North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.07; Released October 2016)

General Project Information

WBS Element:	45573.1.1	**TIP Number:**	B-5618	**Project Type:** Bridge Replacement	**Date:** 7/7/2017
NCDOT Contact:	Robert T. Turnbull, Environmental Services, Inc.	**Contractor / Designer:**	HNTB North Carolina, P.C. / James A. Byrd, PE		
Address:	4901 Trademark Dr. Raleigh, NC 27610	**Address:**	343 E. Six Forks Road Suite 200 Raleigh, NC 27609		
Phone:	(919) 212-1760	**Phone:**	(919) 424-0437		
Email:	rturnbull@esinc.cc	**Email:**	jabyrd@hntb.com		
City/Town:	Aurora	**County(ies):**	Beaufort		
River Basin(s):	Tar-Pamlico	**CAMA County?**	Yes		
Wetlands within Project Limits?	Yes				

Project Description

Project Length (lin. miles or feet):	0.10	**Surrounding Land Use:**	Rural Residential and Agriculture

	Proposed Project	**Existing Site**
Project Built-Upon Area (ac.)	0.4 ac.	0.3 ac.
Typical Cross Section Description:	2 - 11' asphalt paved lanes with 2' paved shoulders, 4' grass shoulders. Impacted ditch in northwest, southwest, and southeast quadrants are replaced with 3:1 front and back slopes and tie to existing ditch prior to Durham Creek. Impacted ditch in southwest quadrant is replaced with typical ditch with 4:1 front slope and 3:1 back slope.	2 - 10' asphalt paved lanes with grass shoulders, 1:1 of flater grass lined ditches in northwest, southwest and southeast quadrants. Wetlands are present in southeast and northeast quadrants.
Annual Avg Daily Traffic (veh/hr/day):	Design/Future: 480 Year: 2032	Existing: 240 Year: 2012

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

State project B-5618 involves the replacement of Beaufort County Bridge #060315 on SR 1973 (Main Street) over Durham Creek. The existing bridge consists of 1 @ 19' - 0", 1 @ 16' - 3", 1 @ 18' - 8", 1 @ 16'- 1", 1 @ 17' - 0", 1 @ 17'- 7", 1 @ 17' - 5" and 1 @ 18' - 7" timber floor on continuous I-beams. It is to be replaced with a 1 @ 45' - 0", 1 @ 50' - 0" and 1 @ 45' - 0", 21" cored slab (140' total length, 33' totoal width) at the same location.

In accorance with Tar-Pamlico River Buffer Regulations, the propsoed bridge does not contain deck drains. All stormwater from the bridge and approches will be collected by a storm drainage system and discharged into the wetlands. The drainage system will outlet outside of the buffer limits in the northeast quadrant at -L- station 15+84 LT with the outlet pipe set at 0.3% to reduce velocity into the wetlands.

Waterbody Information

Surface Water Body (1):	Durham Creek	**NCDWR Stream Index No.:**	29-21-(1)
NCDWR Surface Water Classification for Water Body	**Primary Classification:**	Class C	
	Supplemental Classification:	Nutrient Sensitive Waters (NSW)	
Other Stream Classification:			
Impairments:			
Aquatic T&E Species?		Comments:	
NRTR Stream ID:		**Buffer Rules in Effect:**	Tar-Pamlico

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

North Carolina Department of Transportation

Highway Stormwater Program

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FOR NCDOT PROJECTS

(Version 2.07; Released October 2016)

WBS Element: 45573.1.1 **TIP No.:** B-5618 **County(ies):** Beaufort

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	13+50 LT 35.323850 / -76.874062	(1)Durham Creek	0.0	3.0	3.0	1.1	110	800	10.78%	2.0	2.6	2.7	2.8	No	No
4	13+50 RT 35.323778 / -76.874113	(1)Durham Creek	0.0	4.0	3.0	0.3	30	320	2.12%	0.6	1.5	0.8	1.6	No	No
4	16+07 RT 35.323546 / -76.873611	(1)Durham Creek	0.0	3.0	3.0	0.1	12	220	2.80%	0.2	1.2	0.2	1.3	No	No

Additional Comments

North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.07; Released October 2016)

WBS Element: **TIP No.:** B-5618 **County(ies):** Beaufort

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	-L- Sta. 15+82 LT 35.323630 / -76.873570	(1)Durham Creek	Riprap Energy Dissipator Basin	Class 'B'	0.2	Pipe	15	0.5	1.3	N/A

Additional Comments

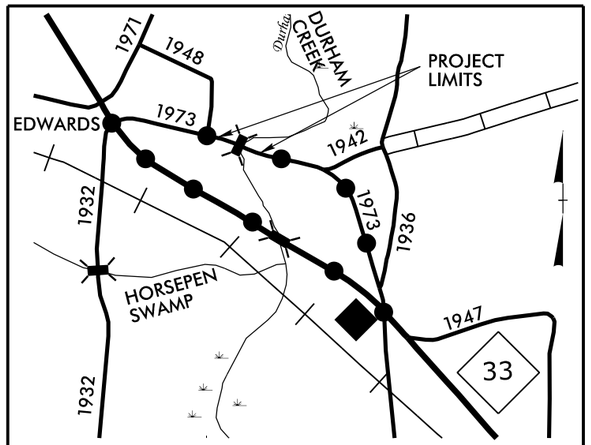
* Refer to the NCDOT Best Management Practices Toolbox (2014), NCDOT Standards, the Federal Highway Administration (FHWA) Hydraulic Engineering Circular No. 14 (HEC-14), Third Edition, Hydraulic Design of Energy Dissipators for Culverts and Channels (July 2006), as applicable, for design guidance and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

09/08/99

TIP PROJECT: B-5618

CONTRACT:

See Sheet 1-A For Index of Sheets



VICINITY MAP

OFFSITE DETOUR

25% SUBMITTAL

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

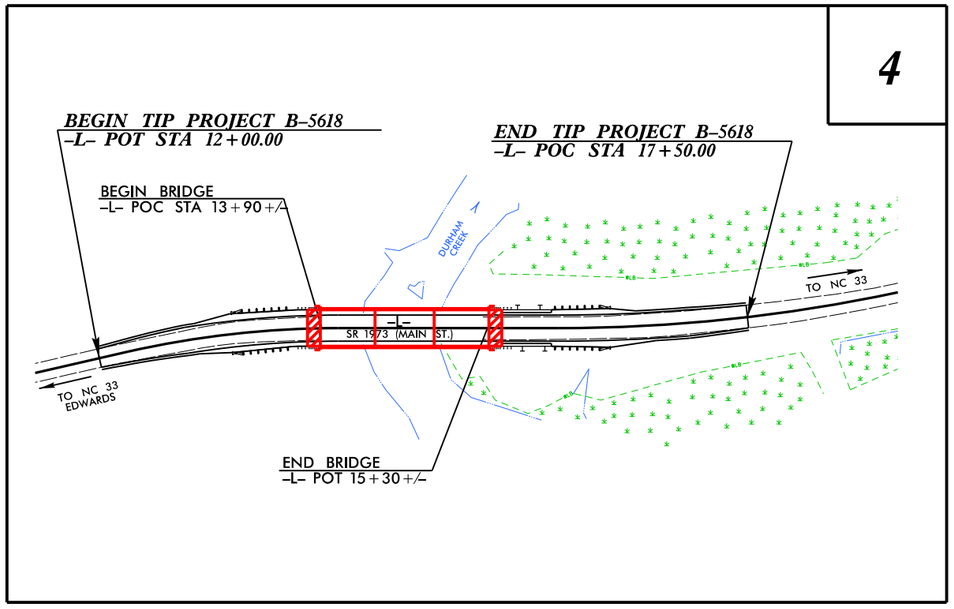
BEAUFORT COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B-5618	1	
STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION	
45573.1.1		PE	

LOCATION: REPLACE BRIDGE NO. 315 OVER DURHAM CREEK ON SR 1973 (MAIN STREET)

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

PERMIT DRAWINGS: BUFFERS

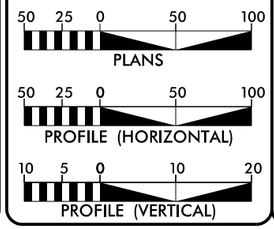


NOTES:

1. CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.
2. THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

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

GRAPHIC SCALES



DESIGN DATA

ADT 2012 = 240
ADT 2032 = 480
K = 10 %
D = 60 %
T = 6 % *
V = 40 MPH
* TTST = 2% DUAL 4%
FUNC CLASS = LOCAL
SUBREGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B-5618 = 0.078 MILES

LENGTH OF STRUCTURE TIP PROJECT B-5618 = 0.026 MILES

TOTAL LENGTH OF TIP PROJECT B-5618 = 0.104 MILES

Prepared In the Office of:

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

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
JANUARY 11, 2017

LETTING DATE:
JULY 19, 2017

DAVID W. BASS, PE
PROJECT ENGINEER

MONICA J. DUVAL
PROJECT DESIGN ENGINEER

HON F. YEUNG, PE
NCDOT CONTACT

HYDRAULICS ENGINEER

SIGNATURE: *P.E.*

ROADWAY DESIGN ENGINEER

SIGNATURE: *P.E.*

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

8/14/2017
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HNTB

8/17/99

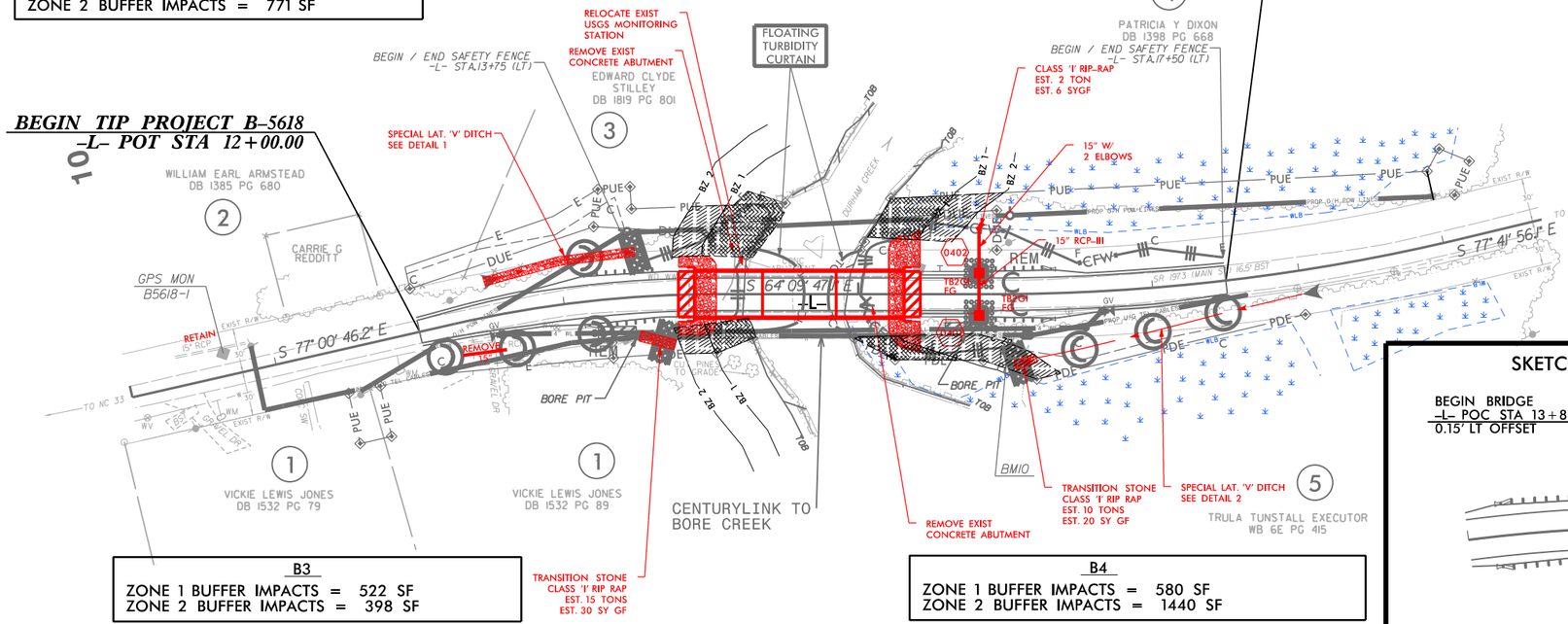
BUFFER IMPACTS

B1
ZONE 1 BUFFER IMPACTS = 1044 SF
ZONE 2 BUFFER IMPACTS = 876 SF

B2
ZONE 1 BUFFER IMPACTS = 1573 SF
ZONE 2 BUFFER IMPACTS = 771 SF

B3
ZONE 1 BUFFER IMPACTS = 522 SF
ZONE 2 BUFFER IMPACTS = 398 SF

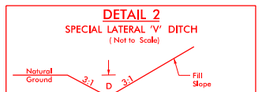
B4
ZONE 1 BUFFER IMPACTS = 580 SF
ZONE 2 BUFFER IMPACTS = 1440 SF



DETAIL 1
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

FROM -L- STA. 12+50 TO STA. 13+50 LT.

DETAIL 2
SPECIAL LATERAL 'V' DITCH
(Not to Scale)

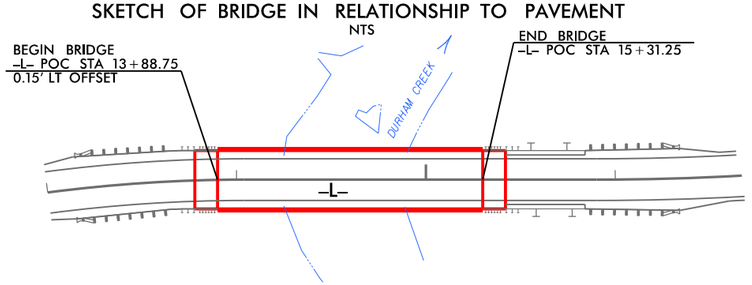


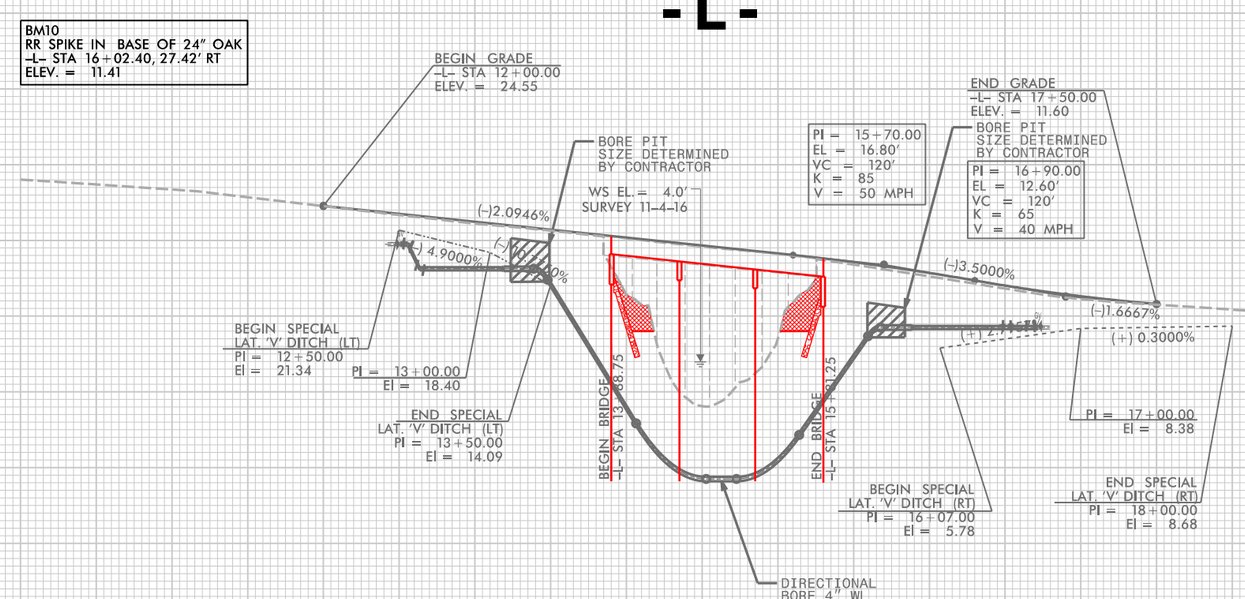
FROM -L- STA. 16+07 TO STA. 18+00 RT.

NAD 83/NA 2011

SKETCH OF BRIDGE IN RELATIONSHIP TO PAVEMENT

NTS





BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 1900	CFS
DESIGN FREQUENCY	= 25	YRS
DESIGN HW ELEVATION	= 8.3	FT
BASE DISCHARGE	= 3490	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 10.7	FT
OVERTOPPING DISCHARGE	= 2730	CFS
OVERTOPPING FREQUENCY	= >50 (+)	YRS
OVERTOPPING ELEVATION	= 10.01	FT
DATE OF SURVEY	= 11-04-16	
W.S.ELEVATION AT DATE OF SURVEY	= 4.0	FT

HNTB NORTH CAROLINA, P.C.
343 E. Six Forks Road, Suite 200
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PROJECT REFERENCE NO.	SHEET NO.
B-5618	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

7/2/2007
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HNTB

09/08/99

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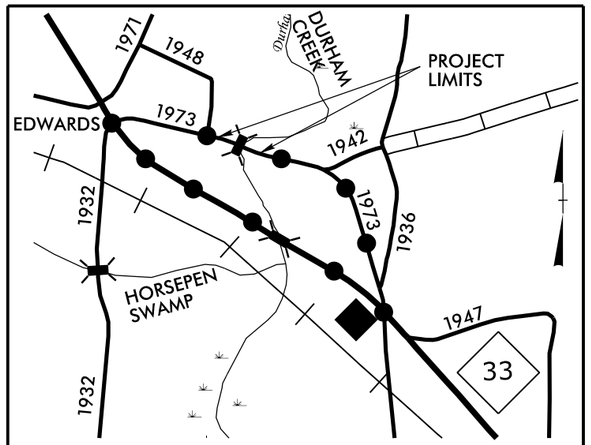
See Sheet 1-A For Index of Sheets



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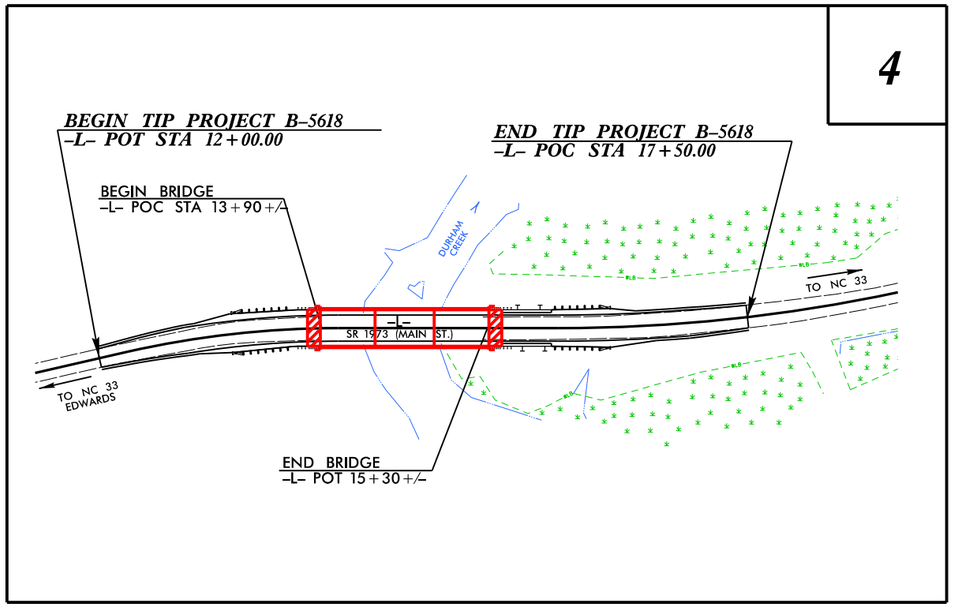

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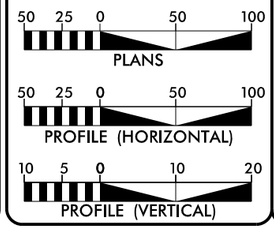

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STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

8/14/2017
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HNTB

8/17/99

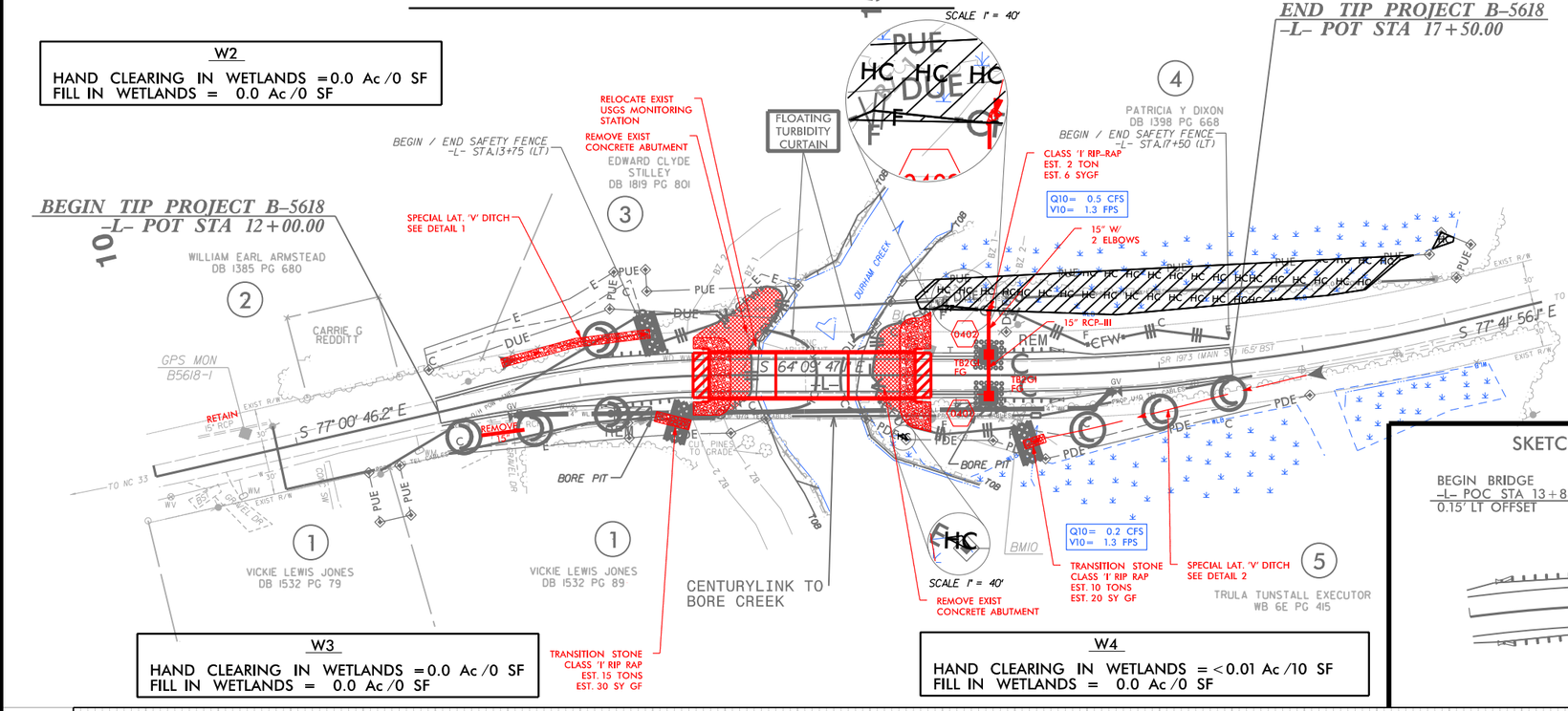
WETLAND & STREAM IMPACTS

W1
HAND CLEARING IN WETLANDS = 0.19 Ac /8354 SF
FILL IN WETLANDS = < 0.01 Ac /50 SF

W2
HAND CLEARING IN WETLANDS = 0.0 Ac /0 SF
FILL IN WETLANDS = 0.0 Ac /0 SF

W3
HAND CLEARING IN WETLANDS = 0.0 Ac /0 SF
FILL IN WETLANDS = 0.0 Ac /0 SF

W4
HAND CLEARING IN WETLANDS = < 0.01 Ac /10 SF
FILL IN WETLANDS = 0.0 Ac /0 SF



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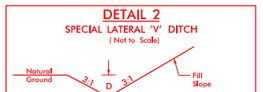

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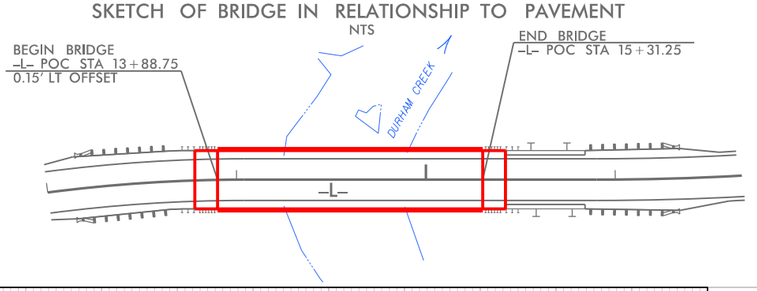

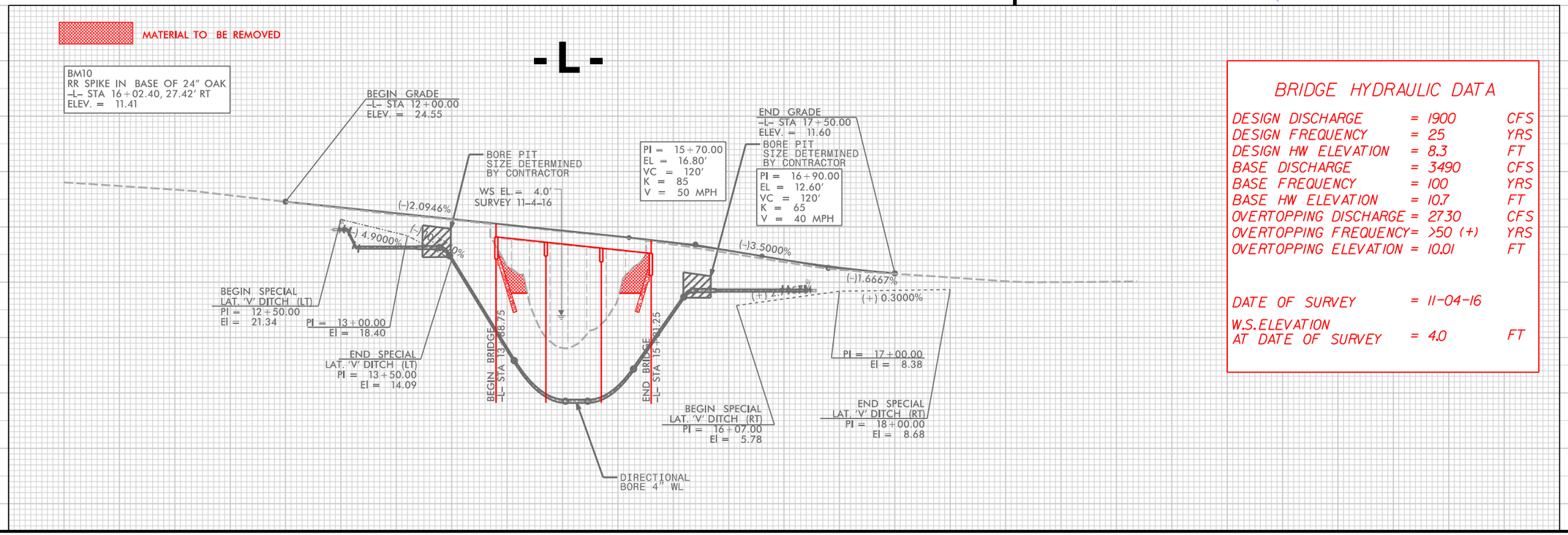

BRIDGE HYDRAULIC DATA

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WETLAND & STREAM IMPACTS

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W3
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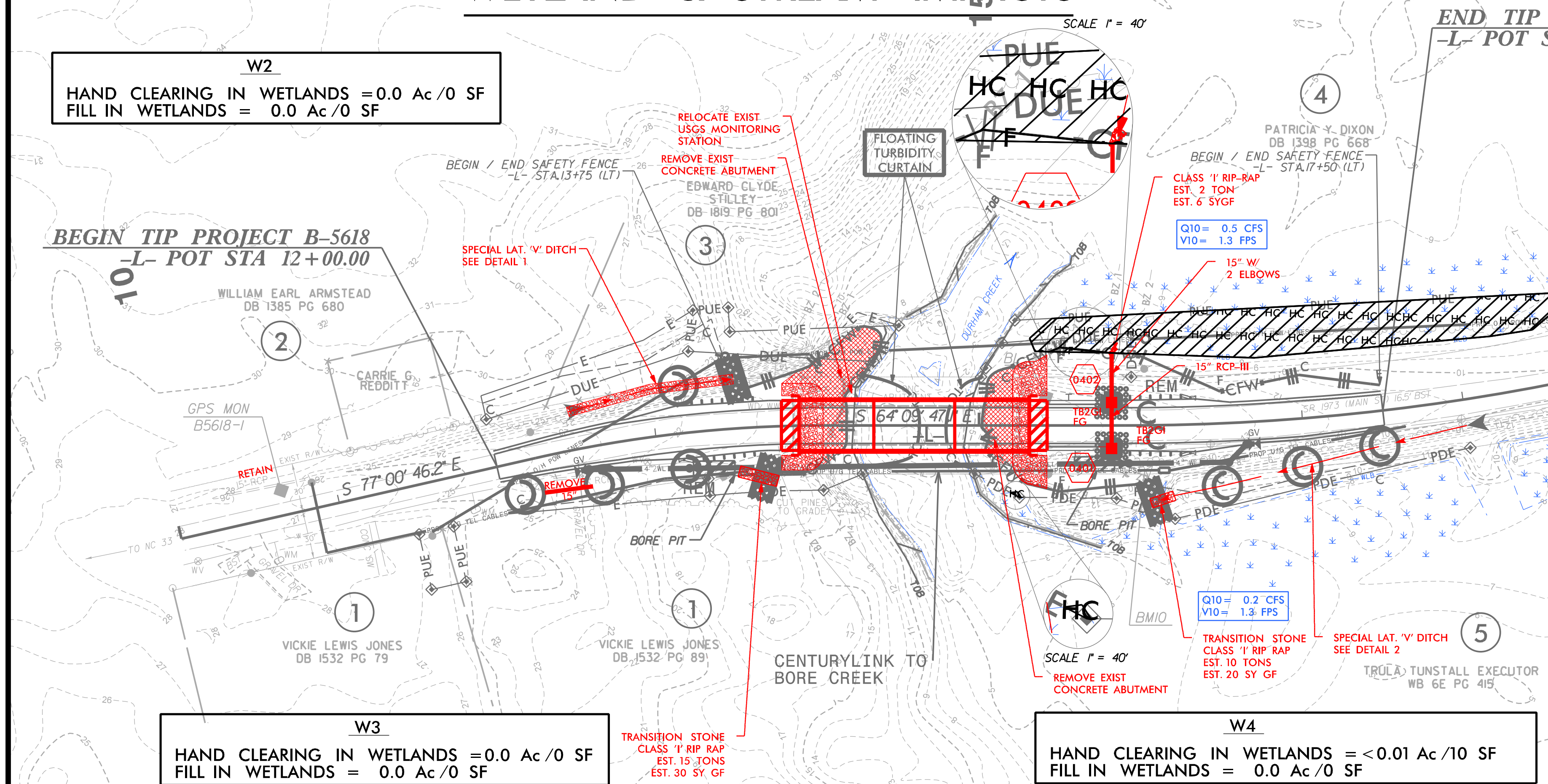
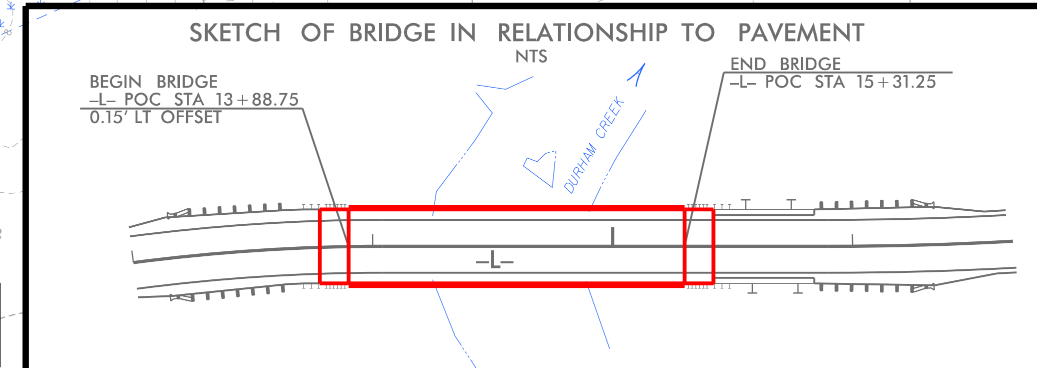
FILL IN WETLANDS = 0.0 Ac / 0 SF

W4
HAND CLEARING IN WETLANDS = <0.01 Ac / 10 SF
FILL IN WETLANDS = 0.0 Ac / 0 SF





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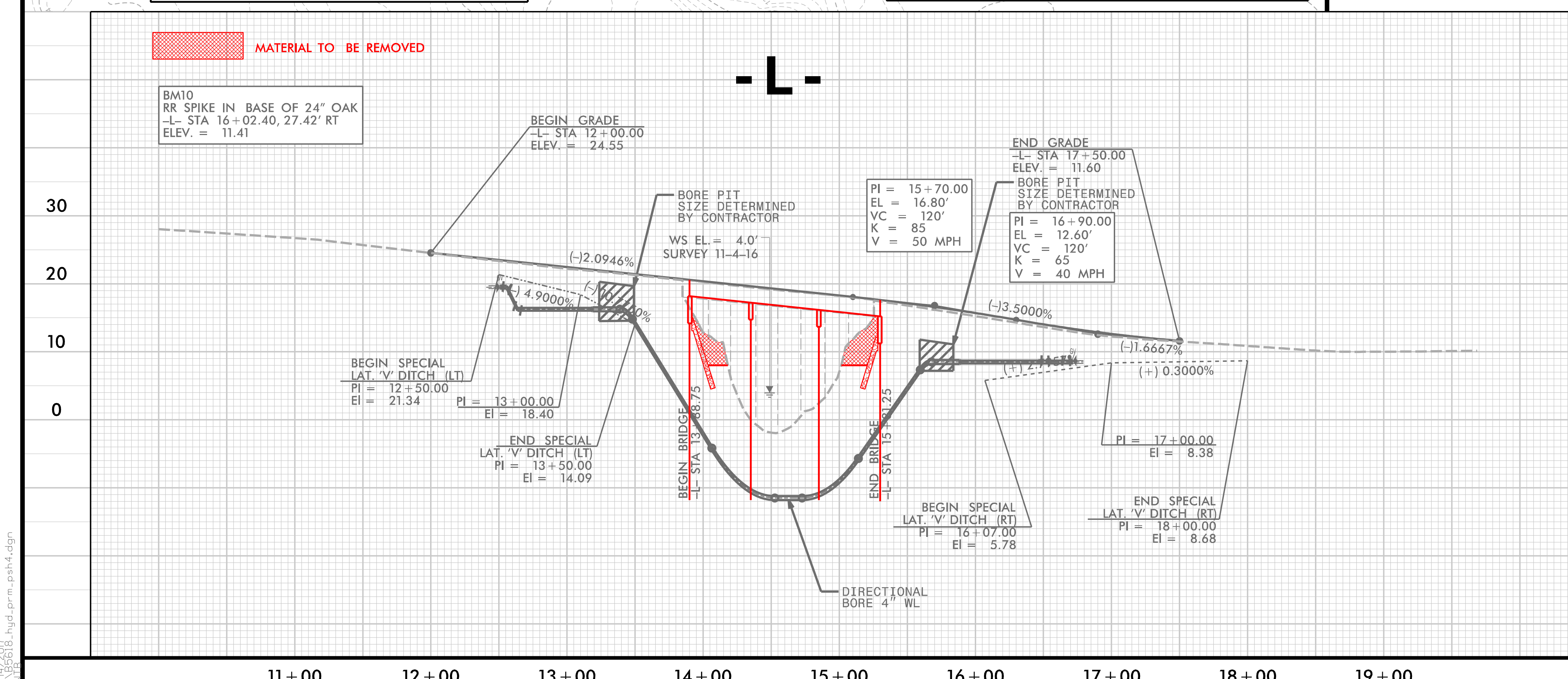

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OVERTOPPING FREQUENCY	= >50 (+)	YRS
OVERTOPPING ELEVATION	= 10.01	FT
DATE OF SURVEY	= 11-04-16	
W.S. ELEVATION AT DATE OF SURVEY	= 4.0	FT

8/17/99

8/14/2017 B5618_hyd_prm_psh4.dgn

-L-

40
30
20
10
0
–10

MIN. PROP. OH POWER APRROX. ELEV. = 35.0′

MIN. PROP. OH CABLE APRROX. ELEV. = 30.0′

PROP. POWER POLE LOCATION

PROP. POWER POLE LOCATION

WS EL. = 4.0′
SURVEY 11–4–16

(–)2.0946%

(–) 4.9000%

(–) 10.7750%

(–)3.5000%

(–)1.6667%

(+) 2.7957%

(+) 0.3000%

BEGIN SPECIAL
LAT. 'V' DITCH (LT)
PI = 12+50.00
EI = 21.34

PI = 13+00.00
EI = 18.40

END SPECIAL
LAT. 'V' DITCH (LT)
PI = 13+50.00
EI = 14.09

BEGIN SPECIAL
LAT. 'V' DITCH (RT)
PI = 16+07.00
EI = 5.78

PI = 17+00.00
EI = 8.38

END SPECIAL
LAT. 'V' DITCH (RT)
PI = 18+00.00
EI = 8.68

B–5618
BEAUFORT COUNTY BRIDGE 315
SR 1973
AERIAL POWER LINE CLEARANCE

SCALE:
1′=10′ (VERTICAL)
1′=50′ (HORIZONTAL)

11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00

WETLAND PERMIT IMPACT SUMMARY

			WETLAND IMPACTS					SURFACE WATER IMPACTS				
Site No.	Station (From/To)	Structure Size / Type	Permanent Fill In Wetlands (ac)	Temp. Fill In Wetlands (ac)	Excavation in Wetlands (ac)	Mechanized Clearing in Wetlands (ac)	Hand Clearing in Wetlands (ac)	Permanent SW impacts (ac)	Temp. SW impacts (ac)	Existing Channel Impacts Permanent (ft)	Existing Channel Impacts Temp. (ft)	Natural Stream Design (ft)
1	-L- STA.15+19 TO STA. 19+20	21" CORED SLAB BRIDGE	<0.01	0.00	0.00	0.00	0.19	0.00	0.00	0	0	0
TOTALS:			<0.01	0.00	0.00	0.00	0.19	0.00	0.00	0	0	0

Notes: Permanent Fill in Wetlands: 50 square feet

Hand Clearing in Wetlands: 8364 square feet

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

BEAUFORT COUNTY BRIDGE NO. 315
B-5618

SHEET OF 7/7/2017

BUFFER IMPACTS SUMMARY

SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	IMPACT									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE				
			ROAD CROSSING	BRIDGE	PARALLEL IMPACT	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)	TOTAL (ft^2)	ZONE 1 (ft^2)	ZONE 2 (ft^2)
1	21" CORED SLAB BRIDGE	-L- 13+74 TO 16+36		X		3719	3485	7204					
TOTAL:						3719	3485	7204	-	-	-		

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

BEAUFORT COUNTY BRIDGE NO. 315
B-5618

7/7/2017
SHEET OF

Rev. May 2006

WETLANDS IN BUFFER IMPACTS SUMMARY

SITE NO.	STATION (FROM/TO)		WETLANDS IN BUFFERS	
			ZONE 1 (ft^2)	ZONE 2 (ft^2)
1	-L- 13+74 TO 16+36		388	644
TOTAL:			388	644

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

BEAUFORT COUNTY BRIDGE NO. 315
B-5618

7/7/2017
SHEET OF

Rev. Jan 2009