood - for Use on Standard Catch Basin
840.14	Concrete Drop Inlet - 12" thru 30" Pipe
840.15	Brick Drop Inlet - 12" thru 30" Pipe
840.16	Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15
840.17	Concrete Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.18	Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.20	Frames and Wide Slot Flat Grates
840.22	Frames and Wide Slot Sag Grates
840.24	Frames and Narrow Slot Sag Grates
840.25	Anchorage for Frames - Brick or Concrete or Precast
840.26	Brick Grated Drop Inlet Type 'A' - 12" thru 72" Pipe
840.27	Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe
840.29	Frames and Narrow Slot Flat Grates
840.31	Concrete Junction Box - 12" thru 66" Pipe
840.32	Brick Junction Box - 12" thru 66" Pipe
840.35	Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates
840.36	Traffic Bearing Grated Drop Inlet - for steel Double Frame and Grates
840.37	Steel Grate and Frame
840.45	Precast Drainage Structure
840.46	Traffic Bearing Precast Drainage Structure
840.51	Brick Manhole - 12" thru 36" Pipe
840.52	Precast Manhole - 4', 5' and 6' Diameter
840.53	Precast Manhole with Masonry Base - 12" thru 42" Pipe
840.54	Manhole Frame and Cover
840.66	Drainage Structure Steps
840.71	Concrete and Brick Pipe Plug
840.72	Pipe Collar
846.01	Concrete Curb, Gutter and Curb & Gutter
846.04	Drop Inlet Installation in Shoulder Berm Gutter
848.01	Concrete Sidewalk
848.02	Driveway Turnout - Radius Type
848.04	Street Turnout
848.05	Curb Ramp - Proposed Curb & Gutter
850.01	Concrete Paved Ditches
850.10	Guide for Berm Drainage Outlet - 15" and 18" Pipe
852.01	Concrete Islands
852.02	Concrete Mountable Median - For Use with Rigid of Flexible Pavement
852.06	Method for Placement of Drop Inlets in Concrete Islands
854.01	Double Faced Concrete Barrier - Types I, II, III and IV
854.05	Concrete Median Transition Barrier - Location of Overhead Assembly
857.01	Precast Reinforced Concrete Barrier - 41" Single Faced
862.01	Guardrail Placement
862.02	Guardrail Installation
862.03	Structure Anchor Units
862.04	Anchoring End of Guardrail - B-77 and B-83 Anchor Units
866.02	Woven Wire Fence - with Wood Post
866.03	Woven Wire Fence - with Steel Post
876.01	Rip Rap in Channels
876.02	Guide for Rip Rap at Pipe Outlets
876.03	Drainage Ditches with Class 'A' Rip Rap
876.04	Drainage Ditches with Class 'B' Rip Rap

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1	I-4400C Title Sheet
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2B-2	Alignment Curve Data
2B-3	Pavement/Bridge Relationship Sketches
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2C-22	Temporary Anchor Unit Type W-Beam
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PROJECT REFERENCE NO.	SHEET NO.
I-4400C	1A

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 046784 ENGINEER MARC A WALTMORE

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PROJECT REFERENCE NO.	SHEET NO.
I-4400C	1B

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

Note: Not to Scale **S.U.E. = Subsurface Utility Engineering*

BOUNDARIES AND PROPERTY:

- State Line
- County Line
- Township Line
- City Line
- Reservation Line
- Property Line
- Existing Iron Pin (EIP)
- Computed Property Corner
- Property Monument (ECM)
- Parcel/Sequence Number (123)
- Existing Fence Line
- Proposed Woven Wire Fence
- Proposed Chain Link Fence
- Proposed Barbed Wire Fence
- Existing Wetland Boundary (WLB)
- Proposed Wetland Boundary (WLB)
- Existing Endangered Animal Boundary (EAB)
- Existing Endangered Plant Boundary (EPB)
- Existing Historic Property Boundary (HPB)
- Known Contamination Area: Soil (S)
- Potential Contamination Area: Soil (S)
- Known Contamination Area: Water (W)
- Potential Contamination Area: Water (W)
- Contaminated Site: Known or Potential

BUILDINGS AND OTHER CULTURE:

- Gas Pump Vent or U/G Tank Cap
- Sign (S)
- Well (W)
- Small Mine
- Foundation
- Area Outline
- Cemetery
- Building
- School
- Church
- Dam

HYDROLOGY:

- Stream or Body of Water
- Hydro, Pool or Reservoir
- Jurisdictional Stream (JS)
- Buffer Zone 1 (BZ 1)
- Buffer Zone 2 (BZ 2)
- Flow Arrow
- Disappearing Stream
- Spring
- Wetland
- Proposed Lateral, Tail, Head Ditch (FLOW)
- False Sump

RAILROADS:

- Standard Gauge (CSX TRANSPORTATION)
- RR Signal Milepost (MILEPOST 35)
- Switch (SWITCH)
- RR Abandoned
- RR Dismantled

RIGHT OF WAY & PROJECT CONTROL:

- Secondary Horiz and Vert Control Point
- Primary Horiz Control Point
- Primary Horiz and Vert Control Point
- Exist Permanent Easement Pin and Cap
- New Permanent Easement Pin and Cap
- Vertical Benchmark
- Existing Right of Way Marker
- Existing Right of Way Line
- New Right of Way Line (RW)
- New Right of Way Line with Pin and Cap (RW)
- New Right of Way Line with Concrete or Granite R/W Marker (RW)
- New Control of Access Line with Concrete C/A Marker (CA)
- Existing Control of Access (CA)
- New Control of Access (CA)
- Existing Easement Line (E)
- New Temporary Construction Easement (E)
- New Temporary Drainage Easement (TDE)
- New Permanent Drainage Easement (PDE)
- New Permanent Drainage / Utility Easement (DUE)
- New Permanent Utility Easement (PUE)
- New Temporary Utility Easement (TUE)
- New Aerial Utility Easement (AUE)

ROADS AND RELATED FEATURES:

- Existing Edge of Pavement
- Existing Curb
- Proposed Slope Stakes Cut (C)
- Proposed Slope Stakes Fill (F)
- Proposed Curb Ramp (CR)
- Existing Metal Guardrail
- Proposed Guardrail
- Existing Cable Guiderail
- Proposed Cable Guiderail
- Equality Symbol
- Pavement Removal

VEGETATION:

- Single Tree
- Single Shrub
- Hedge
- Woods Line
- Orchard
- Vineyard (Vineyard)

EXISTING STRUCTURES:

MAJOR:

- Bridge, Tunnel or Box Culvert (CONC)
- Bridge Wing Wall, Head Wall and End Wall (CONC WW)

MINOR:

- Head and End Wall (CONC HW)
- Pipe Culvert
- Footbridge
- Drainage Box: Catch Basin, DI or JB (CB)
- Paved Ditch Gutter
- Storm Sewer Manhole (S)
- Storm Sewer (S)

UTILITIES:

POWER:

- Existing Power Pole
- Proposed Power Pole
- Existing Joint Use Pole
- Proposed Joint Use Pole
- Power Manhole (P)
- Power Line Tower
- Power Transformer
- U/G Power Cable Hand Hole
- H-Frame Pole
- U/G Power Line LOS B (S.U.E.*) (P)
- U/G Power Line LOS C (S.U.E.*) (P)
- U/G Power Line LOS D (S.U.E.*) (P)

TELEPHONE:

- Existing Telephone Pole
- Proposed Telephone Pole
- Telephone Manhole (T)
- Telephone Pedestal (T)
- Telephone Cell Tower
- U/G Telephone Cable Hand Hole (HH)
- U/G Telephone Cable LOS B (S.U.E.*) (T)
- U/G Telephone Cable LOS C (S.U.E.*) (T)
- U/G Telephone Cable LOS D (S.U.E.*) (T)
- U/G Telephone Conduit LOS B (S.U.E.*) (TC)
- U/G Telephone Conduit LOS C (S.U.E.*) (TC)
- U/G Telephone Conduit LOS D (S.U.E.*) (TC)
- U/G Fiber Optics Cable LOS B (S.U.E.*) (T FO)
- U/G Fiber Optics Cable LOS C (S.U.E.*) (T FO)
- U/G Fiber Optics Cable LOS D (S.U.E.*) (T FO)

WATER:

- Water Manhole (W)
- Water Meter
- Water Valve
- Water Hydrant
- U/G Water Line LOS B (S.U.E*)
- U/G Water Line LOS C (S.U.E*)
- U/G Water Line LOS D (S.U.E*)
- Above Ground Water Line (A/G Water)

TV:

- TV Pedestal (C)
- TV Tower
- U/G TV Cable Hand Hole (HH)
- U/G TV Cable LOS B (S.U.E.*) (TV)
- U/G TV Cable LOS C (S.U.E.*) (TV)
- U/G TV Cable LOS D (S.U.E.*) (TV)
- U/G Fiber Optic Cable LOS B (S.U.E.*) (TV FO)
- U/G Fiber Optic Cable LOS C (S.U.E.*) (TV FO)
- U/G Fiber Optic Cable LOS D (S.U.E.*) (TV FO)

GAS:

- Gas Valve
- Gas Meter
- U/G Gas Line LOS B (S.U.E.*) (G)
- U/G Gas Line LOS C (S.U.E.*) (G)
- U/G Gas Line LOS D (S.U.E.*) (G)
- Above Ground Gas Line (A/G Gas)

SANITARY SEWER:

- Sanitary Sewer Manhole
- Sanitary Sewer Cleanout
- U/G Sanitary Sewer Line (SS)
- Above Ground Sanitary Sewer (A/G Sanitary Sewer)
- SS Forced Main Line LOS B (S.U.E.*) (FSS)
- SS Forced Main Line LOS C (S.U.E.*) (FSS)
- SS Forced Main Line LOS D (S.U.E.*) (FSS)

MISCELLANEOUS:

- Utility Pole
- Utility Pole with Base
- Utility Located Object
- Utility Traffic Signal Box (S)
- Utility Unknown U/G Line LOS B (S.U.E.*) (?UTL)
- U/G Tank; Water, Gas, Oil
- Underground Storage Tank, Approx. Loc. (UST)
- A/G Tank; Water, Gas, Oil
- Geoenvironmental Boring
- U/G Test Hole LOS A (S.U.E.*)
- Abandoned According to Utility Records (AATUR)
- End of Information (E.O.I.)

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REVISIONS

DITCH DETAILS

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PROJECT REFERENCE NO.	SHEET NO.
I-4400C	2D-1

R/W SHEET NO.

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047948 ENGINEER JOHN M. BLANCETT

DocuSigned by: John Blancett 7/12/2019

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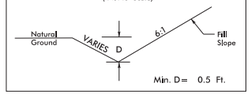
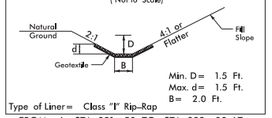
DETAIL A
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D= 0.5 Ft.

FROM –L– STA. 650+50 TO STA. 651+96 RT

DETAIL B
SPECIAL LATERAL BASE DITCH
(Not to Scale)

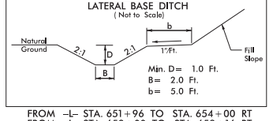


Min. D= 1.5 Ft.
Max. d= 1.5 Ft.
B= 2.0 Ft.

Type of Liner= Class "I" Rip–Rap

FROM –L– STA. 831+50 TO STA. 832+00 LT

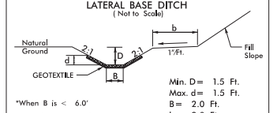
DETAIL C
LATERAL BASE DITCH
(Not to Scale)



Min. D= 1.0 Ft.
B= 2.0 Ft.
b= 5.0 Ft.

FROM –L– STA. 651+96 TO STA. 654+00 RT
FROM –L– STA. 658+00 TO STA. 659+16 RT
FROM –L– STA. 710+00 TO STA. 711+00 LT
FROM –L– STA. 715+00 TO STA. 716+00 LT
FROM –L– STA. 770+50 TO STA. 774+10 LT
FROM –Y10RPC– STA. 10+00 TO STA. 12+35 RT
FROM –Y10RPA– STA. 18+50 TO STA. 19+00 RT

DETAIL D
LATERAL BASE DITCH
(Not to Scale)



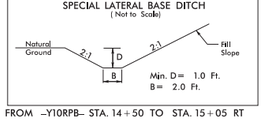
*When B is < 6.0'

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

Type of Liner= Class "I" Rip–Rap

FROM –L– STA. 654+55 TO STA. 656+29 LT
FROM –L– STA. 690+25 TO STA. 691+25 LT
FROM –Y10RPA– STA. 10+00 TO STA. 12+70 RT

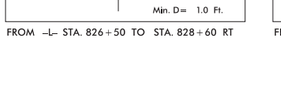
DETAIL E
SPECIAL LATERAL BASE DITCH
(Not to Scale)



Min. D= 1.0 Ft.
B= 2.0 Ft.

FROM –Y10RPB– STA. 14+50 TO STA. 15+05 RT

DETAIL I
LATERAL BASE DITCH
(Not to Scale)



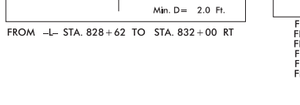
*When B is < 6.0'

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

Type of Liner= Class "I" Rip–Rap

FROM –Y10RPA– STA. 16+08 TO STA. 18+50 RT

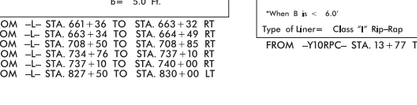
DETAIL J
LATERAL BASE DITCH
(Not to Scale)



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

FROM –L– STA. 716+00 TO STA. 719+50 LT

DETAIL L
CHANNEL CHANGE
(Not to Scale)

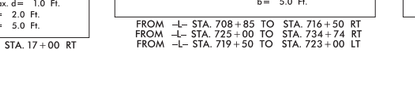


Min. D= 4.0 Ft.
Max. d= 3.5 Ft.
B= 7.0 Ft.
b= 5.0 Ft.

Type of Liner=Class "II" Rip–Rap

FROM –L– STA. 754+50 TO STA. 755+16 RT

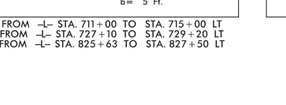
DETAIL M
CHANNEL CHANGE
(Not to Scale)



Min. D= 4.0 Ft.
B= 7.0 Ft.
b= 5.0 Ft.

FROM –L– STA. 747+50 TO STA. 755+40 RT

DETAIL N
LATERAL BASE DITCH
(Not to Scale)



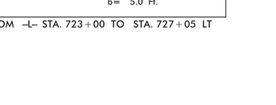
*When B is < 6.0'

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

Type of Liner= Class "B" Rip–Rap

FROM –L– STA. 743+50 TO STA. 745+00 LT

DETAIL O
LATERAL BASE DITCH
(Not to Scale)



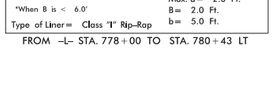
*When B is < 6.0'

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

Type of Liner= Class "B" Rip–Rap

FROM –L– STA. 745+00 TO STA. 746+94 LT

DETAIL P
LATERAL BASE DITCH
(Not to Scale)



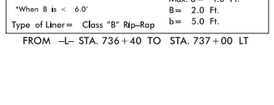
*When B is < 6.0'

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

Type of Liner= Class "I" Rip–Rap

FROM –L– STA. 654+00 TO STA. 657+80 RT
FROM –Y10RPC– STA. 15+00 TO STA. 16+50 RT

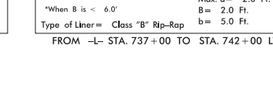
DETAIL Q
SPECIAL LATERAL 'V' DITCH
(Not to Scale)



Min. D= 1.0 Ft.

FROM –Y10RPA– STA. 27+30 TO STA. 27+38 RT &
FROM –Y10RPA_SPUR_RT– STA. 10+00 TO STA. 11+56 RT

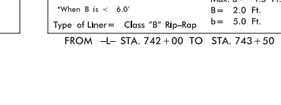
DETAIL R
SPECIAL LATERAL BASE DITCH
(Not to Scale)



Min. D= 0.5 Ft.
B= 2.0 Ft.

FROM –L– STA. 830+00 TO STA. 831+50 LT

DETAIL S
LATERAL BASE DITCH
(Not to Scale)



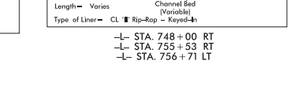
*When B is < 6.0'

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

Type of Liner= Class "I" Rip–Rap

FROM –L– STA. 774+40 TO STA. 776+00 RT

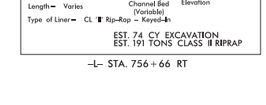
DETAIL T
LATERAL BASE DITCH
(Not to Scale)



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

FROM –L– STA. 769+15 TO STA. 770+84 RT

DETAIL V
SPECIAL LATERAL BASE DITCH
(Not to Scale)



Min. D= 1.0 Ft.
B= 2.0 Ft.

FROM –Y10RPD– STA. 19+00 TO STA. 21+20

DETAIL W
LATERAL BASE DITCH
(Not to Scale)

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

FROM –L– STA. 758+00 TO STA. 761+76 LT

DETAIL X
LATERAL BASE DITCH
(Not to Scale)

*When B is < 6.0'

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

Type of Liner= Class "I" Rip–Rap

FROM –L– STA. 771+10 TO STA. 774+40 RT

DETAIL Y
BERM DITCH
(Not to Scale)

Min. D= 1.5 Ft.

FROM –L– STA. 695+81 TO STA. 701+25 RT

DETAIL Z
BERM DITCH
(Not to Scale)

Type of Liner= COIR FIBER MAT (CFM)

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

FROM –L– STA. 688+30 TO STA. 695+81 RT

DETAIL AA
LATERAL BASE DITCH
(Not to Scale)

Min. D= 0.5 Ft.
B= 2.0 Ft.
b= 5.0 Ft.

FROM –Y10RPB– STA. 15+05 TO STA. 17+00 RT

DETAIL BB
LATERAL BASE DITCH
(Not to Scale)

Min. D= 1.0 Ft.
B= 5.0 Ft.
b= 2.0 Ft.

FROM –L– STA. 740+00 TO STA. 747+50 RT
FROM –L– STA. 769+25 TO STA. 770+50 LT
FROM –Y10RPD– STA. 21+20 TO STA. 25+10 RT

DETAIL CC
SPECIAL LATERAL BASE DITCH
(Not to Scale)

Min. D= 2.0 Ft.
Max. d= 2.0 Ft.
B= 2 Ft.

Type of Liner= Class "I" Rip–Rap

FROM –REST B– STA. 10+00 TO STA. 12+00 LT

DETAIL DD
SPECIAL LATERAL BASE DITCH
(Not to Scale)

Min. D= 1.0 Ft.
Max. d= 1.0 Ft.
B= 2 Ft.

Type of Liner= Class "I" Rip–Rap

FROM –REST B– STA. 12+00 TO STA. 12+80 LT

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

Min. D= 1.0 Ft.

FROM –L– STA. 826+50 TO STA. 828+60 RT

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

Min. D= 2.0 Ft.

FROM –L– STA. 828+62 TO STA. 832+00 RT

DETAIL GG
LATERAL BASE DITCH
(Not to Scale)

Min. D= 0.5 Ft.
B= 2.0 Ft.
b= 5.0 Ft.

FROM –L– STA. 661+36 TO STA. 663+32 RT
FROM –L– STA. 663+34 TO STA. 664+49 RT
FROM –L– STA. 708+50 TO STA. 708+85 RT
FROM –L– STA. 734+76 TO STA. 737+10 RT
FROM –L– STA. 737+10 TO STA. 740+00 RT
FROM –L– STA. 827+50 TO STA. 830+00 LT

DETAIL HH
LATERAL BASE DITCH
(Not to Scale)

*When B is < 6.0'

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

Type of Liner= Class "I" Rip–Rap

FROM –Y10RPC– STA. 13+77 TO STA. 17+00 RT

DETAIL II
LATERAL BASE DITCH
(Not to Scale)

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

FROM –L– STA. 708+85 TO STA. 716+50 RT
FROM –L– STA. 725+00 TO STA. 734+74 RT
FROM –L– STA. 719+50 TO STA. 723+00 LT

DETAIL JJ
LATERAL BASE DITCH
(Not to Scale)

Min. D= 1.0 Ft.
B= 2 Ft.
b= 5 Ft.

FROM –L– STA. 711+00 TO STA. 715+00 LT
FROM –L– STA. 727+10 TO STA. 729+20 LT
FROM –L– STA. 825+63 TO STA. 827+50 LT

DETAIL LL
LATERAL BASE DITCH
(Not to Scale)

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

FROM –L– STA. 723+00 TO STA. 727+05 LT

DETAIL MM
LATERAL BASE DITCH
(Not to Scale)

*When B is < 6.0'

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

Type of Liner= Class "I" Rip–Rap

FROM –L– STA. 778+00 TO STA. 780+43 LT

DETAIL NN
LATERAL BASE DITCH
(Not to Scale)

*When B is < 6.0'

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

Type of Liner= Class "B" Rip–Rap

FROM –L– STA. 736+40 TO STA. 737+00 LT

DETAIL OO
LATERAL BASE DITCH
(Not to Scale)

*When B is < 6.0'

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

Type of Liner= Class "B" Rip–Rap

FROM –L– STA. 737+00 TO STA. 742+00 LT

DETAIL PP
LATERAL BASE DITCH
(Not to Scale)

*When B is < 6.0'

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

Type of Liner= Class "B" Rip–Rap

FROM –L– STA. 742+00 TO STA. 743+50 LT

DETAIL YY
BANK STABILIZATION
(Not to Scale)

Length– Varies

Type of Liner– CL "I" Rip–Rap – Keyed–In

–L– STA. 748+00 RT
–L– STA. 755+53 RT
–L– STA. 756+71 LT

DETAIL ZZ
BANK STABILIZATION
(Not to Scale)

Length– Varies

Type of Liner– CL "I" Rip–Rap – Keyed–In

EST. 74 CY EXCAVATION
EST. 191 TONS CLASS II RIPRAP

–L– STA. 756+66 RT

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HNTB

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8/17/99

REVISIONS

DITCH DETAILS

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-4400C	2D-2
R/W SHEET NO.	

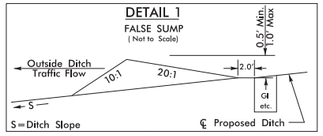
HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047948 ENGINEER JOHN M. BLANCETT

DocuSigned by: John Blancett 7/12/2019
97926D9DF6F44ED...

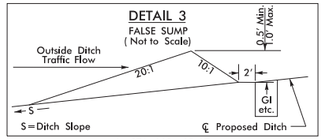
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

DETAIL 1
FALSE SUMP
(Not to Scale)



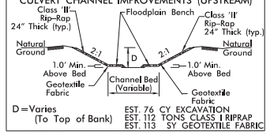
–L– 682+83 RT
–L– 724+98 RT
–L– 789+61 LT
–L– 793+11 LT
–RESTA– 10+65 RT
–L– 810+57 LT

DETAIL 3
FALSE SUMP
(Not to Scale)



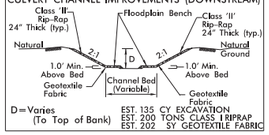
–L– STA. 669+65 LT
–L– STA. 673+90 LT
–L– STA. 678+60 LT
–L– STA. 689+83 RT
–L– STA. 699+85 RT
–L– STA. 704+19 RT
–L– STA. 783+63 RT
–L– STA. 789+60 RT
–L– STA. 793+11 RT
–L– STA. 799+09 RT
–L– STA. 800+84 RT
–Y10RPD– STA. 14+69 LT
–Y10RPD– STA. 11+13 LT

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



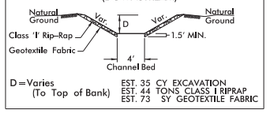
D=Varies (To Top of Bank)
EST. 76 CY EXCAVATION
EST. 112 TONS CLASS I RIPRAP
EST. 113 SY GEOTEXTILE FABRIC

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



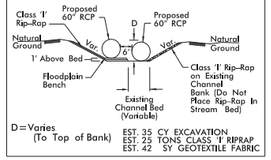
D=Varies (To Top of Bank)
EST. 135 CY EXCAVATION
EST. 200 TONS CLASS I RIPRAP
EST. 202 SY GEOTEXTILE FABRIC

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



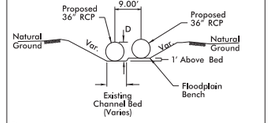
D=Varies (To Top of Bank)
EST. 35 CY EXCAVATION
EST. 44 TONS CLASS I RIPRAP
EST. 73 SY GEOTEXTILE FABRIC

DETAIL DDD
(Not to Scale)
CULVERT CHANNEL IMPROVEMENTS WITH FLOODPLAIN BENCH (UPSTREAM)



D=Varies (To Top of Bank)
EST. 35 CY EXCAVATION
EST. 25 TONS CLASS 'I' RIPRAP
EST. 42 SY GEOTEXTILE FABRIC

DETAIL FFF
(Not to Scale)
CULVERT CHANNEL IMPROVEMENTS WITH FLOODPLAIN BENCH (UPSTREAM)



D=Varies (To Top of Bank)
EST. 28 CY EXCAVATION

10 JUL 2019 10:20
I4400C_ROW_2002_DrainageDetails.dgn
HNTB

DocuSign Envelope ID: 65FC79EE-581D-4686-9B84-FB44D879C6E0

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-4400C	4
R/W SHEET NO.	

ROADWAY DESIGN — NORTH CAROLINA PROFESSIONAL SEAL 046784 ENGINEER MARC A. WHITMORE
DocuSigned by: Marc Whitmore 7/10/2019

HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 047948 ENGINEER JOHN M. BLANCETT
DocuSigned by: John Blancett /11/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

REVISIONS 7/19/2017

MATCHLINE I-4400BB –L– STA 650+50.00

MATCHLINE SHEET 5 –L– STA 664+00.00

NAD 83/NA 2011

WILLIAM RHETT TABER, JR. DB 1258 PG 258

WILLIAM RHETT TABER, III ANDREW PATTON TABER DB 1205 PG 131

SCOTT JARVIS DB 5111 PG 647

GEORGE M. JARVIS DB 799 PG 731

CLASS 'I' RIPRAP EST. 54 TON EST. 90 SYGF DO NOT PLACE RIPRAP IN JS

+36.51 –L– 210.00' LT

+30.00 –L– 200.00' LT 135.00' LT

2' LAT. BASE DITCH SEE DETAIL D EST. 115 TONS EST. 160 SYGF EST. 820 CY DDE

TIE EXIST. STREAM INTO 2' LAT. BASE DITCH

BEGIN WW FENCE +50, 135' LT

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

PROP. WW FENCE

BEGIN SHOULDER BERM GUTTER +50.00

18" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

REMOVE

PLUG AND FLOWABLE FILL

2GI–B FG

FDPS

18" RCP–IV

PROP. GUARDPOST

15" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

300' LANE TAPER

45' TYP.

REMOVE CB

TB2GI–B FG

REMOVE TEMP. SHORING

SINGLE SLOPE CONC. BARRIER

15" RCP–IV

REMOVE DI

GREU TL–3

8:1

SPEC. LAT. V DITCH SEE DETAIL A

BEGIN SHOULDER BERM GUTTER +20.00

BEGIN WW FENCE +50, 135' RT

CLASS 'B' RIPRAP EST. 2 TONS EST. 7 SYGF 15" RCP–IV

PROP. WW FENCE

2' LAT. BASE DITCH SEE DETAIL C

+50.00 –L– 135.00' RT

2' LAT. BASE DITCH SEE DETAIL P EST. 185 TONS EST. 265 SYGF EST. 1,982 CY DDE

PROP. WW FENCE +09, 129' LT

50:1 FDPS TRANSITION FROM 4'–0" AT –L– STA. 657+53 TO 3'–8" AT –L– STA. 657+70

END SHOULDER BERM GUTTER +74.96

END WW FENCE +96, 72' LT

BLIND JB REMOVE HW

REMAINING UNDERMINED

BEGIN RETAINING WALL –RW100– BEGIN WW FENCE –L– STA. 660+13.38, 68.29' LT

TYPE B–77

N 67° 04' 48.8" W

BY1– 22

BL 3

PROP. WW FENCE +00, 165' LT

571' ACCELERATION LANE

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

15" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

RETAINING WALL –RW100–

CONCRETE BARRIER RAIL WITH MOMENT SLAB

+60.00

+21.15

+54.00

27' TYP.

25:1

PLUG AND FLOWABLE FILL

REMOVE CB

TEMP. SHORING

BEGIN NOISE WALL 4.6 662+34.64

RETAINING WALL –RW99–

REMOVE 2GI–B FG

30" RCP–IV

JB W/MH

END WW FENCE +25, 72' RT

END SHOULDER BERM GUTTER +79.50

BEGIN RETAINING WALL –RW99– BEGIN WW FENCE –L– STA. 661+35.16, 68.29' RT

50:1 FDPS TRANSITION FROM 4'–0" AT –L– STA. 658+58 TO 3'–8" AT –L– STA. 658+75

TIE EXIST. JS INTO 2' LAT. BASE DITCH

+08.37 –L– 205.00' RT

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

2' LAT. BASE DITCH SEE DETAIL C EST. 414 CY DDE

TAPERED INLET W/HW – SEE SPECIAL DETAIL

60" RCP–IV

BLIND JB REMOVE HW & 24' OF EX 60" CMP

+00.00 –L– 205.00' RT

PROP. WW FENCE +28, 150' RT

2' LAT. BASE DITCH SEE DETAIL GG EST. 277 CY DDE

2' LAT. BASE DITCH SEE DETAIL GG EST. 112 CY DDE

SINGLE FACED CONCRETE BARRIER WITH MOMENT SLAB

300' LANE TAPER

600' DECELERATION LANE

NOTE:
TEMPORARY SHORING SHOWN FOR INFORMATION ONLY. FOR MORE INFORMATION SEE TMP SHEETS.

FOR CURVE DETAILS, SEE SHEET 2B–2
FOR –EY1– PAVEMENT/BRIDGE RELATIONSHIP SKETCH, SEE SHEET 2B–3
FOR DITCH DETAILS, SEE SHEETS 2D–1, 2D–2
FOR –L– PROFILE, SEE SHEET 23
FOR RETAINING WALL –RW99–, SEE SHEET W–1
FOR RETAINING WALL –RW100–, SEE SHEET W–2

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HNTB

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8/17/99

REVISIONS

FOR –Y10DDI_NB– & –Y10DDI_SB– ALIGNMENT DATA, SEE SHEET 2B–1
FOR CURVE DATA, SEE SHEET 2B–2
FOR –Y10– PAVEMENT/BRIDGE RELATIONSHIP SKETCH, SEE SHEET 2B–3
FOR –Y10DDI (NORTH)– INTERSECTION DETAILS, SEE SHEET 2B–6
FOR –Y10DDI (SOUTH)– INTERSECTION DETAILS, SEE SHEET 2B–7
FOR DITCH DETAILS, SEE SHEETS 2D–1, 2D–2
FOR –L– PROFILE, SEE SHEET 24
FOR –Y10– PROFILE, SEE SHEET 36
FOR –Y10RPA– PROFILE, SEE SHEET 38
FOR –Y10RPB– PROFILE, SEE SHEET 40
FOR –Y10RPC– PROFILE, SEE SHEET 41
FOR –Y10RPD– PROFILE, SEE SHEET 43
FOR RETAINING WALL –RW99–, SEE SHEET W–1
FOR RETAINING WALL –RW100–, SEE SHEET W–2
FOR RETAINING WALL –RW101–, SEE SHEET W–3

PROJECT REFERENCE NO.	SHEET NO.
I-4400C	5

R/W SHEET NO.

ROADWAY DESIGN ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 046784 ENGINEER MARC A. WHITMORE
Docusigned by: Marc Whitmore 7/10/2019
HYDRAULICS ENGINEER: NORTH CAROLINA PROFESSIONAL SEAL 047948 ENGINEER JOHN M. BLANCETT
Docusigned by: John Blancett /11/2019
PLAN IS NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

MATCHLINE SHEET 18 –Y10– STA 324+00.00

END MILL & OVERLAY BEGIN FULL-DEPTH RECONSTRUCTION –Y10– STA. 324+50.00

END RETAINING WALL –RW102– –Y10RPA SPUR RT– STA. 11+61.12, 31.29' RT

WAYNE RAY NEAL DB 1134 PG 60

EDNA LOU RUGGLES

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

15" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

DB 1093 PG 121

–Y10DDI_SB– POC STA. 13+44.28= –Y10– STA. 13+49.37

–Y10DDI_NB– POC STA. 10+00.00

–Y10DDI_SB– PC STA. 10+00.00, 2500' L

–Y10– STA. 324+70.00, 2500' L

–Y10DDI_NB– PT STA. 10+00.00= –Y10DDI_SB– PT STA. 10+00.00

–Y10DDI_NB– PC STA. 10+00.00, 2500' L

–Y10– STA. 324+72.16

–Y10– PC STA. 13+99.37

–Y10– PT STA. 14+69.97

–Y10RPA– SPUR RT– PC STA. 10+00.00 –Y10RPA– STA. 27+38.39, 12.00' RT

NAD 83/NA 2011

675

BEGIN CONSTRUCTION –Y21– STA. 10+42.58

–Y21– PC STA. 10+84.71

–Y21– PT STA. 12+27.81

–Y10RPA– PT STA. 27+38.39

–Y21– PC STA. 13+99.37

–Y21– PT STA. 14+69.97

SPEC. LAT. 'V' DITCH SEE DETAIL Q

REMOVE EXIST. N. CURETON PL WITHIN LIMITS OF CONSTRUCTION –Y21– +40.00 –Y21– 23.67' LT

+00.00 –Y21– 55.00' LT

+00.00 –Y21– 45.00' LT

EGOLF PROPERTIES, LLC DB 1230 PG 385

330

PROP. WW FENCE

RETAINING WALL –RW102– +74.62 –Y10RPA– 50.00' RT

N 62° 56' 02.0" W

Y21

+98.34 –Y10RPA– 60.00' RT

+00.00 –Y10RPA– 50.00' RT

N 47° 22' 35.5" W

S 60° 28' 15.7" E

31' TYP.

24' TYP.

Y10RPA

MATCHLINE SHEET 6 –Y10RPA– STA 23+50.00

GREU TL-3

PROP. WW FENCE –Y10RPB– +53, 106' LT –Y10RPB– +53, 84' LT

RONNIE P. GRAY DB 1253 PG 45

50:1 FDPS TRANSITION FROM 11'-8" AT STA. 15+25 TO 12'-0" AT STA. 15+42

2' LAT. BASE DITCH SEE DETAIL E EST. 21 CY DDE PLUG AND FLOWABLE FILL

TIE 2' SPEC. LAT. BASE DITCH TO EXIST SWALE

WILLIAM RHETT TABER, III ANDREW PATTON TABER DB 1205 PG 131

665

SC STA. 11+89.00

END RETAINING WALL –RW100– –Y10RPB– STA. 15+00.00, 27.29' LT

PROP. WW FENCE

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

CLASS 'I' RIPRAP EST. 15 TONS EST. 25 SYGF

–Y10RPB– CS STA. 13+74.12

–Y10RPB– STA. 15+63.12

480' LANE TAPER

2' LAT. BASE DITCH SEE DETAIL AA EST. 229 CY DDE

SALVADOR R. VASQUES, III, ET AL DB 1325 PG 304

–Y10DDI_NB– POT STA. 10+00.00= –Y10– STA. 324+70.00, 2700' RT

END SHOULDER BERM GUTTER BEGIN 2'-6" C&G +99.41, –Y10RPB–

0.29' –Y10RPB SPUR LT– PC STA. 10+00.00 = –Y10RPB– STA. 12+07.29

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

18" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

PROP. GUARDRAIL

ROW FOR FIRST CLAIM (0.0540 AC)

ESM'T FOR FIRST CLAIM (0.0285 AC)

7 07Z NTEINMAN JONATHAN DB 3151 PG 376

+51.67 –Y10– 85.70' RT

+69.68 –Y10– 92.60' RT

END WW FENCE +70, 90' RT –Y10–

PROP. WW FENCE –Y10RPB– +18, 84' LT

15" RCP-IV

+38.00

CB-F

CB-G

TB2GI-B FG

TB2GI-A FG

2GI-B FG

2GI-B SG

TYPE B-77

TYPE B-71

TYPE B-71A

TYPE B-71B

REMOVE CB

REMOVE MH

REMOVE DI

REMOVE HW

FLOWABLE FILL

PLUG AND FLOWABLE FILL

FDPS

CONC. BARRIER RAIL WITH MOMENT SLAB

15" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

27' TYP.

+81.00

–Y10RPB– BEGIN SHOULDER BERM GUTTER +00.00, –Y10RPB–

–Y10RPB SPUR RT– PC STA. 10+00.00 = –Y10RPB– STA. 19+12.16

B

–L– STA. 664+00.00

MATCHLINE SHEET 4 –L– STA. 664+00.00

SINGLE SLOPE CONC. BARRIER

N 67° 04' 48.8" W

RETAIN AND LINE W/APPROVED LINER

–L– TS STA. 671+73.56

–L– SC STA. 674+43.56

–L– STA. 675+98.33 = –Y10– STA. 332+10.52

–L– TS STA. 679+43.56

–L– ST STA. 682+43.56

MOMENT SLAB W/SOUNDWALL

–Y10RPC– TS STA. 12+00.00

–Y10RPC– SC STA. 12+16.00

–Y10RPC– CS STA. 13+83.89

–Y10RPC– ST STA. 15+99.89

NOISE WALL 4.6

RETAINING WALL –RW099–

BLIND JB

REMOVE 26' OF EX. 60" CMP

60" RCP-IV

TAPERED INLET W/HW – SEE SPECIAL DETAIL

2' LAT. BASE DITCH SEE DETAIL GG SEE SHEET 4 FOR DITCH QUANTITIES

2' LAT. BASE DITCH SEE DETAIL C EST. 133 CY DDE

PROP. WW FENCE –Y10RPC– +96, 101' RT

PROP. WW FENCE –Y10RPC– +38, 89' RT

15" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

2' LAT. BASE DITCH SEE DETAIL HH EST. 285 SYGF EST. 170 CY DDE

400' DOUBLE LANE TAPER

N 52° 25' 00.6" W

600' DECEL LANE

WILLIAM RHETT TABER, III ANDREW PATTON TABER DB 1205 PG 131

END RETAINING WALL –RW099– –Y10RPC– STA. 16+00.00, 27.29' RT

JACKIE PHILIP FISHER DB 580 PG 239

VELDA LEE CUTSHAW DB 589 PG 137

GLORIA D. PIERCY DB 733 PG 780

WILLIAM R. RICE DB 1559 PG 182

WILLIAM R. RICE, ET AL DB 794 PG 783

TIE PROP. TYPICAL DITCH TO PROP. 2' LAT. BASE DITCH

200' LANE TAPER

PROP. WW FENCE –Y10RPC– +18, 97' RT

PROP. WW FENCE –Y10RPC– +30, 84' RT

PROP. WW FENCE –Y10RPC– +88, 135' RT

PROP. WW FENCE –Y10RPC– STA. +79, 104' RT

NOTE: TEMPORARY SHORING SHOWN FOR INFORMATION ONLY. FOR MORE INFORMATION SEE TMP SHEETS.

–Y10RPC– SC STA. 18+72.33 RT

–Y10RPC– CS STA. 19+92.93

–Y10RPC– ST STA. 20+70.43

C

50:1 FDPS TRANSITION FROM 11'-8" AT STA. 19+00 TO 12'-0" AT STA. 19+17

50:1 FDPS TRANSITION FROM 12'-0" AT STA. 675+58 TO 11'-8" AT –L– STA. 675+75

BEGIN SHOULDER BERM GUTTER +50.00, –L–

BEGIN SHOULDER BERM GUTTER +75.00, –Y10RPC–

END NOISE WALL 4.6 & BEGIN GUARDRAIL –Y10RPC– STA. 18+72.33 RT

–Y10RPC– POT STA. 23+24.74

–Y10RPC– SPUR LT– PC STA. 10+00.00= –Y10RPC– STA. 21+41.71, 12.00' LT

–Y10RPA– SPUR LT– PC STA. 10+00.00= –Y10RPA– STA. 25+13.21, 12.00' LT

–Y10RPA– SC STA. 24+57.62

–Y10RPA– CS STA. 23+98.45

TIE TO EXISTING APPROACH SLAB STA. 330+37.09

MAINTAIN EXISTING BRIDGE

PRECAST REINFORCED CONC. BARRIER WITH GUTTER

CLASS 'B' RIPRAP EST. 9 TONS EST. 19 SYGF

MEDIAN HAZARD PROTECTION

A

MATCHLINE SHEET 6 –L– STA 678+00.00

MATCHLINE SHEET 6 –Y10– STA 334+00.00

CLASS 'B' RIPRAP EST. 8 TONS EST. 17 SYGF

BEGIN RETAINING WALL –RW101– –L– STA. 676+00.00, 64.50' RT

–BY2– 25

TIE TO EXISTING APPROACH SLAB STA. 333+95.76

–Y10RPC– POT STA. 23+24.74

–Y10RPC– SPUR LT– PC STA. 10+00.00= –Y10RPC– STA. 21+41.71, 12.00' LT

PLUG AND FLOWABLE FILL PROP. GUARDRAIL

MATCHLINE SHEET 6 –Y10RPC_SPUR_RT– STA 10+10.00

–Y10RPC– SPUR RT– PC STA. 10+00.00= –Y10RPC– STA. 23+24.74, 12.00' RT

+00.00 –Y10RPC– 61.70' RT

+20.00 –Y10RPC– 60.00' RT ROW 66.42' RT PUE

+37.31 –Y10RPC–, 84.09' RT

+36.98 –Y10RPC–, 86.02' RT

+56.70 –Y10RPC–, 89.40' RT

+58.84 –Y10RPC–, 76.90' RT

+73.99 –Y10RPC–, 71.83' RT

PUE

EXISTING

CAT-1

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LNTB

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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-4400C	6
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 046784 ENGINEER MARC A. WHITMORE
DocuSigned by: Marc Whitmore 7/10/2019
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HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047948 ENGINEER JOHN M. BLANCETT
DocuSigned by: John Blancett /11/2019
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DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

7/19/2017

REVISIONS

EGOLF PROPERTIES, LLC
DB 1230 PG 387

STUART I. RUBIN, TRUSTEE
DB 1155 PG 380

NORTH RUGBY PROPERTIES, LLC
DB 1518 PG 334

DISCOVERY ONE LAND HOLDING, LLC
DB 3166 PG 604

HARDEE'S RESTAURANTS, LLC
DB 1529 PG 545

NAD 83/NA 2011

MATCHLINE SHEET 5 –Y10RPA– STA 23+50.00

MATCHLINE SHEET 5 –L– STA 678+00.00

MATCHLINE SHEET 5 –Y10RPC– SPUR_RT STA 10+10.00

MATCHLINE SHEET 5 –Y10– STA 334+00.00

MATCHLINE SHEET 19 –Y10– STA 338+00.00

MATCHLINE SHEET 7 –L– STA 690+00.00

–Y10RPA– ST STA 12+70.00

–Y10RPD– SC STA 20+88.27

–Y10RPD– CS STA 19+44.27

–Y21– PC STA 15+45.45

–Y21– PT STA 16+19.23

–Y21– POT STA 16+64.56

–Y10RPA– TS STA 21+81.45

END CONSTRUCTION –Y21– STA. 16+64.56

+27.31 –Y21– 30.00' LT

CONC. BARRIER RAIL W/MOMENT SLAB

RETAINING WALL –RW102

200' LANE TAPER

PROP. WW. FENCE

BEGIN RETAINING WALL –RW102– –Y10RPA– STA. 20+00.00, 30.31' RT

+50.00 –Y10RPA– 60.00' RT

2' LAT. BASE DITCH SEE DETAIL C

+00.00 –Y10RPA– 100.00' RT FOR CA RW 75.00' RT FOR CA FENCE

CLASS 'I' RIPRAP EST. 35 TONS EST. 59 SYGF

2' LAT. BASE DITCH SEE DETAIL I EST. 180 TONS EST. 250 SYGF EST. 329 CY DDE

36" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

+00.00 –Y10RPA– 115.00' RT FOR CA RW 75.00' RT FOR CA FENCE

+74.87 –Y10RPA– 110.00' RT FOR CA RW

+69.70 –Y10RPA– 96.16' RT FOR CA RW

+00.00 –Y10RPA– 77.26' RT FOR CA RW 60.00' RT FOR CA FENCE

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

+00.00 –Y10RPA– 84.83' RT FOR CA FENCE

+64.62 –Y10RPA– 82.54' RT FOR CA FENCE

2' LAT. BASE DITCH SEE DETAIL D EST. 235 TONS EST. 330 SYGF EST. 611 CY DDE

50:1 FDPS TRANSITION FROM 11'–8" AT STA. 11+20 TO 12'–0" AT STA. 11+37

END SHOULDER BERM GUTTER +20.00 –Y10RPA–

TIE 2' LAT. BASE DITCH TO JS

PROP. GUARDRAIL

24" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

PROP. SHOULDER BERM GUTTER

45' TYP.

25:1 FDPS TRANSITIONS FROM 687+55 TO 12'–0" AT STA. 687+80

25:1 FDPS TRANSITIONS FROM 12'–0" AT STA. 687+20 TO 11'–0" AT STA. 687+45

SINGLE SLOPE CONC. BARRIER

50:1 FDPS TRANSITION FROM 12'–0" AT STA. 19+58 TO 11'–8" AT STA. 19+75

BEGIN SHOULDER BERM GUTTER +00.00 –Y10RPA–

PLUG AND FLOWABLE FILL

400' DOUBLE LANE TAPER

REMOVE

REMOVE DI

REMOVE HW & 44' OF EX 48" CMP

REMOVE HW & 27' OF EX 48" CMP

RETAIN AND LINE W/APPROVED LINER

RETAIN

TEMP. SHORING

600' TAPER

–Y10DDI SB–

–Y10DDI NB–

–Y10–

–Y10RPD–

–Y10RPD_SPUR_RT– PC STA. 10+00.00 = –Y10RPD– STA. 28+92.47

–Y10RPD– PT STA. 28+30.86

–Y10RPD– STA. 27+15.44 = –Y10RPD_SPUR_RT– PC STA. 10+00.00

–Y10RPD_SPUR_RT– STA. 10+00.00 = –Y10RPC_SPUR_RT– STA. 10+10.00

+60.00 –Y10RPC_SPUR_RT–, 40.00' RT

+66.08 –Y10RPC_SPUR_RT– 45.46' RT

–Y10– STA. 336+24.37 =

–Y10DDI_NB– POC STA. 21+71.75

–Y10DDI_SB– POC STA. 21+67.66

+87.53 –Y10RPD– 46.41' LT

+00.00 –Y10RPD– 110.00' LT

+00.00 –Y10RPD– 70.00' LT

TAPERED INLET W/HW – SEE SPECIAL DETAIL

2' LAT. BASE DITCH SEE DETAIL BB EST. 2,064 CY DDE

15" CSP W/ELBOWS – USE ROD & LUG CONNECTORS

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

2' SPEC. LAT. BASE DITCH SEE DETAIL V

BERM DITCH SEE DETAIL Z SEE SHEET 7 FOR QUANTITIES

END RETAINING WALL –RW101– –L– STA. 678+50.00, 64.50' RT

CLASS 'B' RIPRAP EST. 10 TONS EST. 23 SYGF

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

PROP. WW. FENCE –Y10RPD– +10, 60' LT

BEGIN WW FENCE –Y10– 78, 74' LT

NOTE:
TEMPORARY SHORING SHOWN FOR INFORMATION ONLY. FOR MORE INFORMATION SEE TMP SHEETS.

FOR –Y10DDI_NB– and –Y10DDI_SB– ALIGNMENT DATA, SEE SHEET 2B–1
FOR CURVE DATA, SEE SHEET 2B–2
FOR –Y10DDI (NORTH)– INTERSECTION DETAILS, SEE SHEET 2B–6
FOR –Y10DDI (SOUTH)– INTERSECTION DETAILS, SEE SHEET 2B–7
FOR –Y10– PAVEMENT/BRIDGE RELATIONSHIP SKETCH, SEE SHEET 2B–3
FOR DITCH DETAIL, SEE SHEETS 2D–1, 2D–2

FOR –Y10– PROFILE, SEE SHEET 36
FOR –Y10RPA– PROFILE, SEE SHEET 38
FOR –Y10RPD– PROFILE, SEE SHEET 43
FOR – L – PROFILE, SEE SHEET 25
FOR RETAINING WALL –RW102–, SEE SHEET W–4

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HNTB

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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-4400C	7
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 046784 ENGINEER MARC A. WHITMORE

DocuSigned by: Marc Whitmore 7/10/2019
80107BEF8278AFE...

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047948 ENGINEER JOHN M. BLANCETT

DocuSigned by: John Blancett /11/2019
9716DE598E9404FD...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

7/19/2017

REVISIONS

MATCHLINE SHEET 6
–L– STA 690+00.00

690

–Y10RPA– CS STA. 10+00.00

+00.00 –Y10RPA–
86.29' RT FOR CA RW
75.00' RT FOR CA FENCE

2' LAT. BASE DITCH
SEE DETAIL D
SEE SHEET 6 FOR
RIPRAP QUANTITIES
EST. 278 CY DDE

TIE PROP. TYPICAL
CUT DITCH TO
PROP. 2' LAT. BASE
DITCH

+75.00 –L–
125.00' LT
FOR CA FENCE

PLUG AND
FLOWABLE FILL

PROP. GUARDRAIL

GREU TL-3

PROP. WW FENCE

30" RCP-IV
REMOVE DI
45'

PLUG AND
FLOWABLE FILL

REMOVE

REMOVE DI

36" RCP-IV

FLOWABLE FILL

30" RCP-IV

15" RCP-IV

18" RCP-IV

5' RCP-IV

REMOVE 45' OF
EX 30" CMP

PLUG AND
FLOWABLE FILL

REMOVE HW

15" RCP-IV

REMOVE SINGLE SLOPE CONC. BARRIER

24" RCP-IV
REMOVE

REMOVE HW

PLUG AND
FLOWABLE FILL

REMOVE HW

REMOVE DI

REMOVE HW

REMOVE HW

– Y10RPD –

2' SPEC. LAT. BASE DITCH
SEE DETAIL Y

+80.00 –Y10RPD–
76.60' LT

+90.00 –Y10RPD–
103.99' LT

PROP. WW FENCE

BERM DITCH
SEE DETAIL Z
EST. 440 SY CFM

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

15" CSP W/
ELBOWS – USE
ROD & LUG
CONNECTORS

PROP. GUARDRAIL

PROP. SHOULDER
BERM GUTTER

15" CSP W/
ELBOWS – USE
ROD & LUG
CONNECTORS

FLOWABLE
FILL

15" CSP W/
ELBOWS – USE
ROD & LUG
CONNECTORS

PROP. WW FENCE
–Y10RPD– +08, 138' LT

BERM DITCH
SEE DETAIL Y

PROP. WW FENCE
–Y10RPD– +54, 185' LT

PROP. WW FENCE
–Y10RPD– +46, 141' LT

PROP. WW FENCE
–Y10RPD– +47, 151' LT

–Y10RPD– SC
STA. 10+60.00

–Y10RPD– TS
STA. 10+40.00

–L– STA 696+27.28

+25.00 –L–
125.00' LT
FOR CA FENCE

RETAIN

RETAIN (ALL DROP INLETS IN THIS SYSTEM)

DROP INLETS BOLTED
4" PVC BETWEEN EACH

BST CAMPER PARKING

CAMPING WORLD

NORTH RUGBY PROPERTIES, LLC
DB 1518 PG 334

DISCOVERY ONE LAND
HOLDING, LLC
DB 385, PG 604

EDWARD H. OWENBEY
DB 625 PG 913

TINA M. CORN
DB 1062 PG 658

WENDELL L.
WILKIE
DB 794 PG 647

JAMES E. HANNEN
DB 1073 PG 374

DEBORAH LEE HENDERSON
DB 1397 PG 642

PATRICK J. STEVENS
DB 1397 PG 19

MACK D. FRANKLIN
DB 383 PG 271

ADMIRAL D. WILLIAMS, TRUSTEE
THE WILLIAMS FAMILY TRUST
DB 1472 PG 240

N 28°51'54.3" W

MATCHLINE SHEET 8
–L– STA 704+00.00

NAD 83/NA 2011

FOR CURVE DATA, SEE SHEET 2B–2
FOR DITCH DETAIL, SEE SHEETS 2D–1, 2D–2
FOR –Y10RPA– PROFILE, SEE SHEET 38
FOR –L– PROFILE, SEE SHEET 25 & 26

10-JUL-2019 13:29
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7/19/2017

REVISIONS

PROJECT REFERENCE NO.	SHEET NO.
I-4400C	8
R/W SHEET NO.	

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

ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 046784 ENGINEER MARC A. WHITMORE	NORTH CAROLINA PROFESSIONAL SEAL 047948 ENGINEER JOHN M DI BIANCETT
Docusigned by: Marc Whitmore 7/10/2019 B0167BEFB734FE...	Docusigned by: John Biancett 7/11/2019 97162E09E9404ED...

T NOT C IAL UNLESS ALL SIGNATURES COMPLETED

NAD 83/NA 2011

MATCHLINE SHEET 7
–L– STA 704+00.00

MATCHLINE SHEET 9
–L– STA 718+00.00

MATCHLINE SHEET 20
–Y11– STA STA 19+50.00

★ PROPOSED TRAFFIC SIGNAL

FOR CURVE DATA, SEE SHEET 2B–2
FOR –Y11– PAVEMENT/BRIDGE RELATIONSHIP SKETCH, SEE SHEET 2B–3
FOR –L– PROFILE, SEE SHEET 26 & 27
FOR –Y11– INTERSECTION DETAIL, SEE SHEET 2B–9
FOR DITCH DETAIL, SEE SHEETS 2D–1, 2D–2
FOR –Y11– PROFILE, SEE SHEET 45
FOR –Y23– PROFILE, SEE SHEET 49
FOR RETAINING WALL –RW103–, SEE SHEET W–5
FOR RETAINING WALL –RW104–, SEE SHEET W–6

NOTE:
TEMPORARY SHORING SHOWN FOR INFORMATION ONLY. FOR MORE INFORMATION SEE TMP SHEETS.

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PROJECT REFERENCE NO.	SHEET NO.
I-4400C	9
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 046784 ENGINEER MARC A. WHITMORE
DocuSigned by: Marc Whitmore 7/10/2019

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047948 ENGINEER JOHN M. BLANCETT
DocuSigned by: John Blancett 7/11/2019

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REVISIONS
7/19/2017

NAD 83/NA 2011

MARY LOUISE CORN, ET AL
DB 1337 PG 65

LORA J. HOLCOMBE
DB 893 PG 763

JUDY JONES
DB 820 PG 234

MARY LOUISE CORN, ET AL
DB 1337 PG 65

ROCKWELL HEAVY VEHICLE SYSTEMS, INC.
DB 911 PG 574

MATCHLINE SHEET 8
–L– STA 718+00.00

MATCHLINE SHEET 10
–L– STA 732+00.00

2' LAT. BASE DITCH SEE DETAIL J
CLASS 'B' RIPRAP EST. 2 TONS EST. 7 SYGF
PROP. WW FENCE
15" CSP W/ELBOWS – USE ROD & LUG CONNECTORS
2' LAT. BASE DITCH SEE DETAIL II
PROP. GUARDRAIL
PROP. SHOULDER BERM GUTTER
CLASS 'I' RIPRAP EST. 47 TONS EST. 80 SYGF
2' LAT. BASE DITCH SEE DETAIL LL
CLASS 'B' RIPRAP EST. 2 TONS EST. 7 SYGF
15" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS
2' LAT. BASE DITCH SEE DETAIL JJ EST. 197 CY DDE
CLASS 'B' RIPRAP EST. 1 TONS EST. 5 SYGF
36" WELDED STEEL PIPE 0.500" WALL THICKNESS TRENCHLESS INSTALLATION
RETAIN AND LINE W/APPROVED LINER
SINGLE SLOPE CONC. BARRIER
NOISE WALL 5.3
MOMENT SLAB W/ NOISE WALL
CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL
CLASS 'B' RIPRAP EST. 3 TONS EST. 5 SYGF
UPSTREAM CULVERT CHANNEL IMPROVEMENTS WITH FLOODPLAIN BENCH SEE DETAIL FFF
FS-1 (ELEV. 2088.0)
END MOMENT SLAB WITH NOISE WALL BEGIN SHOULDER BERM GUTTER & GUARDRAIL –L– STA. 723+80.02 RT
END NOISE WALL 5.3 –L– STA. 723+80.02 RT
2' LAT. BASE DITCH SEE DETAIL II EST. 1,429 CY DDE

FOR CURVE DATA, SEE SHEET 2B–2
FOR DITCH DETAIL, SEE SHEETS 2D–1, 2D–2
FOR –L– PROFILE, SEE SHEET 27 & 28

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PROJECT REFERENCE NO.	SHEET NO.
I-4400C	10

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 046784 ENGINEER MARC A. WHITMORE

DocuSigned by: Marc Whitmore 7/10/2019

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047948 ENGINEER JOHN M. BLANCETT

DocuSigned by: John Blancett /11/2019

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7/19/2017

REVISIONS

NAD 83/NA 2011

735 740 745

MATCHLINE SHEET 9
–L– STA 732+00.00

MATCHLINE SHEET 11
–L– STA 746+00.00

25 BIG J. SMALL J. PARTNERSHIP DB 985 PG 70

+59.90 –L– 150.00' LT

+40.17 –L– 135.00' LT

MARY LOUISE CORN, ET AL DB 1337 PG 65

PROP. WW FENCE

PROP. GUARDRAIL

PROP. SHOULDER BERM GUTTER

2' LAT. BASE DITCH SEE DETAIL NN EST. 35 TONS EST. 75 SYGF

15" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

2' LAT. BASE DITCH SEE DETAIL OO EST. 350 TONS EST. 780 SYGF EST. 1,650 CY DDE

2' LAT. BASE DITCH SEE DETAIL PP EST. 105 TONS EST. 235 SYGF

15" CSP W/ELBOWS – USE ROD & LUG CONNECTORS

2' LAT. BASE DITCH SEE DETAIL N EST. 80 TONS EST. 185 SYGF

2' LAT. BASE DITCH SEE DETAIL O EST. 85 TONS EST. 190 SYGF

30" RCP–IV

REMOVE 14' OF EX. 24" RCP

PLUG AND FLOWABLE FILL

REMOVE DI

SINGLE SLOPE CONC. BARRIER

– L –

N 28° 51' 54.3" W

N 28° 47' 07.9" W

N 28° 47' 52.9" W

2GI–A FG

TB2GI–B FG

2GI–B FG

15" RCP–IV

REMOVE

FLOWABLE FILL

REMOVE HW

2' LAT. BASE DITCH SEE DETAIL II SEE SHEET 9 FOR QUANTITIES

2' LAT. BASE DITCH SEE DETAIL GG EST. 157 CY DDE

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

2' LAT. BASE DITCH SEE DETAIL GG EST. 5,320 CY DDE

+00.00 –L– 135.00' RT

+00.00 –L– 165.00' RT

2' LAT. BASE DITCH SEE DETAIL BB

15" CSP W/ELBOWS – USE ROD & LUG CONNECTORS

15" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

24" RCP RETAIN

48" WW & ISBW

SHOULDER DRAIN OUTLET

EXISTING R/W

BM #11

BM #12

METAL ACCESS DOORS

8" PVC

8" VC

12' FDPS

48' 02 02

24 ROCKWELL HEAVY VEHICLE SYSTEMS, INC. DB 911 PG 574

FOR CURVE DATA, SEE SHEET 2B–2
FOR DITCH DETAIL, SEE SHEETS 2D–1, 2D–2
FOR –L– PROFILE, SEE SHEET 28 & 29

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NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4400C	11
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 046784 ENGINEER MARC A. WHITMORE
DocuSigned by: Marc Whitmore 7/10/2019

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047948 ENGINEER JOHN M. BLANCETT
DocuSigned by: John Blancett 7/11/2019

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REVISIONS

MATCHLINE SHEET 10
–L– STA 746+00.00

MATCHLINE SHEET 12
–L– STA 760+00.00

NAD 83/NA 2011

750 755 760

BIG J. SMALL J. PARTNERSHIP
DB 985 PG 70

WARRIOR GOLF MANAGEMENT, LLC
DB 1422 PG 693

ROCKWELL HEAVY VEHICLE SYSTEMS, INC.
DB 911 PG 574

RUGBY GRANGE FARMS, LLC
DB 1589 PG 340

2' LAT. BASE DITCH SEE DETAIL O SEE SHEET 10 FOR QUANTITIES

+50.00 –L– 150.00' LT

+00.00 –L– 135.00' LT

TIE 2' LAT. BASE DITCH INTO EDGE OF WETLAND

CLASS 'B' RIPRAP EST. 3 TONS EST. 5 SYGF

CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL

PROP. WW FENCE

15" CSP W/ELBOWS – USE ROD & LUG CONNECTORS

PROP. SHOULDER BERM GUTTER

PROP. GUARDRAIL

2GI-B FG

SHOULDER DRAIN OUTLET

FDPS

SINGLE SLOPE CONC. BARRIER

– L – N 28° 51' 54.3" W

N 29° 16' 33.4" W

REMOVE

15" RCP-IV

TB2GI-B FG

50:1 FDPS TRANSITION FROM 12'–0" AT –L– STA. 753+50 TO 9'–8" AT –L– STA. 754+74

+00.00 –L– 155.00' LT

+90.00 –L– 135.00' LT

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

24" CSP W/ELBOWS – USE ROD & LUG CONNECTORS

PLUG AND FLOWABLE FILL

+50.00

+86.00

42' TYP.

TYPE B–77

TEMP. SHORING

REMOVE DI

A/G SEWER LINE ABANDONED

CANNOT LOCATE NEXT SS MH

PROP. WW FENCE +99, 135' LT

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

+00.00 –L– 155.00' LT

+20.00 –L– 135.00' LT

END SHOULDER BERM GUTTER +73.83

END WW FENCE +99, 78' LT

BANK STABILIZATION SEE DETAIL YY EST. 153 TONS

PROPOSED BRIDGE BENTS

CAME CREEK

PROP. WW FENCE +43 135' LT

50:1 FDPS TRANSITION FROM 9'–8" AT –L– STA. 757+68 TO 12'–0" AT –L– STA. 758+90

BEGIN WW FENCE +43, 78' LT

BEGIN SHOULDER BERM GUTTER +68.17

+90.00

+54.00

TEMP. SHORING

SINGLE SLOPE CONC. BARRIER

N 29° 27' 44.0" W

REMOVE CB

–BL– 10

2' LAT. BASE DITCH SEE DETAIL BB

15" CSP W/ELBOWS – USE ROD & LUG CONNECTORS

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

TIE EXIST. STREAM TO PROP. CHANNEL CHANGE

CHANNEL CHANGE SEE DETAIL M EST. 4,467 CY DDE

BANK STABILIZATION SEE DETAIL YY EST. 74 TONS

50:1 FDPS TRANSITION FROM 12'–0" AT –L– STA. 753+50 TO 9'–8" AT –L– STA. 754+74

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

CHANNEL CHANGE SEE DETAIL L EST. 207 TONS EST. 209 SYGF

+47.08 –L– 165.00' RT

BANK STABILIZATION SEE DETAIL ZZ

BANK STABILIZATION SEE DETAIL YY EST. 134 TONS

N 66°14'46" E 166.58'

CANE CREEK

N 75°53'49" E 206.56'

NOTE:
TEMPORARY SHORING SHOWN FOR INFORMATION ONLY. FOR MORE INFORMATION SEE TMP SHEETS.

FOR CURVE DATA, SEE SHEET 2B–2
FOR CANE CREEK PAVEMENT/BRIDGE RELATIONSHIP SKETCH, SEE SHEET 2B–3
FOR DITCH DETAIL, SEE SHEETS 2D–1, 2D–2
FOR –L– PROFILE, SEE SHEET 29 & 30

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NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4400C	12
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 046784 ENGINEER MARC A WHITMORE
DocuSigned by: Marc Whitmore 7/2019

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047948 ENGINEER JOHN M BLANCETT
DocuSigned by: John Blancett 7/2019

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7/19/2017

REVISIONS

NAD 83/NA 2011

MATCHLINE SHEET 11
–L– STA 760+00.00

MATCHLINE SHEET 13
–L– STA 774+00.00

(26) WARRIOR GOLF MANAGEMENT, LLC
DB M22 PG 693

(27) RUGBY GRANGE FARMS, LLC
DB I589 PG 340

760 765 770

INV=2047.58' 12" CMP
INV=2048.34'
INV=2046.22' 15" CMP I–26 EB
INV=2052.73'
INV=2053.21'
INV=2052.87'
INV=2066.42'
INV=2066.18'
INV=2064.78'
INV=2052.91'
INV=2054.31'

+15.00 –L– 160.00' LT
+60.00 –L– 160.00' LT
+00.00 –L– 135.00' LT
+75.00 –L– 135.00' LT
+50.00 –L– 150.00' LT
+40.00 –L– 135.00' LT
+35.00 –L– 150.00' LT
+45.00 –L– 135.00' LT
42' TYP.
+03.25
+15.00 –L– 135.00' LT
+90.00 –L– 170.00' LT
+00.00 –L– 135.06' LT
+00.00

CLASS 'B' RIPRAP EST. 2 TONS EST. 7 SYGF
PROP. WW FENCE
PROP. SHOULDER BERM GUTTER
PROP. GUARDRAIL
18" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS
DOWNSTREAM CULVERT CHANNEL IMPROVEMENTS SEE DETAIL CCC
60" RCP–IV BLIND JB
15" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS
CLASS 'B' RIPRAP EST. 1 TON EST. 5 SYGF
END WW FENCE –L– +56, 115' LT
EXTEND 3 @ 7' X 7' RCBC HW W/WINGWALLS
DOWNSTREAM CULVERT CHANNEL IMPROVEMENTS SEE DETAIL BBB
PROP. WW FENCE –L– +14, 135' LT
REMOVE HW & WINGWALLS
BEGIN WW FENCE –L– +08, 116' LT
300' LANE TAPER
743' ACCELERATION LANE
2' LAT. BASE DITCH SEE DETAIL BB
2' LAT. BASE DITCH SEE DETAIL C EST. 250 CY DDE
PROP. WW FENCE
CLASS 'B' RIPRAP EST. 2 TONS EST. 7 SYGF
15" CSP W/ELBOWS – USE ROD & LUG CONNECTORS
SHOULDER DRAIN WITH CLEANOUT
7' X 7' TRIPLE BARREL CULVERT –L– STA. 769+93.36
REMOVE DI
REMOVE
REMOVE HW & WINGWALLS
BEGIN WW FENCE –L– +36, 111' RT
EXTEND 3 @ 7' X 7' RCBC HW W/WINGWALLS
UPSTREAM CULVERT CHANNEL IMPROVEMENTS SEE DETAIL AAA
15" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS
PROP. WW FENCE
2' LAT. BASE DITCH, SEE DETAIL X EST. 325 TONS EST. 460 SYGF EST. 406 CY DDE
300' LANE TAPER
+40.00 –L– 134.94' RT 150.00' RT
+45.00 –L– 134.94' RT +60.00 –L– 155.00' RT
PROP. WW FENCE –L– +47, 135' RT
+70.00 –L– 134.94' RT
+85.00 –L– 150.00' RT
2' LAT. BASE DITCH SEE DETAIL T EST. 106 CY DDE
END WW FENCE –L– 78, 111' RT
PROP. WW FENCE –L– +75, 135' RT

1201 1202 1203 1204 1205 1206 1207 1208 1209 1210 1211 1212 1213 1214 1215 1216 1250 1251 1252 1253 1260 1261 1262 1263

TB2GI–B FG 2GI–B FG FDPS SINGLE SLOPE CONC. BARRIER
18" RCP–IV 15" RCP–IV 60" RCP–IV 60" WELDED STEEL PIPE 0.875" WALL THICKNESS TRENCHLESS INSTALLATION
PLUG AND FLOWABLE FILL
–BL– 11 –BL– 12 –L–
N 28° 51' 54.3" W
N 27° 38' 06" W
Δ= 45°11'15"
25:1 FDPS TRANSITIONS FROM 12'–0" AT STA. 766+70 TO 11'–0" AT STA. 766+95
25:1 FDPS TRANSITIONS FROM 11'–0" AT STA. 767+05 TO 12'–0" AT STA. 767+30
BLIND JB
CLASS 'B' RIPRAP EST. 1 TON EST. 5 SYGF
CLASS 'B' RIPRAP EST. 3 TONS EST. 5 SYGF
CONCRETE ENERGY DISSIPATOR SEE SPECIAL DETAIL
UPSTREAM CULVERT CHANNEL IMPROVEMENTS WITH FLOODPLAIN BENCH SEE DETAIL DDD
15" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS
–L– TS STA. 768+03.25
–L– SC STA. 769+08.25

FOR CURVE DATA, SEE SHEET 2B–2
FOR DITCH DETAIL, SEE SHEETs 2D–1, 2D–2
FOR –L– PROFILE, SEE SHEET 30 & 31

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Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4400C	13
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 046784 ENGINEER MARC A. WHITMORE
DocuSigned by: Marc Whitmore 7/10/2019
80107BEF8278AFE...

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047948 ENGINEER JOHN M. BLANCETT
DocuSigned by: John Blancett 7/11/2019
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7/19/2017

REVISIONS

MATCHLINE SHEET 12
–L– STA 774+00.00

MATCHLINE SHEET 14
–L– STA 788+00.00

NAD 83/NA 2011

FRENCH BROAD ASSOCIATES
DB 821PG III

NORTH CAROLINA DEPT. OF TRANS.
DB 732 PG 626

RUGBY GRANGE FARMS, LLC
DB 1589 PG 340

THE LANCE FAMILY CORPORATION, INC.
DB 1613 PG 429

SUSAN ELIZABETH LANCE, ET AL
DB WILL PG BUNC IE
(DB 625 PG 291)

–RESTB– TS Sta. 10+00.00
–RESTB– SC Sta. 11+89.00
–RESTB– PT Sta. 12+94.95
–RESTB– POT Sta. 17+00.00
–RESTC– TS STA. 10+00.00
–RESTC– SC STA. 10+63.00
–RESTC– CS STA. 13+44.59
–RESTC– ST STA. 14+07.59
–RESTC– POT STA. 17+50.00

743' ACCELERATION LANE
640' DECELERATION LANE

FOR CURVE DATA, SEE SHEET 2B-2
FOR DITCH DETAIL, SEE SHEETS 2D-1, 2D-2
FOR –RESTB– PROFILE, SEE SHEET 47
FOR –RESTC– PROFILE, SEE SHEET 47
FOR –L– PROFILE, SEE SHEET 31 & 32

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PROJECT REFERENCE NO.	SHEET NO.
I-4400C	14
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 046784 ENGINEER MARC A. WHITMORE
DocuSigned by: Marc Whitmore 7/10/2019
B0107BEF8378AFE...

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047948 ENGINEER JOHN M. DI ANCETT
DocuSigned by: John Diancett /11/2019
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7/19/2017

REVISIONS

CITY OF ASHEVILLE
DB 1906 PG 324

NORTH CAROLINA DEPT. OF TRANS DB 732 PG 626

EXISTING R/W

NAD 83/NA 2011

REST ROOM BLDG
ISF REST AREA
VENDING

BUNCOMBE COUNTY
HENDERSON COUNTY

REST-A
REST-B
REST-C
REST-D

-RESTA- POT Sta. 17+00.00

PROP. WW FENCE -RESTA- +96, 105' RT

PROP. WW FENCE -RESTA- +58, 94' RT

PROP. WW FENCE

TIE TO PROP. REST AREA RAMP +00.00

TIE TO PROP. REST AREA RAMP +25.00

-RESTA- S 8° 28' 47.7" E

-RESTD- S 16° 13' 18.7" E

-RESTD- POT Sta. 17+25.00

-L- STA 788+00.00

MATCHLINE SHEET 13

-L- STA 802+00.00

MATCHLINE SHEET 15

-L- CS STA 789+94.17

-L- TS STA 790+99.17

-L- SINGLE SLOPE CONC. BARRIER

N 12° 24' 36.8" W

N 12° 25' 59.5" W

PROP. GUARDRAIL

REMOVE DI

REMOVE

REMOVE HW

REMOVE CB

PLUG AND FLOWABLE FILL

FLOWABLE FILL

2GI-B SG 1404

2GI-A FG 1403

2GI-B FG 1413

2GI-A FG 1411

2GI-B FG 1410

2GI-A FG 1409

2GI-B SG 1414

2GI-B SG 1412

2GI-B SG 1401

2GI-B FG 1402

2GI-B FG 1406

2GI-A FG 1407

2GI-B SG 1408

2GI-A FG 1416

FS-1

FS-3

CAT-1

GREU TL-3

BL- 14

BL- 15

42' TYP.

28' TYP.

8' TYP.

12' FDPS

14' FDPS

4' FDPS

24" RCP-IV

18" RCP-IV

15" RCP-IV

36" RCP-IV

30" RCP-IV

12" RCP-IV

SUSAN ELIZABETH LANCE, ET AL
DB WILL PG BUNC IE
(DB 625 PG 291)

STARLING B. UNDERWOOD
DB 1500 PG 272

PROP. WW FENCE -RESTD- 17+25, 91' LT

FOR CURVE DATA, SEE SHEET 2B-2
FOR DITCH DETAIL, SEE SHEETS 2D-1, 2D-2
FOR -L- PROFILE, SEE SHEET 32 & 33
FOR -RESTA- PROFILE, SEE SHEET 46
FOR -RESTB- PROFILE, SEE SHEET 47
FOR -RESTC- PROFILE, SEE SHEET 47
FOR -RESTD- PROFILE, SEE SHEET 48
FOR REST AREA DETAIL, SEE REST AREA PLANS

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NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4400C	15

R/W SHEET NO.

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 046784 ENGINEER MARC A. WHITMORE

DocuSigned by: Marc Whitmore 7/10/2019
80107BEF8278AFE...

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047948 ENGINEER JOHN M. BLANCETT

DocuSigned by: John Blancett 7/11/2019
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7/19/2017

REVISIONS

NAD 83/NA 2011

CITY OF ASHEVILLE
DB 1906 PG 324

STATE OF NORTH CAROLINA
DB 917 PG 605

805

810

–RESTA– ST Sta. 12+35.49

–RESTA– CS Sta. 11+72.49

–RESTA– SC Sta. 10+63.00

–RESTA– TS Sta. 10+00.00

RETAIN

PROP. WW FENCE

PROP. WW FENCE –RESTA– +02, 119' RT

PROP. WW FENCE –RESTD– +04, 98' RT

TEMP. SHORING

PROP. WW FENCE +38, 165' LT

BEGIN RETAINING WALL –RW106– –L– STA. 814+65.00, 92.50' LT

END WW FENCE +06, 106' LT

END RETAINING WALL –RW106– –L– STA. 816+00.00, 92.50' LT

981' DECELERATION LANE

MATCHLINE SHEET 21 –Y12– STA 21+40.00

MATCHLINE SHEET 14 –L– STA 802+00.00

MATCHLINE SHEET 16 –L– STA 816+00.00

–RESTA–

S 8° 28' 47.7" E

REST A

REST C

–RESTD–

S 16° 13' 18.7" E

–BL– 16

N 12° 25' 59.5" W

N 11° 38' 51.5" E

SINGLE SLOPE CONC. BARRIER

REMOVE HW

REMOVE CB

REMOVE

PLUG AND FLOWABLE FILL

PROP. SHOULDER BERM GUTTER

PROP. GUARDRAIL

BEGIN SHOULDER BERM GUTTER +00.00 –RESTD–

BEGIN GUARDRAIL +50.00, 138' RT.

BEGIN RETAINING WALL –RW105– –L– STA. 812+50.00, 92.50' RT

END SHOULDER BERM GUTTER +50.00

END GUARDRAIL +25.00, 138' RT.

781' ACCELERATION LANE

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

CLASS 'B' RIPRAP EST. 5 TONS EST. 10 SYGF

15" CSP W/ELBOWS – USE ROD & LUG CONNECTORS

MEDIAN HAZARD PROTECTION TEMP. SHORING

PROP. WW FENCE +11, 135' RT

+81.53 –L– 134.75' RT.

+45.00 –L– 155.00' RT 134.75' RT

+78.80 –L– 159.60' RT

END WW FENCE +88, 105' RT

END C&G +10.00 –Y12–

BEGIN WW FENCE +44, 105' RT

+97.23 –Y12– 50.00' LT

MATCHLINE SHEET 22 –Y12– STA 25+25.00

RENATE J. PACHECO DB 1537 PG 224

CARA B. BRANCKER DB 1577 PG 264

BEATRIZ DELGADO DB 1340 PG 344

KERRY J. McBRIDE DB 1201PG 229

JONATHAN MAXWELL DB 1229 PG 555

DOUGLAS J. JONES DB 986 PG 341

JANICE GOODE DB 922 PG 757

ISF FELLOWSHIP HALL

BOILING SPRINGS BAPTIST CHURCH DB 1198 PG 65

MMJ INVESTMENTS LLC DB 4401PG 1291

FOR CURVE DATA, SEE SHEET 2B–2
FOR –RESTA– PROFILE, SEE SHEET 46
FOR –RESTD– PROFILE, SEE SHEET 48
FOR –Y12– INTERSECTION DETAIL, SEE SHEET 2B–11
FOR DITCH DETAIL, SEE SHEETS 2D–1, 2D–2
FOR –L– PROFILE, SEE SHEET 33 & 34
FOR –Y12– PROFILE, SEE SHEET 45
FOR RETAINING WALL –RW105–, SEE SHEET W–7
FOR RETAINING WALL –RW106–, SEE SHEET W–8

NOTE:
TEMPORARY SHORING SHOWN FOR INFORMATION ONLY. FOR MORE INFORMATION SEE TMP SHEETS.

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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-4400C	16
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 046784 ENGINEER MARC A. WHITMORE

DocuSigned by: Marc Whitmore 7/10/2019

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047948 ENGINEER JOHN M. BLANCETT

DocuSigned by: John Blancett 7/11/2019

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REVISIONS 7/19/2017

ISMBUS

NAD 83/NA 2011

MINKLES, LLC
DB 2798 PG 490

ISMTLBUS

WATER TANK

RETAIN

INV=218.28

–L– TS STA. 818+42.04

–L– SC STA. 820+94.04

–L– CS STA. 826+93.32

MATCHLINE SHEET 15
–L– STA 816+00.00

MATCHLINE SHEET 17
–L– STA 828+00.00

PROP. WW FENCE
+13, 135' LT

BEGIN SHOULDER BERM GUTTER
+00.00

300' LANE TAPER

TYPE B-77

REMOVE CB

REMOVE DI

REMOVE HW

24" RCP-IV

15" RCP-IV

PLUG AND FLOWABLE FILL

FLOWABLE FILL

2GI-A FG

2GI-B FG

2GI-A SG

2GI-B SG

FDPS

PROP. GUARDRAIL

PROP. WW FENCE

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

CLASS 'B' RIPRAP
EST. 8 TON
EST. 16 SYGF

END OF RETAINING WALL –RW105–
–L– STA. 817+00.00, 92.50' RT

PROP. SHOULDER BERM GUTTER

PIPE COLLAR

SINGLE SLOPE CONC. BARRIER

N 18° 50' 28.4" W

N 12° 25' 59.5" W

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

+50.00 –L– 134.66' LT

+35.00 –L– 150.00' LT

+00.00 –L– 150.00' LT

+90.00 –L– 134.65' LT

36" CSP W/ ELBOWS – USE ROD & LUG CONNECTORS

TIE 2' LAT. BASE DITCH TO EXIST. SWALE

2' LAT. BASE DITCH
SEE DETAIL JJ

2' LAT. BASE DITCH
SEE DETAIL GG
EST. 377 CY DDE

300' LANE TAPER

SPEC. LAT. V DITCH
SEE DETAIL EE

MMJ INVESTMENTS, LLC
DB 4401PG 1291

AMERICAN EAGLE INVESTMENTS, LLC
DB 3509 PG 713

L & R RENTALS
DB 2098 PG 735

ISBLKBUS

ISBKBUS

FOR CURVE DATA, SEE SHEET 2B–2
FOR DITCH DETAIL, SEE SHEETS 2D–1, 2D–2
FOR –L– PROFILE, SEE SHEET 34 & 35
FOR RETAINING WALL –RW105–, SEE SHEET W–7

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8/17/99

REVISIONS

HNTB NORTH CAROLINA, P.C.
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Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4400C	17
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 046784 ENGINEER MARC A. WHITMORE
DocuSigned by: Marc Whitmore 7/10/2019

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047948 ENGINEER JOHN M. BLANCETT
DocuSigned by: John Blancett 7/11/2019

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NAD 83/NA 2011

MATCHLINE SHEET 16
–L– STA 828+00.00

–L– ST STA 829+45.32

END T.I.P. PROJECT I-4400C
–L– POT 832+00.00

830

JAI PRABHU, LLC
DB 1233 PG 592
SLD 1419

BGA ASSOCIATES
LIMITED PARTNERSHIP
DB 797 PG 87

DB 5018 PG 535

DONNA A. CONNOLLY, TRUSTEE
OF THE DONNA A. CONNOLLY TRUST

DONNA A. CONNOLLY,
TRUSTEE
OF THE DONNA A.
CONNOLLY TRUST

CHARLES P. SHOOK
DB 1251 PG 233

SHIV SHAKTI
ENTERPRISES, LLC
DB 1492 PG 90

I-4700
CONSTRUCTION
BY OTHERS

RETENTION POND

PROP. WW FENCE
2' SPEC. LAT. BASE DITCH SEE DETAIL R EST. 145 CY DDE
TIE 2' SPEC. LAT. BASE DITCHES INTO EXISTING SWALE
2' LAT. BASE DITCH SEE DETAIL GG
300' LANE TAPER
PROP. GUARDRAIL
PROP. SHOULDER BERM GUTTER
DO NOT DISTURB SHED
+56.14 –L– 170.00' LT
+31.94 –L– 135.00' LT
END WW FENCE +00.135' LT
2' SPEC. LAT. BASE DITCH SEE DETAIL B EST. 20 TONS EST. 30 SYGE EST. 16 CY DDE
TIE UPSTREAM END OF 2' SPEC. LAT. BASE DITCH INTO I-4700 DITCH
+00.00 –L– 134.98' LT
SINGLE SLOPE CONC. BARRIER
36" RCP-IV
2GI-A FG
2GI-B FG
42' TYP.
OTCB-4
GREU TL-3
15" RCP-V
CLASS 'B' RIPRAP EST. 2 TONS EST. 7 SYGF
SPEC. LAT. 'V' DITCH SEE DETAIL FF
SPEC. LAT. V DITCH SEE DETAIL EE
BEGIN SHOULDER BERM GUTTER STA. +10.00 –L–
TIE PROP. SPEC. LAT. 'V' DITCH INTO I-4700 DITCH
END WW FENCE +00, 135' RT
PROP. SHOULDER BERM GUTTER
PROP. GUARDRAIL
RETAIN
FDPS
SHOULDER DRAIN OUTLET
8:1
N 30° 13' 04.4" W
N 29° 27' 31.3" W
–RPA–
–RPB–
–BL– 1

FOR CURVE DATA, SEE SHEET 2B–2
FOR DITCH DETAIL, SEE SHEETS 2D–1, 2D–2
FOR –L– PROFILE, SEE SHEET 35

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Raleigh, North Carolina 27609
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
I-4400C	18
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 046784 ENGINEER MARC A. WHITMORE

DocuSigned by: Marc Whitmore 7/10/2019

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047948 ENGINEER JOHN M. BLANCETT

DocuSigned by: John Blancett 7/11/2019

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ID	TYPE
1802	CB – E
1803	JB W/MH
1805	2GI-A SG
1806	CB – G
1810	BLIND JB
1813	CB – G
1812	TB JB W/MH
1816	TB JB W/MH
1817	CB – G
1819	CB – G
1818	2GI-B SG
1825	CB – G
1828	CB – G
1827	TBDI

NAD 83/NA 2011

315 320

S 33°31'36" E 167.99'
N 38°36'45" W 149.73'
N 43°56'01" W 186.43'
N 30°54'30" W 127.67'
S 30°54'37" E 50.91'
N 47°03'36" E 181.23'
N 55°40'29" E 81.92'
N 24°10'27" W 131.02'
S 55°40'32" W 123.67'
S 55°55'16" W 205.03'
N 47°03'36" E 188.30' (DB 594 PG 909 EXCEPTION 3)

TROY LEE ALVERSON
DB 673 PG 805

TROY L. ALVERSON, JR., TRUSTEE
THE ALVERSON FAMILY TRUST
DB 1036 PG 190

TROY L. ALVERSON, JR.
DB 652 PG 505
DB 755 PG 121

VISTA VENTURES LLC
DB 1641 PG 565

MCDONALD'S REAL ESTATE COMPANY
DB 1504 PG 33

VANN PROPERTIES, LLC
DB 1474 PG 170

NC HWY COMM.
DB 554 PG 325
(EXCEPTION 2)

WILLIAM RHETT TABER, III
ANDREW PATTON TABER
DB 1205 PG 131

RONNIE P. GRAY
DB 1253 PG 45

-Y10- PT STA. 316+44.14
-Y10- PC STA. 316+68.99
-Y10- PC STA. 312+65.83
-Y10- PT STA. 319+79.36
-Y10- PC STA. 321+15.33
-Y10- STA 324+00.00

BEGIN MILL & OVERLAY
-Y10- STA. 314+95.00

BEGIN C&G
+95.98 -Y10-
108.32' RT

270' TAPER

N 34° 58' 55.2" W
N 37° 43' 04" W
N 52° 13' 27.6" W

-EY2-A
-EY2-
-EY3-
-BY2- 22
-BY3- 29
-Y10-

+35.00 -Y10- 70.00' LT
+10.00 -Y10- 70.00' LT
+85.00 -Y10- 51.28' LT
+35.00 -Y10- 51.31' LT
+84.45 -Y10- 69.91' RT
+78.55 -Y10- 89.43' RT
+02.25 -Y10- 78.61' RT
+97.49 -Y10- 95.04' RT
+70.31 -Y10- 82.70' RT
+93.64 -Y10- 83.48' RT
+71.06 -Y10- 55.00' RT 10.0' R
+78.00 -Y10- 68.17' RT
+66.75 -Y10- 88.19' RT
+83.21 -Y10- 99.29' RT
+85.88 -Y10- 82.92' RT
+31.44 -Y10- 44.75' RT
+45.00 -Y10- 105.00' RT
+95.00 -Y10- 100.00' RT
+05.00 -Y10- 67.00' RT
+30.16 -Y10- 72.24' RT
+29.66 -Y10- 63.76' RT
+83.97 -Y10- 80.57' RT
+54.20
+73.70
+25.00
-15.20

TIE TO EXIST. +20.00, 0.20' RT -Y10-
TIE TO EXIST. +20.00, 9.25' RT -Y10-
PROP. MONOLITHIC MEDIAN
PLUG AND FLOWABLE FILL
REMOVE 10' OF EX 15" RCP
REMOVE MH
REMOVE
FLOWABLE FILL
CONSTRUCT DRIVEWAY PER RIGHT-OF-WAY AGREEMENT
2'-0" CONC. VALLEY GUTTER
BEGIN +77.06, 45.00' RT -Y10-
END +19.83, 44.64' RT -Y10-
MATCHLINE SHEET 5
-Y10- STA 324+00.00

15" RCP-IV
18" RCP-IV
24" RCP-IV
30" RCP-IV
15" RCP-V
18 RCP-IV
RETAIN
PUE
270' TAPER

FOR CURVE DATA, SEE SHEET 2B-2
FOR DITCH DETAIL, SEE SHEETS 2D-1, 2D-2
FOR -Y10- PROFILE, SEE SHEET 36
FOR -Y10- INTERSECTION DETAIL,
SEE SHEET 2B-5 & 2B-6

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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-4400C	19
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 046784 ENGINEER MARC A. WHITMORE
DocuSigned by: Marc Whitmore 7/10/2019

HYDRAULICS ENGINEER
NORTH CAROLINA PROFESSIONAL SEAL 047948 ENGINEER JOHN M BLANCETT
DocuSigned by: John Blancett /11/2019

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REVISIONS

7/19/2017

MATCHLINE SHEET 6 –Y10– STA 338+00.00

–Y10– STA 338+42.99 20.75' LT

–Y10– STA 338+42.99 20.75' RT

–Y10– STA 338+42.99

–Y10– STA 339+44.83

–Y10– STA 340+03.53

–Y10– TS STA 340+67.08

–Y10– STA 341+98.24

–Y10– SC STA 344+42.08

–Y10– CS STA 348+31.23

–Y10– PT STA 349+44.83

–Y17– PT STA 13+28.69

–Y17– PC STA 10+98.80

–Y17– POT STA 10+00.00

–Y17– STA 13+46.41

–Y17– STA 14+42.99

–Y10– STA 338+42.99

–Y10– STA 338+44.29

–Y10– STA 339+05.91

–Y10– STA 339+20.75

–Y10– STA 339+44.83

–Y10– STA 340+03.53

–Y10– STA 340+67.08

–Y10– STA 341+98.24

–Y10– STA 344+42.08

–Y10– STA 348+31.23

–Y10– STA 349+44.83

N 10°06'44" W 1100.58'

S 79°05'16" W 355.05'

N 10°06'44" W 44.83'

S 62°30'04" E 154.83'

S 62°30'04" E 154.46'

S 62°30'04" E 154.47'

S 62°30'04" E 154.47'

N 80°16'25" E 164.47'

S 38°38'11" E 215.05'

S 20°28'44" E 180.05'

S 80°16'44" W 100.01'

S 80°16'44" W 271.29'

N 25°17'28" E 100.00'

N 25°17'28" E 100.00'

N 53°09'13" E 181.50'

N 25°23'23" W 10.56'

N 69°48'44" E 95.48'

N 22°22'29" E 399.68'

CHD = N 46°53'42" W
DIST = 30.72'
ARC = 30.82'
R = 48.00'

CHD = N 65°23'16" W
DIST = 38.06'
ARC = 38.26'
R = 48.00'

HARDEE'S RESTAURANTS, LLC
DB 1529 PG 645

(39) WAFFLE HOUSE, INC.
DB 1584 PG 87

(34) SHJ RENTALS, LLC
DB 3150 PG 410

EDWARD H. OWENBEY
DB 625 PG 913

ADMIRAL D. WILLIAMS, TRUSTEE
THE WILLIAMS FAMILY TRUST
DB 1472 PG 240

(35) RAMER PROPERTIES, LLC
DB 1212 PG 713

(13) DISCOVERY ONE AND HOLDING, LLC
DB 3166 PG 604

(36) STUART I. RUBIN, TRUSTEE
DB 1155 PG 380

(32) NICOLS ENTERPRISES, LLC
DB 1404 PG 657

(33) LILLIE HAZEL MOSS
DB 744 PG 701

DANIEL J. WARNE
DB 1352 PG 390

FLOYD S. GREEN
DB 537 PG 233

KATHY B. AILSTOCK
DB 746 PG 553

BRIAN DWAYNE HEATON
DB 1504 PG 119

(40) DISCOVERY ONE LAND HOLDING, LLC
DB 3166 PG 604

XCEL SPORTSPLEX, LLC
DB 1455 PG 576

ASHEVILLE HIGHWAY PROPERTIES, LLC
DB 1410 PG 525

PROP. GUARDRAIL
REMOVE 8' OF EX 24" RCP
REMOVE 4' OF EX 12" RCP
REMOVE 5' OF EX 15" RCP
REMOVE 15" RCP-IV
REMOVE 24" RCP-IV
REMOVE 30" RCP-IV
REMOVE 36" RCP-IV
REMOVE DI
REMOVE CB
REMOVE 10' OF EX 18" RCP
15" RCP-IV
18" RCP-IV
24" RCP-IV
30" RCP-IV
36" RCP-IV
PLUG AND FLOWABLE FILL
PROP. MONOLITHIC MEDIAN
100' LANE TAPER
175' LANE TAPER
140' TAPER
75' TYP.
200' LANE TAPERS
BEGIN MILL & OVERLAY STA. 344+60.00 –Y10–
END MILL & OVERLAY STA. 348+25.00 –Y10–
DO NOT DISTURB MEDIAN ISLAND
TIE TO EXIST. C&G STA. +60.00 –Y10–
TIE TO EXIST. C&G STA. +25.00 –Y10–
END WW FENCE –Y10– +10, 110' RT
BEGIN WW FENCE –Y10– +10, 76.75' RT
END CONSTRUCTION –Y17– STA. 10+90.00
RETAIN
CB – E
CB – F
CB – G
DI
JB W/MH
TB2GI–A FG
TB2GI–B FG
2GI–A SG
2GI–B SG
BLIND JB
PIPE COLLAR

+06.35 –Y10– 74.64' LT
+14.23 –Y10– 133.60' LT
+35.42 –Y10– 131.67' LT
+26.62 –Y10– 73.89' LT
+00.00 –Y10– 54.22' LT
+83.65 –Y10– 150.00' LT
+80.00 –Y10– 32.75' LT, 62.0' R
+55.62 –Y10– 73.24' LT
+51.00 –Y10– 44.00' LT, 8.0' R
+50.00 –Y10– 7.00' LT, 1.0' R
+50.00 –Y10– 7.00' LT, 1.0' R
+50.00 –Y10– 50.00' LT
+17.00 –Y10– 78.21' RT
+85.00
+36.31 –Y17– 116.95' RT
+25.65 –Y17– 63.00' LT
+54.00 –Y17– 41.58' RT
+50.00 –Y17– 45.50' RT
+24.66 –Y17– 29.39' RT
+98.80 –Y17– 9.32' RT
+90.00 –Y17– 40.00' LT 23.79' LT
+98.80 –Y17– 9.44' LT
+19.45
+00.00
+75.00

ID	TYPE
1901	CB – G
1906	CB – G
1912	CB – G
1919	PIPE COLLAR
1920	TB2GI–A FG
1927	CB – F
1914	PIPE COLLAR
1921	TB2GI–B FG
1922	TB2GI–B FG
1916	TB2GI–B FG
1952	PIPE COLLAR
1929	2GI–B FG
1934	JB W/MH
1933	CB – F
1950	BLIND JB
1903	CB – F
1907	CB – E

ID	TYPE
1904	BLIND JB
1905	2GI–A SG
1924	2GI–A SG
1911	2GI–A SG
1910	2GI–A SG
1915	CB – E
1917	2GI–B SG
1951	JB W/MH
1926	CB – G
1925	TB2GI–B FG
1953	TB2GI–B FG
1930	TB2GI–B FG
1954	CB – G
1932	2GI–A SG
1939	2GI–A SG
1931	JB W/MH

FOR CURVE DATA, SEE SHEET 2B–2
FOR DITCH DETAIL, SEE SHEETS 2D–1, 2D–2
FOR –Y10– PROFILE, SEE SHEET 36 & 37
FOR –Y17– PROFILE, SEE SHEET 48
FOR –Y10– INTERSECTION DETAIL, SEE SHEET 2B–8

NAD 83/NA 2011

I-4400C 2019 1922
I-4400C 2019 1924 S19
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8/22/2017

REVISIONS

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		I-4400C	20
		R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 046784 ENGINEER MARC A. WHITMORE

DocuSigned by: Marc Whitmore 7/10/2019

HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047948 ENGINEER JOHN M. BLANCETT

DocuSigned by: John Blancett 7/11/2019

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NAD 83/NA 2011

MATCHLINE SHEET 8
–Y11– STA 19+50.00

JAMES E. HANNEN
DB 1479 PG 469

CANANG, LLC
DB 1037 PG 349

KING AUCTION AND REALTY COMPANY, INC.
DB 667 PG 387

FLETCHER JOINT VENTURE, INC.
DB 958 PG 154

CMH HOMES, INC.
DB 842 PG 625

ASHEVILLE HIGHWAY PROPERTIES, LLC
DB 1410 PG 525

HENDERSONVILLE RD
US 25

RETAIN

TIE TO EXIST. C&G

END CONSTRUCTION
–Y11– STA. 23+13.47

PROP. GUARDRAIL

24" RCP–IV

18" RCP–IV

CB–G

CB–F

GREU TL–2

2GI–A SG

REMOVE 22' OF EX 15" RCP

120' LANE TAPER

+80.00 –Y11– 38.00' RT

N 61° 37' 00.8" E

–BY5– 42

–BY5– 43

–EY5–

–Y11–

EXIST

CAT–I

FOR CURVE DATA, SEE SHEET 2B–2
FOR DITCH DETAIL, SEE SHEETS 2D–1, 2D–2
FOR –Y11– PROFILE, SEE SHEET 45
FOR –Y11– INTERSECTION DETAIL, SEE SHEET 2B–10

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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-4400C	21
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 046784 ENGINEER MARC A. WHITMORE

DocuSigned by: Marc Whitmore 7/10/2019
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HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047948 ENGINEER JOHN M. BLANCETT

DocuSigned by: John Blancett /11/2019
...

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

8/22/2017

REVISIONS

10-JUL-2018 10:52
I-4400C_RDY_1951_S21
HNTB

NAD 83 NA 2011

MATCHLINE SHEET 15
–Y12– STA 21+40.00

–Y12– POT STA 10+00.00
–Y12– PC STA 11+10.61
–Y12– PT STA 13+26.67
–Y12– PC STA 16+00.00
–Y12– PRC STA 19+94.16

MINKLES, LLC
DB 2798 PG 490

STATE OF NORTH CAROLINA
DB 917 PG 605

–EY7– N 89°07'48" E
–EY7– N 73° 38' 46.0" E

–BY7– 46
–BY7– 47
–BY7– 48

–Y12–
+30.00 –Y12– 50.00 LT
+00.00 –Y12– 30.00 LT
+00.00 –Y12– 60.00 LT
+50.00 –Y12– 100.00 LT
+37.49 –Y12– 80.00 LT
+15.00
BEGIN CONSTRUCTION –Y12– STA. 16+00.00
BEGIN 2'-6" C&G +35.00 –Y12– –BY7– 48

GREU TL-2
PROP. GUARDRAIL
TEMP. SHORING
21' TYP
32'
24'
EXIST
FDPS
RETAIN
WATER VAULT
TEST STATION
BM #36
JB

NOTE:
TEMPORARY SHORING SHOWN FOR INFORMATION ONLY. FOR MORE INFORMATION SEE TMP SHEETS.

FOR CURVE DATA, SEE SHEET 2B–2
FOR DITCH DETAIL, SEE SHEETS 2D–1, 2D–2
FOR –Y12– PROFILE, SEE SHEET 45

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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-4400C	22
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 046784 ENGINEER MARC A. WHITMORE

DocuSigned by: Marc Whitmore 7/10/2019
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HYDRAULICS ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 047948 ENGINEER JOHN M. BLANCETT

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NAD 83NA 2011

8/22/2017

REVISIONS

MATCHLINE SHEET 15
–Y12– STA 25+25.00

MATCHLINE SHEET 30
–Y12– PT STA. 29+25.87

MATCHLINE SHEET 30
–Y12– POT STA. 31+73.92

ELIZABETH L. DRIVER
DB 1400 PG 351

ELIZABETH L. DRIVER
DB 4702 PG 1390

CARROL E. BUCKNER
DB 1485 PG 533

CARROL E. BUCKNER
DB 702 PG 833

ADAMS CG, INC.
DB 4800 PG 739

MMJ INVESTMENTS LLC
DB 4401PG 1291

DON SIDES
DB 1265 PG 124

AMERICAN EAGLE FINVESTMENTS, LLC
DB 3509 PG 713

PATRICIA R. MYERS
DB 1100 PG 741

ANTHONY K. ARUFFO
DB 1031PG 658

ROBERT J. REUTHER
DB 1229 PG 779

ERNEST W. ORR
DB 925 PG 544

MARK A. WATTS
DB 1266 PG 337

BOILING SPRINGS BAPTIST CHURCH
DB 1198 PG 65

PATRICIA W. MEDLOCK
DB 1149 PG 393

BYRON M. TERRELL
DB 1114 PG 3

JIMMY E. ALEXANDER
DB 714 PG 390

PINEY DRIVE

NORMAN ROAD

WILLOWOOD CIRCLE

–Y20– POT STA. 16+32.29

–Y20– PC STA. 13+28.83

–Y20– PT STA. 12+78.70

–Y20– PC STA. 10+76.95

–Y12– STA. 25+99.87 = –Y20– POT STA. 10+00.00

–Y12– PRC STA. 25+68.09

–Y12– STA. 25+25.00

–Y12– STA. 29+30.00

–Y12– POT STA. 31+73.92

–BY7– 51

–BY7– 50

BM #39

BM #38

N 11° 17' 49.9" E

N 9° 42' 50.5" E

S 85°30'39" E 38.89'

S 85°30'39" E 129.60'

N 04°40'04" E 147.68'

N 04°20'52" E 137.62'

N 04°52'42" E 139.47'

N 03°19'24" E 280.39'

S 86°30'28" E 7.76'

S 85°24'31" E 89.46'

S 85°35'50" E 134.44'

S 85°38'32" E 134.94'

S 85°38'32" E 135.00'

S 85°38'32" E 135.41'

S 85°38'32" E 134.54'

S 87° 34' 02.9" E

S 04°31'03" W 95.69'

S 04°31'03" W 83.51'

S 04°31'03" W 16.18'

N 04°48'10" E 140.23'

N 04°48'55" E 99.94'

S 04°31'49" W 16.57'

S 04°31'49" W 16.82'

END CONSTRUCTION –Y20– STA. 11+50.00

END RETAINING WALL –RW107– –Y12– STA. 28+60.00, 22.50' LT

RETAINING WALL –RW107–

BEGIN RETAINING WALL –RW107– –Y12– STA. 26+80.00, 22.50' LT

TIE TO EXIST. GUARDRAIL

PROP. GUARDRAIL

TEMP. SHORING

END CONSTRUCTION –Y12– STA. 29+30.00

RETAIN

PUE

AUE

21' TYP.

+56.53 –Y12– 88.50' LT

+12.82 –Y20– 52.24' LT

+96.35 –Y20– 62.00' LT

+00.96 –Y20– 30.00' LT

+90.39 –Y20– 51.02' LT

+10.09

+07.26 –Y12– 61.37' RT

+30.67 –Y12– 70.79' RT

+06.19 –Y12– 97.78' RT

+01.35 –Y12– 75.16' RT

+34.98 –Y12– 91.50' RT

+07.25 –Y12– 76.54' RT

046072

NOTE:
TEMPORARY SHORING SHOWN FOR INFORMATION ONLY. FOR MORE INFORMATION SEE TMP SHEETS.

FOR CURVE DATA, SEE SHEET 2B–2
FOR DITCH DETAIL, SEE SHEETS 2D–1, 2D–2
FOR –Y12– PROFILE, SEE SHEET 45
FOR –Y20– PROFILE, SEE SHEET 46

10-JUL-2019 10:22
I4400C_RDY_PSH_S22
HNTB

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	I-4400C	Y-5

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

2100
2090
2080
2070

-MATCHLINE-
10:1
0.040 0.020 0.020 0.040
2092.66
2091.85
2078.68
2:1
EX. C/A
12:1
2:1
2:1
2067.52
PROP. C/A

18+00.0000

-MATCHLINE-
11:1
0.040 0.020 0.020 0.040
2091.76
2090.95
2079.45
2:1
EX. C/A
12:1
2:1
2:1
2066.03
PROP. C/A

17+50.0000

-MATCHLINE-
12:1
0.040 0.020 0.020 0.040
2091.01
2090.20
2080.46
2:1
EX. C/A
12:1
2:1
2:1
2064.55
PROP. C/A

17+00.0000

-YIORPA-

21-MAY-2019 15:31
\Roadway\Corridor Modeling\I4400C_RDY_XPL_Y10RPA.dgn
HNB

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	I-4400C	X-50

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

2100 2090 2110

EX. C/A

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

2087.03 2087.34 2087.65 2088.28 2087.96

0.040 0.020 0.020 0.040 0.040 0.020 0.020 0.040

2099.77 2100.82 2099.82 2099.82 2100.82 2099.77

2098.28 2098.28

719 + 00.00

2100.19 2101.24 2100.24 2100.24 2101.24 2100.19

2098.45 2098.45

718 + 50.00

2100.61 2101.66 2100.66 2100.66 2101.66 2100.61

2099.01 2099.01

718 + 00.00

2101.03 2102.08 2101.08 2101.08 2102.08 2101.03

2099.44 2099.44

717 + 50.00

2101.45 2102.50 2101.50 2101.50 2102.50 2101.45

2099.94 2099.94

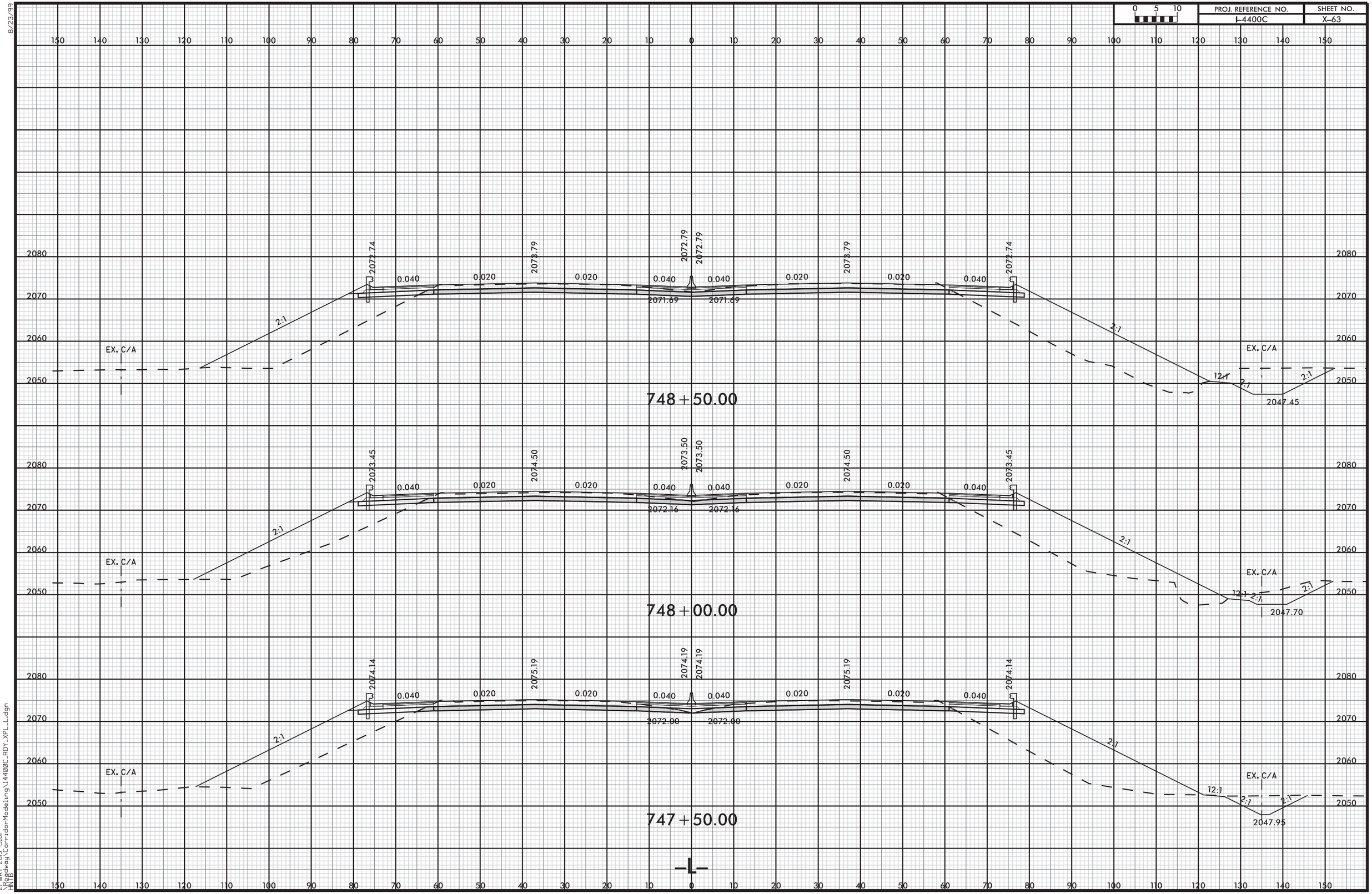
717 + 00.00

-L-

21-MAY-2019 14:54
\Roadway\CorridorModeling\I4400C_RDY_XPL_L.dgn
HNTB

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	L-4400C	X-63



21-MAY-2019 15:01
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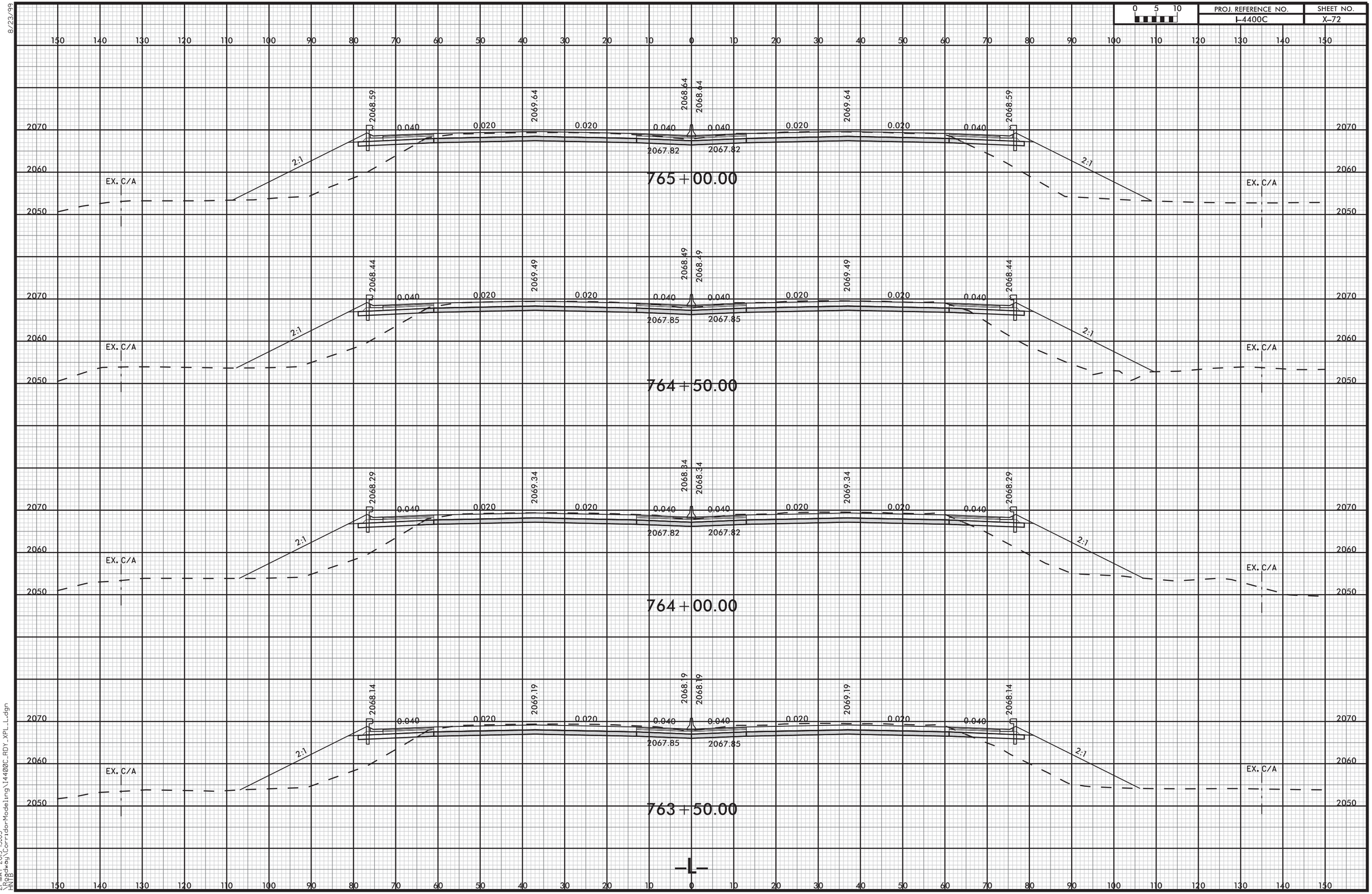
MNB

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	I-4400C	X-72



21-MAY-2019 15:05
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HNB

8/23/99

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	I-4400C	X-74

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

2080
2070
2060
2050

2070.38 0.040 0.011 2070.69 0.020 2069.69 0.040 2067.52 2070.44 0.040 2067.52 0.011 2070.69 0.020 2069.64 0.040

2:1 EX. C/A 2:1 EX. C/A

768+50.00

2069.95 0.040 0.001 2070.54 0.020 2069.54 0.040 2067.44 2070.00 0.040 2067.44 0.001 2070.54 0.020 2069.49 0.040

2:1 EX. C/A 2:1 EX. C/A

768+00.00

2069.5 0.040 0.013 2070.39 0.020 2069.39 0.040 2067.23 2069.57 0.040 2067.23 0.013 2070.39 0.020 2069.34 0.040

2:1 EX. C/A 2:1 EX. C/A

767+50.00

—L—

21-MAY-2019 15:06
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HNB