North Carolina Department of Transportation

Highway Stormwater Program

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.07; Released October 2016)

WBS Element: 55043.1.1 **TIP No.:** B-5413 **County(ies):** Beaufort

General Project Information

WBS Element:	55043.1.1	**TIP Number:**	B-5413	**Project Type:**	Bridge Replacement
NCDOT Contact:	Robert T. Turnbull, Environmental Services, Inc.	**Contractor / Designer:**	HNTB North Carolina, P.C. / James A. Byrd, PE	**Date:**	9/20/2017
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):	0.15	**Surrounding Land Use:**	Rural Residential and Agriculture

	Proposed Project	Existing Site
Project Built-Upon Area (ac.)	1.2 ac.	0.9 ac.
Typical Cross Section Description:	2 - 11' asphalt paved lanes with 2' paved shoulders, 4' grass shoulders.	2 - 9' asphalt paved lanes with grass shoulders. Wetlands are present in all four quadrants. CAMA wetlands are distinguished from 404 wetlands. Tributaries to Smith Creek are present in the two southern quadrants, and an NC Wildlife boating access area is located in the northeast quadrant.
Annual Avg Daily Traffic (veh/hr/day):	Design/Future: 500 Year: 2033	Existing: 250 Year: 2013

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

State project B-5413 involves the replacement of Beaufort County Bridge #060020 on NC 33 over Smith Creek. The existing bridge consists of 1 @ 25' - 6", 2 @ 25' - 0", and 1 @ 25' - 6" reinforced concrete floor on continuous I-beams, reinforced concrete caps, and timber piles. It is to be replaced with a 1 @ 50' - 0" and 1 @ 65' - 0" 24" cored slab (115' total length, 33' totoal width) at the same location. To facilitate the construction of the proposed bridge, an onsite detour is proposed on the upstream side of NC 33.

The project includes 0.130 miles of roadway improvements on each end of the bridge. 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 southeast quadrant at -L- station 18+96 RT, with the outlet pipe set at 0.1% to reduce velocity into the wetlands. No rip rap pad was specified at the drainage outlet due to the low discharge velocity and DCM's desire to minimize impacts. No defined roadside ditches exist that are impacted by the proposed slope stakes. Thus, all existing drainage patterns are maintained in the proposed design.

Waterbody Information

Surface Water Body (1):	Smith Creek	**NCDWR Stream Index No.:**	29-33-2-14		
NCDWR Surface Water Classification for Water Body		**Primary Classification:**	Class SA		
		Supplemental Classification:	High Quality Waters (HQW)	Nutrient Sensitive Waters	
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?**	No
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

STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS

(Version 2.07; Released October 2016)

WBS Element: **TIP No.:** B-5413 **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. 18+96 RT 35.269245 / -76.632115	(1)Smith Creek		N/A	0.1	Pipe	15	0.7	1.6	Yes

Additional Comments

In accordance with previous submittals and comments received from DCM, outlet protection has not been called for.

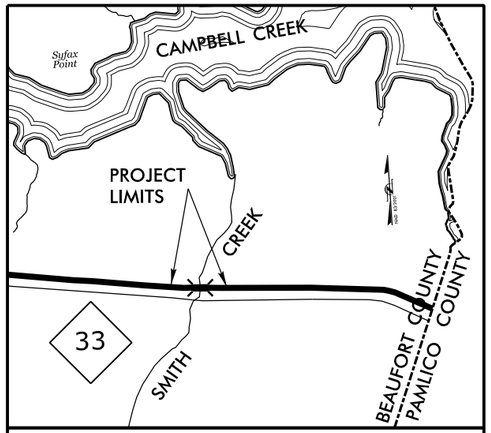
* Refer to the NCDOT Best Management Practices Toolbox (2014), NCDOT Standards, the Federal Highway Administration (FHWA) Hydraulic Engineering Circular No. 14 (HEC-14), Third Edition, Hydraulic Design of Energy Dissipators for Culverts and Channels (July 2006), as applicable, for design guidance and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

09/08/99

TIP PROJECT: B–5413

CONTRACT:

See Sheet 1A For Index of Sheets



VICINITY MAP
ON–SITE DETOUR

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

BEAUFORT COUNTY

LOCATION: REPLACE BRIDGE NO. 20 OVER SMITH CREEK ON NC 33

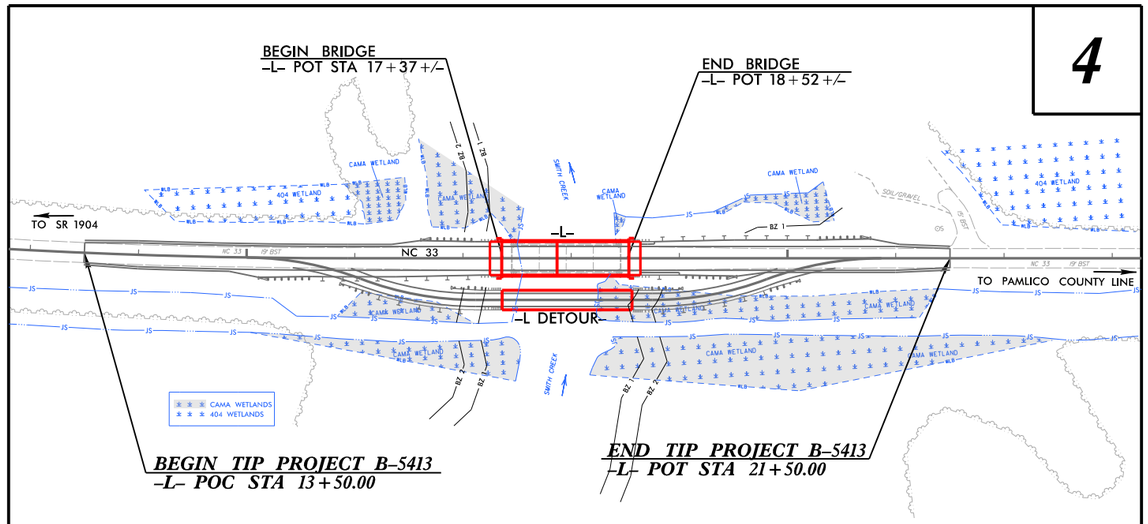
TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	B–5413	1	

STATE PROJ. NO.	F. A. PROJ. NO.	DESCRIPTION
55043.1.1		PE
55043.1.1		ROW/UTIL.

PERMIT DRAWING
SHEET 1 OF 17

WETLAND AND SURFACE WATER IMPACTS PERMIT



FOR –L DETOUR– ALIGNMENT, SEE SHEET 2B–1

NAD 83/2001

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.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

DESIGN DATA

ADT 2013 = 250
ADT 2033 = 500
K = 10 %
D = 60 %
T = 7 % *
V = 60 MPH
* TTST = 2% DUAL 5%
FUNC CLASS =
MAJOR COLLECTOR
REGIONAL TIER

PROJECT LENGTH

LENGTH OF ROADWAY TIP PROJECT B–5413 = 0.130 MILES

LENGTH OF STRUCTURE TIP PROJECT B–5413 = 0.022 MILES

TOTAL LENGTH OF TIP PROJECT B–5413 = 0.152 MILES

HNTB
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:
NOVEMBER 29, 2017

LETTING DATE:
JUNE 13, 2018

DOUGLAS M. WHEATLEY, PE
PROJECT ENGINEER

MONICA J. DUVAL
PROJECT DESIGN ENGINEER

HEATHER C. LANE, PE
NCDOT CONTACT

HYDRAULICS ENGINEER

SIGNATURE: *P.E.*

ROADWAY DESIGN ENGINEER

SIGNATURE: *P.E.*

STATE OF NORTH CAROLINA • DEPARTMENT OF TRANSPORTATION •

5/10/2018
...\b5413_hyd_prm_tsh.dgn
HNTB

WETLAND & STREAM IMPACTS

HNTB NORTH CAROLINA, P.C.
121 W. Trade St., Ste 2050
Charlotte, North Carolina 28202
NC License No: C-1554

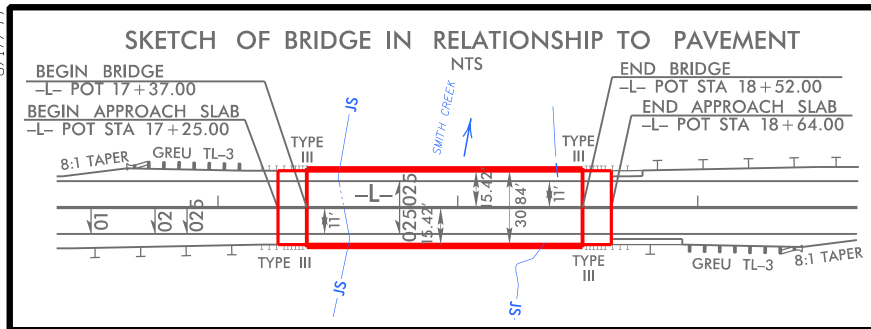
PROJECT REFERENCE NO.	SHEET NO.
B-5413	4

R/W SHEET NO.

ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING
SHEET 2 OF 17



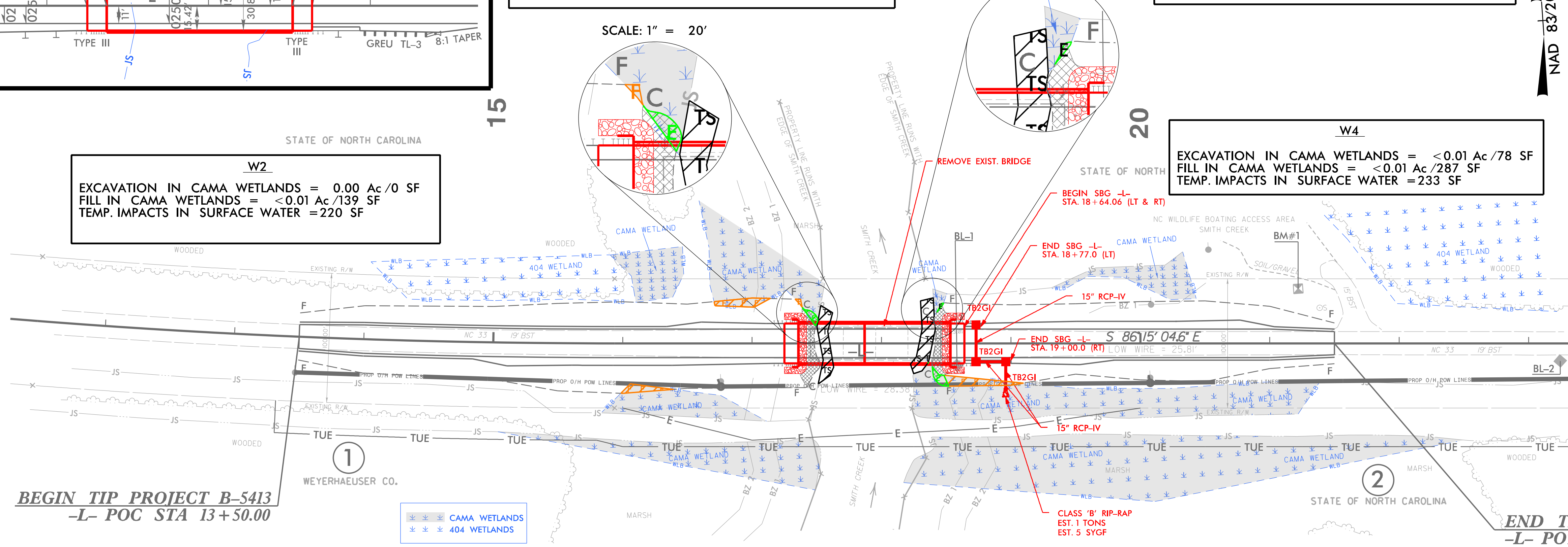
W1
EXCAVATION IN CAMA WETLANDS = <0.01 Ac / 53 SF
FILL IN CAMA WETLANDS = <0.01 Ac / 217 SF
TEMP. IMPACTS IN SURFACE WATER = 232 SF

W2
EXCAVATION IN CAMA WETLANDS = 0.00 Ac / 0 SF
FILL IN CAMA WETLANDS = <0.01 Ac / 139 SF
TEMP. IMPACTS IN SURFACE WATER = 220 SF

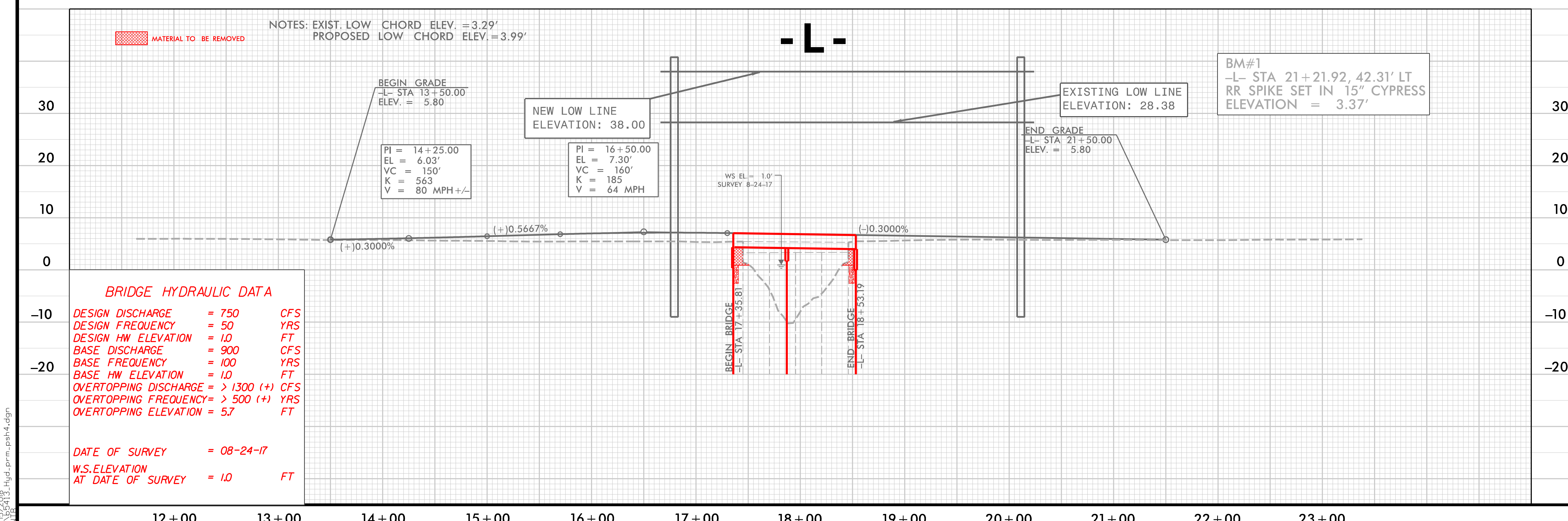
W3
EXCAVATION IN CAMA WETLANDS = <0.01 Ac / 7 SF
FILL IN CAMA WETLANDS = 0.00 Ac / 0.00 SF
TEMP. IMPACTS IN SURFACE WATER = 338 SF

W4
EXCAVATION IN CAMA WETLANDS = <0.01 Ac / 78 SF
FILL IN CAMA WETLANDS = <0.01 Ac / 287 SF
TEMP. IMPACTS IN SURFACE WATER = 233 SF

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



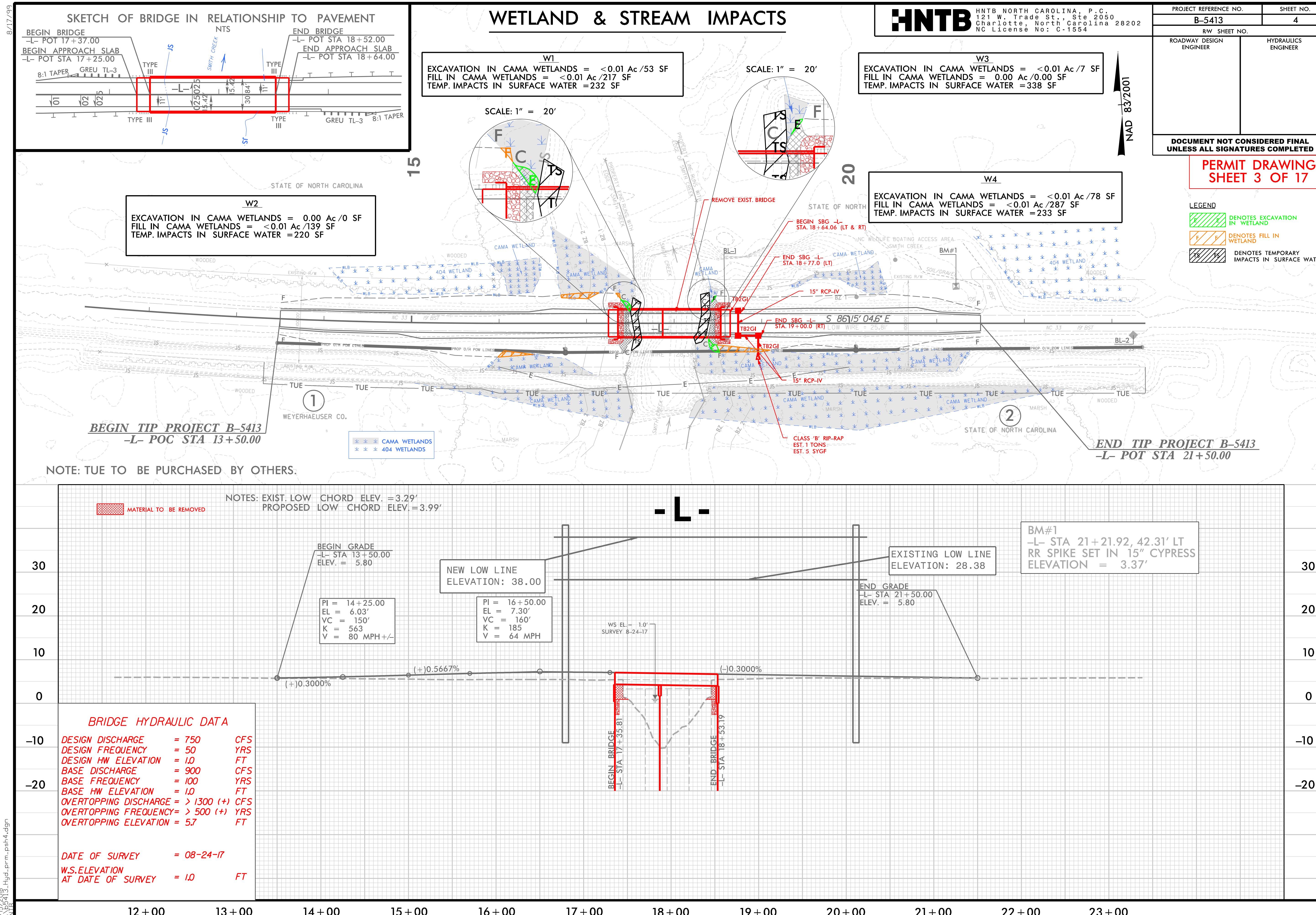
NOTE: TUE TO BE PURCHASED BY OTHERS.



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	750	CFS
DESIGN FREQUENCY	=	50	YRS
DESIGN HW ELEVATION	=	1.0	FT
BASE DISCHARGE	=	900	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	1.0	FT
OVERTOPPING DISCHARGE	=	> 1300 (+)	CFS
OVERTOPPING FREQUENCY	=	> 500 (+)	YRS
OVERTOPPING ELEVATION	=	5.7	FT
DATE OF SURVEY	=	08-24-17	
W.S. ELEVATION AT DATE OF SURVEY	=	1.0	FT

8/17/99
5/15/2018
B5413_Hyd_prm_psh4.dgn


WETLAND & STREAM IMPACTS
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121 W. Trade St., Ste 2050
Charlotte, North Carolina 28202
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PROJECT REFERENCE NO.
SHEET NO.
B-5413
4
R/W SHEET NO.
ROADWAY DESIGN ENGINEER
HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED
PERMIT DRAWING SHEET 3 OF 17
SKETCH OF BRIDGE IN RELATIONSHIP TO PAVEMENT
NTS
BEGIN BRIDGE
-L- POT 17+37.00
BEGIN APPROACH SLAB
-L- POT STA 17+25.00
END BRIDGE
-L- POT STA 18+52.00
END APPROACH SLAB
-L- POT STA 18+64.00
8:1 TAPER
GREU TL-3
TYPE III
SMITH CREEK
W1
EXCAVATION IN CAMA WETLANDS = <0.01 Ac /53 SF
FILL IN CAMA WETLANDS = <0.01 Ac /217 SF
TEMP. IMPACTS IN SURFACE WATER =232 SF
W2
EXCAVATION IN CAMA WETLANDS = 0.00 Ac /0 SF
FILL IN CAMA WETLANDS = <0.01 Ac /139 SF
TEMP. IMPACTS IN SURFACE WATER =220 SF
W3
EXCAVATION IN CAMA WETLANDS = <0.01 Ac /7 SF
FILL IN CAMA WETLANDS = 0.00 Ac /0.00 SF
TEMP. IMPACTS IN SURFACE WATER =338 SF
W4
EXCAVATION IN CAMA WETLANDS = <0.01 Ac /78 SF
FILL IN CAMA WETLANDS = <0.01 Ac /287 SF
TEMP. IMPACTS IN SURFACE WATER =233 SF
SCALE: 1" = 20'
NAD 83/2001
LEGEND
DENOTES EXCAVATION IN WETLAND
DENOTES FILL IN WETLAND
DENOTES TEMPORARY IMPACTS IN SURFACE WATER
STATE OF NORTH CAROLINA
REMOVE EXIST. BRIDGE
BEGIN SBG -L- STA. 18+64.06 (LT & RT)
END SBG -L- STA. 18+77.0 (LT)
END SBG -L- STA. 19+00.0 (RT)
15" RCP-IV
TB2GI
S 86°15' 04.6" E
BM#1
BL-1
BL-2
CAMA WETLAND
404 WETLAND
WOODED
MARSH
CLASS 'B' RIP-RAP EST. 1 TONS EST. 5 SYGF
WEYERHAEUSER CO.
BEGIN TIP PROJECT B-5413
-L- POC STA 13+50.00
END TIP PROJECT B-5413
-L- POT STA 21+50.00
CAMA WETLANDS
404 WETLANDS
NOTE: TUE TO BE PURCHASED BY OTHERS.
MATERIAL TO BE REMOVED
NOTES: EXIST. LOW CHORD ELEV. =3.29'
PROPOSED LOW CHORD ELEV.=3.99'
-L-
BEGIN GRADE
-L- STA 13+50.00
ELEV. = 5.80
NEW LOW LINE
ELEVATION: 38.00
EXISTING LOW LINE
ELEVATION: 28.38
BM#1
-L- STA 21+21.92, 42.31' LT
RR SPIKE SET IN 15" CYPRESS
ELEVATION = 3.37'
END GRADE
-L- STA 21+50.00
ELEV. = 5.80
PI = 14+25.00
EL = 6.03'
VC = 150'
K = 563
V = 80 MPH+/-
PI = 16+50.00
EL = 7.30'
VC = 160'
K = 185
V = 64 MPH
WS EL = 1.0'
SURVEY 8-24-17
(+)0.3000%
(+)0.5667%
(-)0.3000%
BEGIN BRIDGE -L- STA 17+35.81
END BRIDGE -L- STA 18+53.19
BRIDGE HYDRAULIC DATA
DESIGN DISCHARGE = 750 CFS
DESIGN FREQUENCY = 50 YRS
DESIGN HW ELEVATION = 1.0 FT
BASE DISCHARGE = 900 CFS
BASE FREQUENCY = 100 YRS
BASE HW ELEVATION = 1.0 FT
OVERTOPPING DISCHARGE = > 1300 (+) CFS
OVERTOPPING FREQUENCY= > 500 (+) YRS
OVERTOPPING ELEVATION = 5.7 FT
DATE OF SURVEY = 08-24-17
W.S.ELEVATION AT DATE OF SURVEY = 1.0 FT
30
20
10
0
-10
-20
12+00
13+00
14+00
15+00
16+00
17+00
18+00
19+00
20+00
21+00
22+00
23+00
8/17/99
5/15/2018
b5413_Hyd_prm_psh4.dgn

8/17/99

WETLAND & STREAM IMPACTS

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PROJECT REFERENCE NO.	SHEET NO.
B-5413	4
R/W SHEET NO.	

ROADWAY DESIGN ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 36786 ENGINEER DOUGLAS M. WHEATLEY

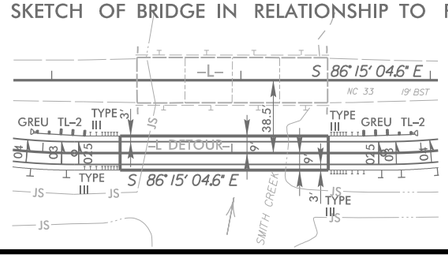
HYDRAULICS ENGINEER — NORTH CAROLINA PROFESSIONAL SEAL 15764 ENGINEER JAMES A. BYERS

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 4 OF 17

NAD 83/2001

SKETCH OF BRIDGE IN RELATIONSHIP TO PAVEMENT



STATE OF NORTH CAROLINA

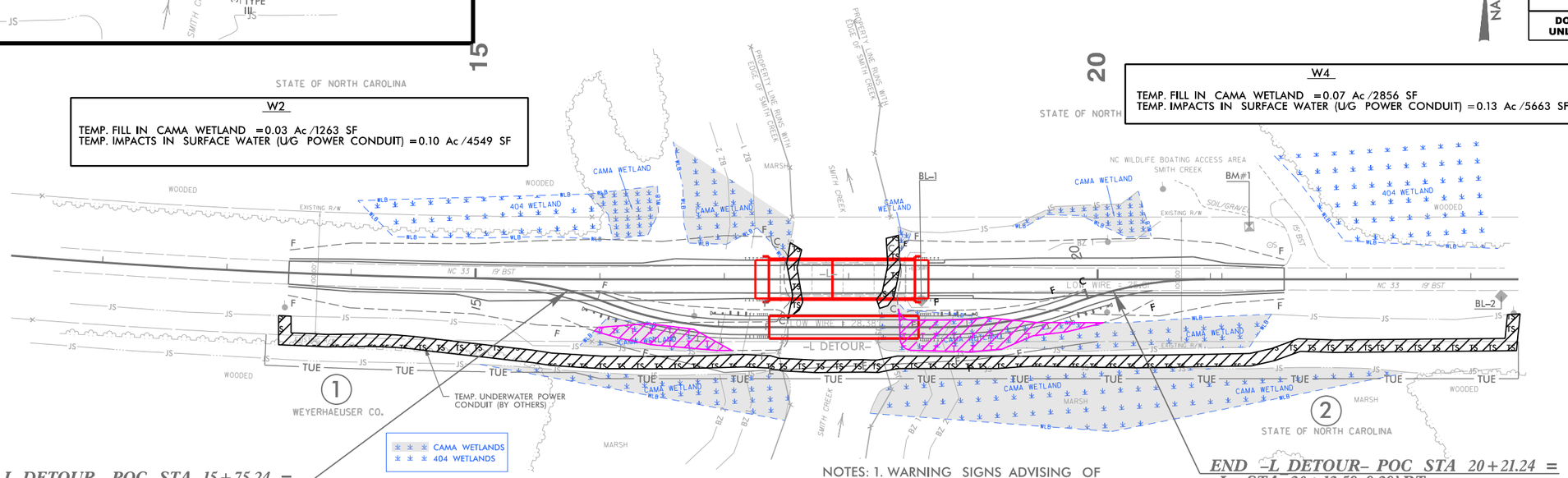
W2

TEMP. FILL IN CAMA WETLAND = 0.03 Ac /1263 SF
TEMP. IMPACTS IN SURFACE WATER (U/G POWER CONDUIT) = 0.10 Ac /4549 SF

W4

TEMP. FILL IN CAMA WETLAND = 0.07 Ac /2856 SF
TEMP. IMPACTS IN SURFACE WATER (U/G POWER CONDUIT) = 0.13 Ac /5663 SF

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



BEGIN –L DETOUR– POC STA 15+75.24 = –L– STA 15+74.44, 9.04' RT

NOTE: TUE TO BE PURCHASED BY OTHERS

NOTES: 1. WARNING SIGNS ADVISING OF UNDERWATER POWER CONDUIT TO BE PLACED IN SMITH CREEK BY OTHERS

END –L DETOUR– POC STA 20+21.24 = –L– STA 20+12.59, 9.29' RT

NOTES: EXIST. LOW CHORD ELEV. = 3.29'
PROPOSED LOW CHORD ELEV. (–L DETOUR–) = 1.06'

-L_DETOUR-

BM#1
–L– STA 21+21.92, 42.31' LT
RR SPIKE SET IN 15" CYPRESS
ELEVATION = 3.37'

BEGIN GRADE
–L DETOUR– STA 15+75.24
ELEV. = 5.55'

PI = 16+15.00
EL = 5.43'
VC = 75'
K = 39
V = 38 MPH

PI = 16+90.00
EL = 3.77'
VC = 75'
K = 39
V = 31 MPH

END GRADE
–L DETOUR– STA 20+21.24
ELEV. = 5.45'

PI = 18+95.00
EL = 3.15'
VC = 76'
K = 26
V = 25 MPH

PI = 19+75.00
EL = 5.24'
VC = 75'
K = 35
V = 37 MPH

WS EL = 1.0'
SURVEY 8-24-17

(–)0.3000% (–)2.2143% (–)0.3000% (+)2.6063% (+)0.4542%

BEGIN BRIDGE –L– STA 17+20.90

END BRIDGE –L– STA 18+69.90

TEMP U/G POW CONDUIT

20 10 0 –10 –20

12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00 21+00 22+00 23+00

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 430	CFS
DESIGN FREQUENCY	= 10	YRS
DESIGN HW ELEVATION	= 1.3	FT
BASE DISCHARGE	= 900	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 1.3	FT
OVERTOPPING DISCHARGE	= > 900(+)	CFS
OVERTOPPING FREQUENCY	= > 100(+)	YRS
OVERTOPPING ELEVATION	= 3.5	FT
DATE OF SURVEY	= 08/24/17	
W.S.ELEVATION AT DATE OF SURVEY	= 1.0	FT

5/15/2018
x:\5413_Hyd_prm_psh4_detour.dgn
HNTB

8/17/99

WETLAND & STREAM IMPACTS

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PERMIT DRAWING SHEET 5 OF 17

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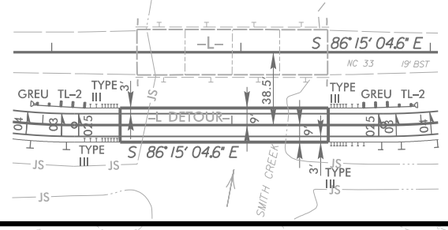
SKETCH OF BRIDGE IN RELATIONSHIP TO PAVEMENT



STATE OF NORTH CAROLINA

W2

TEMP. FILL IN CAMA WETLAND = 0.03 Ac /1263 SF
TEMP. IMPACTS IN SURFACE WATER (U/G POWER CONDUIT) = 0.10 Ac /4549 SF

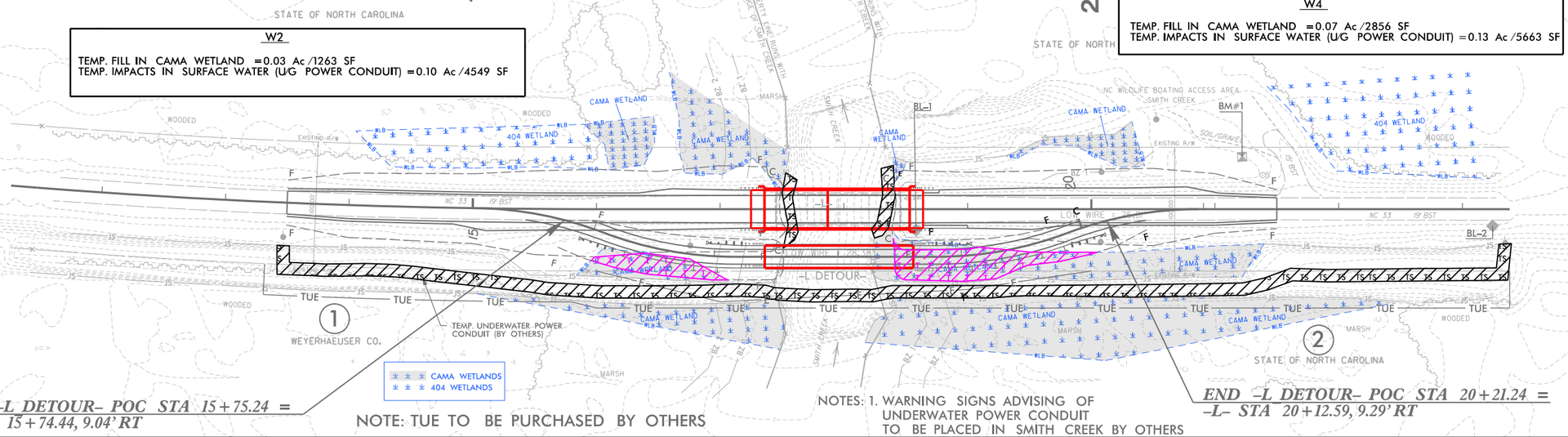
W4

TEMP. FILL IN CAMA WETLAND = 0.07 Ac /2856 SF
TEMP. IMPACTS IN SURFACE WATER (U/G POWER CONDUIT) = 0.13 Ac /5663 SF

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

15

20



CAMA WETLANDS
404 WETLANDS

BEGIN -L DETOUR- POC STA 15+75.24 = -L- STA 15+74.44, 9.04' RT

NOTE: TUE TO BE PURCHASED BY OTHERS

NOTES: 1. WARNING SIGNS ADVISING OF UNDERWATER POWER CONDUIT TO BE PLACED IN SMITH CREEK BY OTHERS

END -L DETOUR- POC STA 20+21.24 = -L- STA 20+12.59, 9.29' RT

NOTES: EXIST. LOW CHORD ELEV. = 3.29'
PROPOSED LOW CHORD ELEV. (-L_DETOUR-) = 1.06'

-L_DETOUR-

BM#1
-L- STA 21+21.92, 42.31' LT
RR SPIKE SET IN 15" CYPRESS
ELEVATION = 3.37'

BEGIN GRADE
-L_DETOUR- STA 15+75.24
ELEV. = 5.55'

PI = 16+15.00
EL = 5.43'
VC = 75'
K = 39
V = 38 MPH

PI = 16+90.00
EL = 3.77'
VC = 75'
K = 39
V = 31 MPH

PI = 18+95.00
EL = 3.15'
VC = 76'
K = 26
V = 25 MPH

PI = 19+75.00
EL = 5.24'
VC = 75'
K = 35
V = 37 MPH

END GRADE
-L_DETOUR- STA 20+21.24
ELEV. = 5.45'

WS EL = 1.0'
SURVEY 8-24-17

(-)0.3000% (-)2.2143% (-)0.3000% (+)2.6063% (+)0.4542%

BEGIN BRIDGE -L- STA 17+20.90

END BRIDGE -L- STA 18+66.90

TEMP U/G POW CONDUIT

20 10 0 -10 -20

12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00 21+00 22+00 23+00

BRIDGE HYDRAULIC DATA

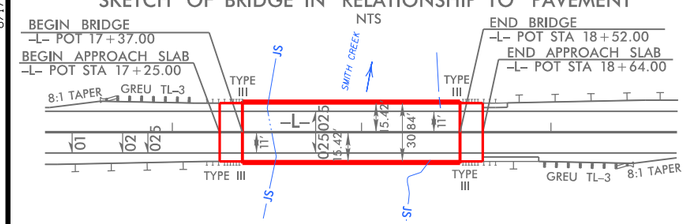
DESIGN DISCHARGE	= 430	CFS
DESIGN FREQUENCY	= 10	YRS
DESIGN HW ELEVATION	= 1.3	FT
BASE DISCHARGE	= 900	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 1.3	FT
OVERTOPPING DISCHARGE	= > 900(+)	CFS
OVERTOPPING FREQUENCY	= > 100(+)	YRS
OVERTOPPING ELEVATION	= 3.5	FT
DATE OF SURVEY	= 08/24/17	
W.S.ELEVATION AT DATE OF SURVEY	= 1.0	FT

5/15/2018
x:\5413_Hyd_prm_psh4_detour.dgn
HNTB

8/17/99

SKETCH OF BRIDGE IN RELATIONSHIP TO PAVEMENT

NTS



BUFFER IMPACTS

B2
ZONE 1 BUFFER IMPACTS = 752 SF
ZONE 2 BUFFER IMPACTS = 516 SF

B3
ZONE 1 BUFFER IMPACTS = 271 SF
ZONE 2 BUFFER IMPACTS = 158 SF

B1
ZONE 1 BUFFER IMPACTS = 3555 SF
ZONE 2 BUFFER IMPACTS = 0 SF

B4
ZONE 1 BUFFER IMPACTS = 226 SF
ZONE 2 BUFFER IMPACTS = 93 SF

NAD 83/2001

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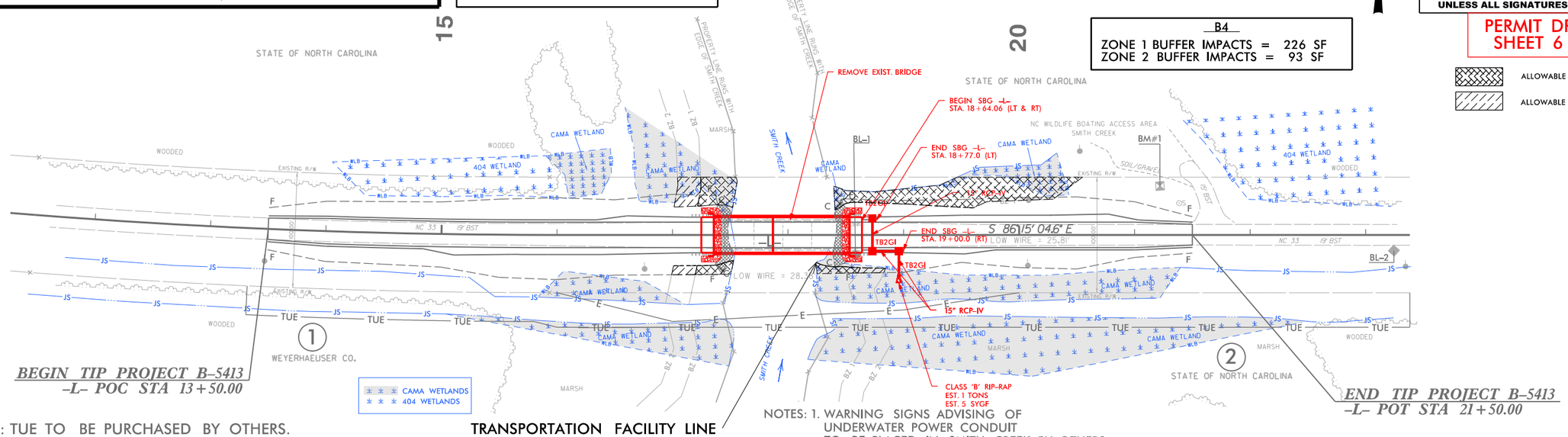
Charlotte, North Carolina 28202
NC License No: C-1554

PROJECT REFERENCE NO.	SHEET NO.
B-5413	4
R/W SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

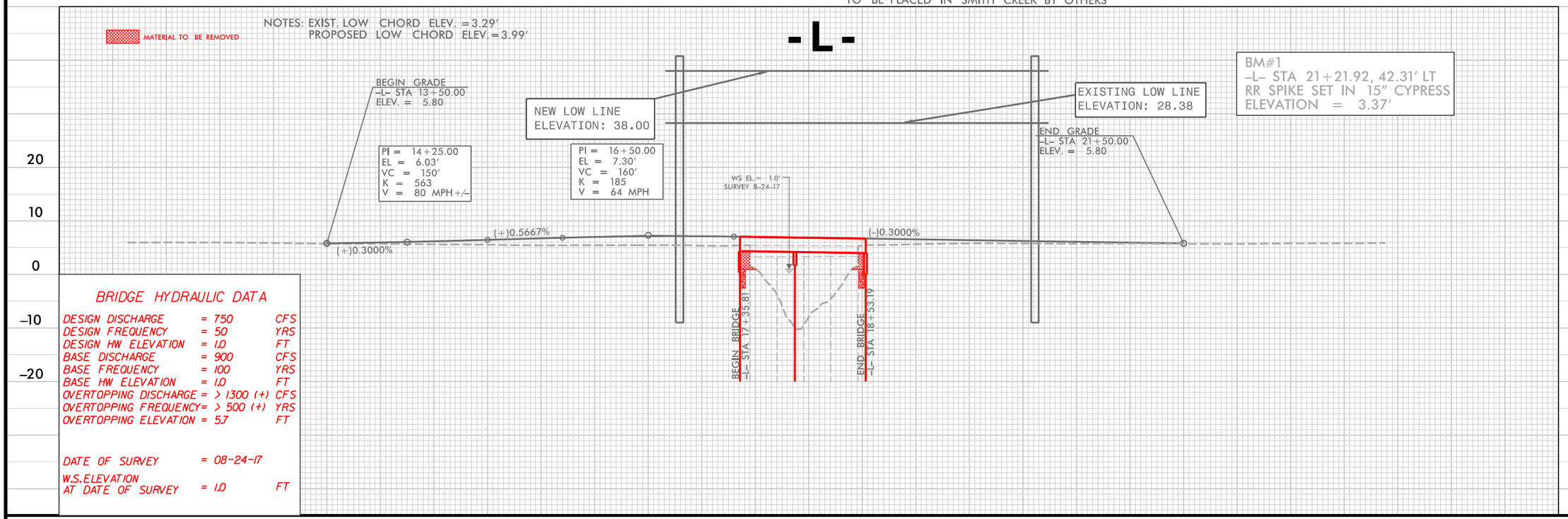
PERMIT DRAWING SHEET 6 OF 17

ALLOWABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2



NOTE: TUE TO BE PURCHASED BY OTHERS.

NOTES: 1. WARNING SIGNS ADVISING OF UNDERWATER POWER CONDUIT TO BE PLACED IN SMITH CREEK BY OTHERS



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 750	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 1.0	FT
BASE DISCHARGE	= 900	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 1.0	FT
OVERTOPPING DISCHARGE	= > 1300 (+)	CFS
OVERTOPPING FREQUENCY	= > 500 (+)	YRS
OVERTOPPING ELEVATION	= 5.7	FT
DATE OF SURVEY	= 08-24-17	
W.S.ELEVATION AT DATE OF SURVEY	= 1.0	FT

5/10/2018
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BUFFER IMPACTS

HNTB NORTH CAROLINA, P.C.
121 W. Trade St., Ste 2050
Charlotte, North Carolina 28202
NC License No: C-1554

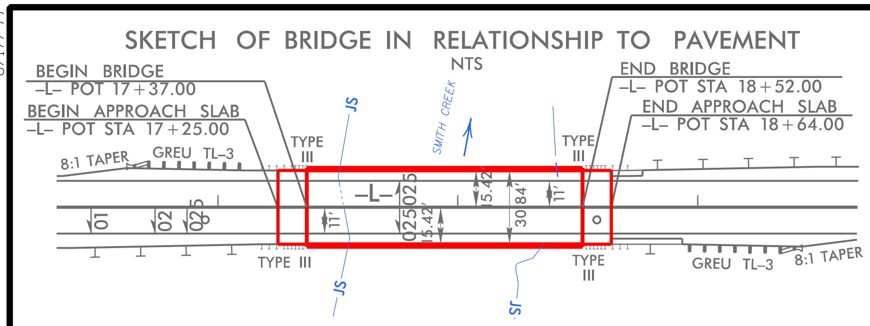
PROJECT REFERENCE NO.	SHEET NO.
B-5413	4

R/W SHEET NO.

ROADWAY DESIGN ENGINEER — SEAL 36786, DOUGLAS M. WHEATLEY, NORTH CAROLINA PROFESSIONAL ENGINEER

HYDRAULICS ENGINEER — SEAL 15764, JAMES A. BYRD, NORTH CAROLINA PROFESSIONAL ENGINEER

PERMIT DRAWING SHEET 7 OF 17



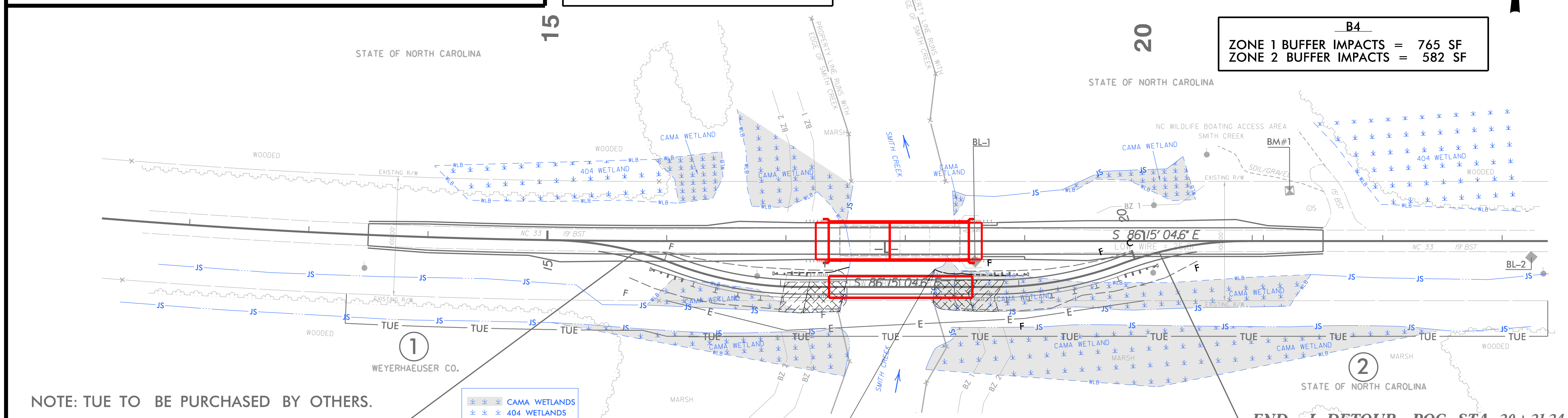
B2
ZONE 1 BUFFER IMPACTS = 0 SF
ZONE 2 BUFFER IMPACTS = 0 SF

B3
ZONE 1 BUFFER IMPACTS = 781 SF
ZONE 2 BUFFER IMPACTS = 520 SF

B1
ZONE 1 BUFFER IMPACTS = 0 SF
ZONE 2 BUFFER IMPACTS = 0 SF

B4
ZONE 1 BUFFER IMPACTS = 765 SF
ZONE 2 BUFFER IMPACTS = 582 SF

ALLOWABLE IMPACTS ZONE 1
ALLOWABLE IMPACTS ZONE 2



NOTE: TUE TO BE PURCHASED BY OTHERS.

BEGIN -L DETOUR- POC STA 15+75.24 = -L- STA 15+74.44, 9.04' RT

TRANSPORTATION FACILITY LINE

NOTES: 1. WARNING SIGNS ADVISING OF UNDERWATER POWER CONDUIT TO BE PLACED IN SMITH CREEK BY OTHERS

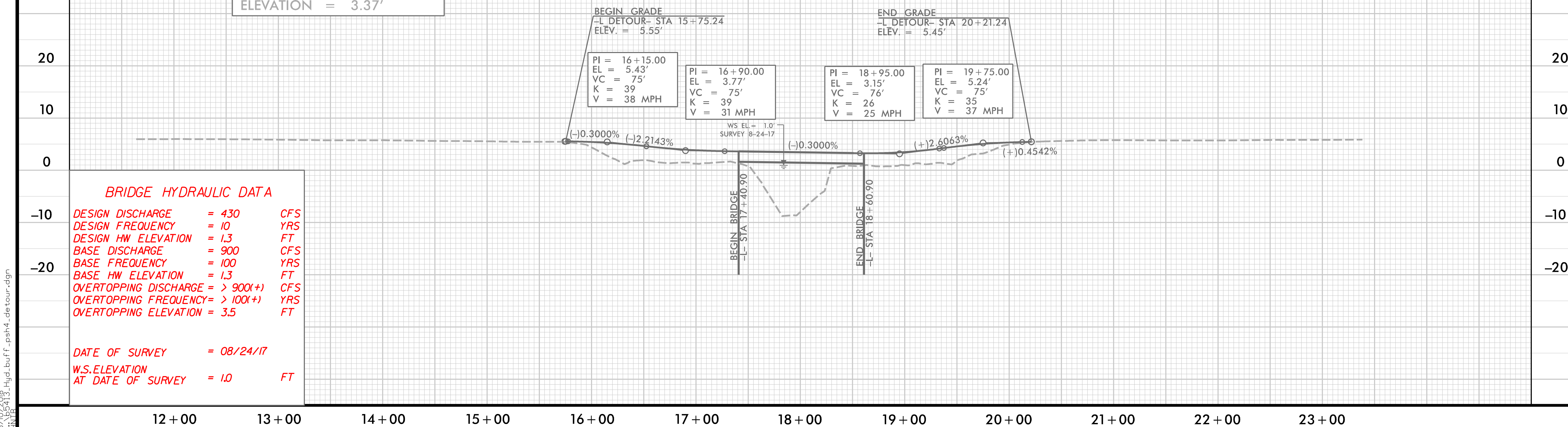
END -L DETOUR- POC STA 20+21.24 = -L- STA 20+12.59, 9.29' RT

-L_DETOUR-

MATERIAL TO BE REMOVED

NOTES: EXIST. LOW CHORD ELEV. = 3.29'
PROPOSED LOW CHORD ELEV. (-L_DETOUR-) = 1.06'

BM#1
-L- STA 21+21.92, 42.31' LT
RR SPIKE SET IN 15" CYPRESS
ELEVATION = 3.37'



BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	=	430	CFS
DESIGN FREQUENCY	=	10	YRS
DESIGN HW ELEVATION	=	1.3	FT
BASE DISCHARGE	=	900	CFS
BASE FREQUENCY	=	100	YRS
BASE HW ELEVATION	=	1.3	FT
OVERTOPPING DISCHARGE	=	> 900(+)	CFS
OVERTOPPING FREQUENCY	=	> 100(+)	YRS
OVERTOPPING ELEVATION	=	3.5	FT
DATE OF SURVEY	=	08/24/17	
W.S. ELEVATION AT DATE OF SURVEY	=	1.0	FT

8/17/99
5/10/2018 ...\B5413_Hyd_buff_psh4_detour.dgn

8/17/99

PROJECT REFERENCE NO.	SHEET NO.
B-5413	UO-3

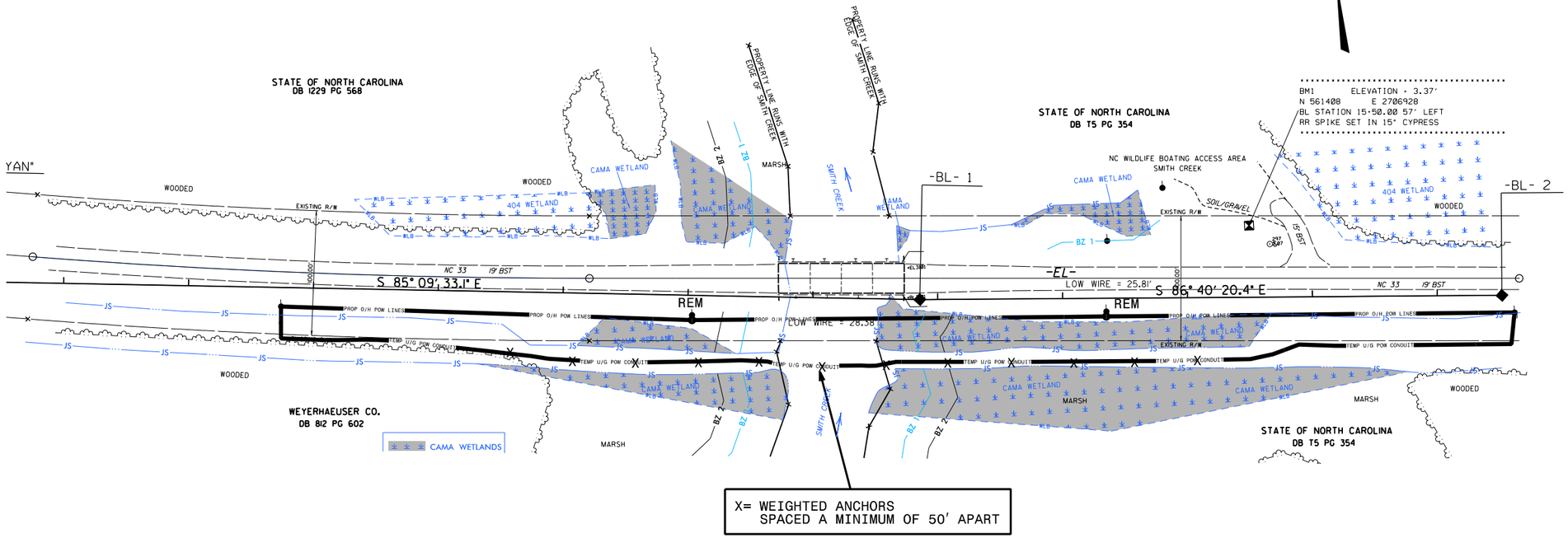
UTILITIES BY OTHERS

POWER: TIDELAND EMC
CONTACT: JOHN MARSH
1-800-637-1079 x4324
NOTES:

1. TIDELAND EMC TO LAY A TEMPORARY CONDUIT IN THE DITCH FROM POLE AT STA # 13+45 TO POLE AT STA# 23+38.
2. TIDELAND EMC TO PLACE TEMPORARY CABLE IN SCHEDULE 40 HDPE CONDUIT. CONDUIT WILL BE OPEN ON BOTH ENDS AND FILLED WITH WATER TO MINIMIZE BOUYANCY.
3. TIDELAND EMC TO USE EPR (ETHYLENE PROPYLENE RUBBER) RUBBER COATED CABLE.
4. A MINIMUM OF 8# WEIGHTED ANCHORS TO BE USED TO KEEP CONDUIT FROM FLOATING. ANCHORS WILL BE ATTACHED TO CONDUIT WITH WRAP LOCK TIES.
5. ANCHORS TO BE PLACED AT APPROX 50' INTERVALS ALONG SMITH CREEK STREAM BED AND SIDE DITCHES AS NEEDED TO STABILIZE CONDUIT ON CREEK BOTTOM. DISTANCES MAY BE SHORTER DEPENDING ON STABILIZATION NEEDS DEEMED NECESSARY AT TIME OF INSTALLATION.
6. TIDELAND EMC TO PLACE SIGNS STATING "BURIED POWERLINE CABLE BELOW" ALONG SIDE DITCHES AND ON SMITH CREEK TO MARK THE CONDUITS LOCATION.
7. ANY REQUIRED EASEMENTS REQUIRED TO PERFORM WORK WILL BE OBTAINED BY TIDELAND EMC.

NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR PROPOSED UTILITY WORK SHOWN ON THIS SHEET.

PERMIT DRAWING
SHEET 8 OF 17

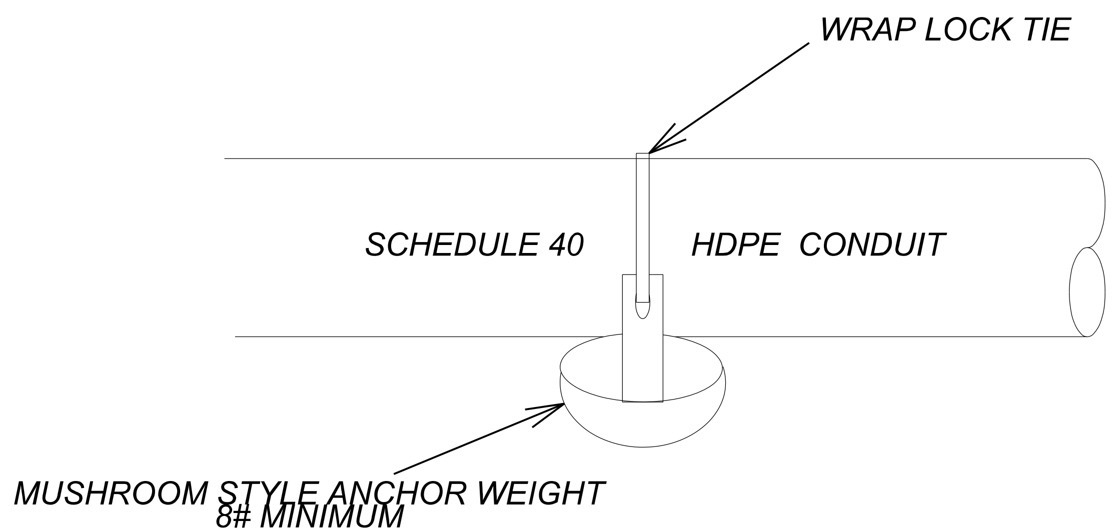


PROJECT REFERENCE NO.	SHEET NO.
B-5413	UO-4

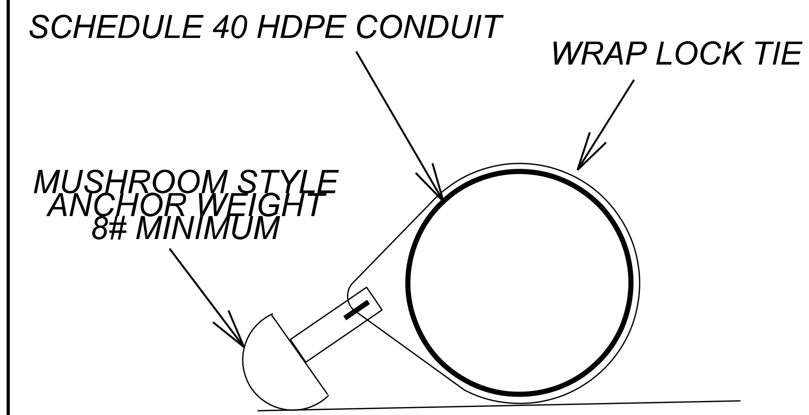
UTILITIES BY OTHERS

NOTE:
ALL PROPOSED UTILITY WORK SHOWN ON THIS SHEET WILL BE DONE BY OTHERS. NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR PROPOSED UTILITY WORK SHOWN ON THIS SHEET.

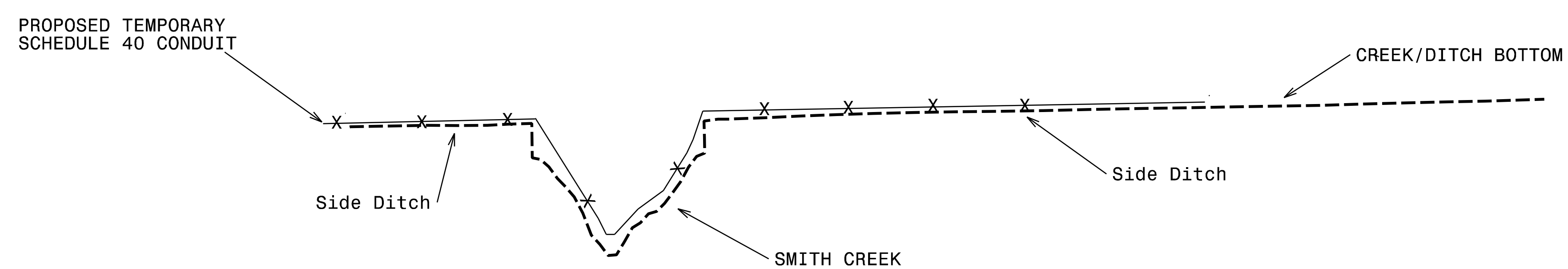
PERMIT DRAWING
SHEET 9 OF 17



SECTION VIEW
NTS



ANCHOR DETAIL
NTS



SECTION VIEW
NTS

8/17/99

5/10/2018
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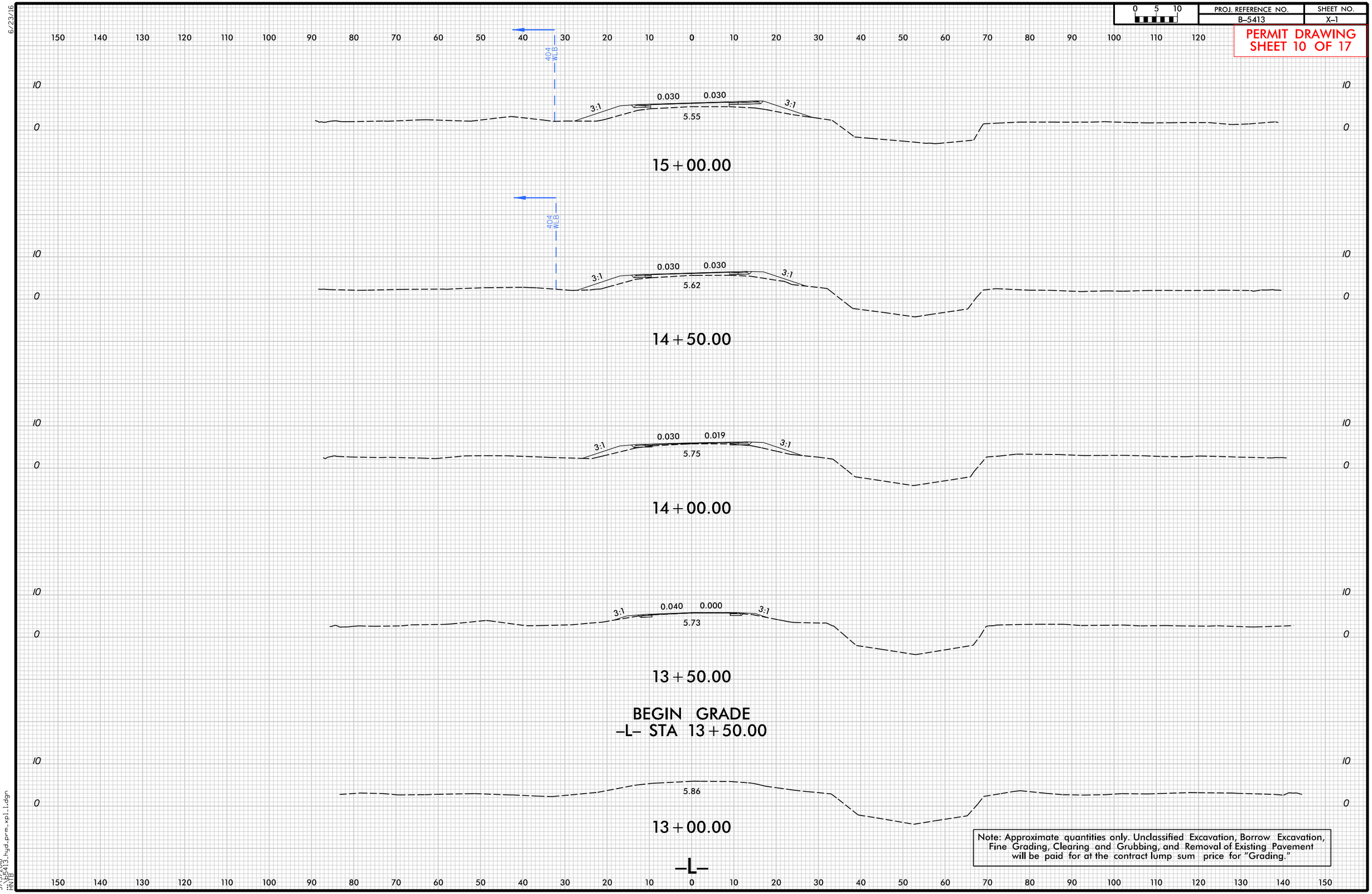
HNTB

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B–5413	X–1

PERMIT DRAWING
SHEET 10 OF 17



Note: Approximate quantities only. Unclassified Excavation, Borrow Excavation, Fine Grading, Clearing and Grubbing, and Removal of Existing Pavement will be paid for at the contract lump sum price for "Grading."

5/15/2018
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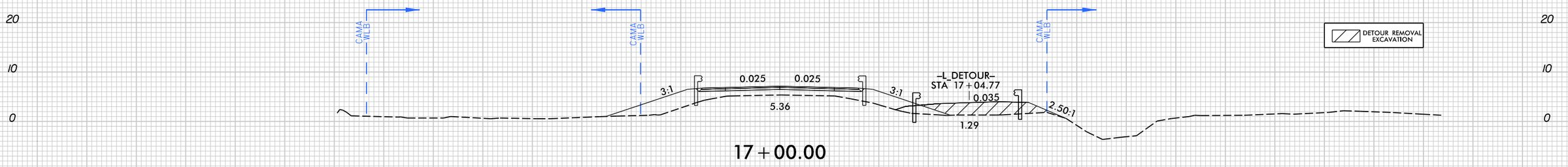
HNTB

6/23/16

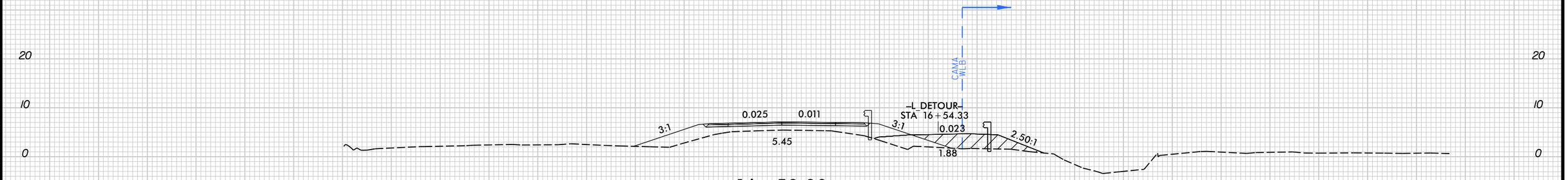
0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-5413	X-2

PERMIT DRAWING
SHEET 11 OF 17

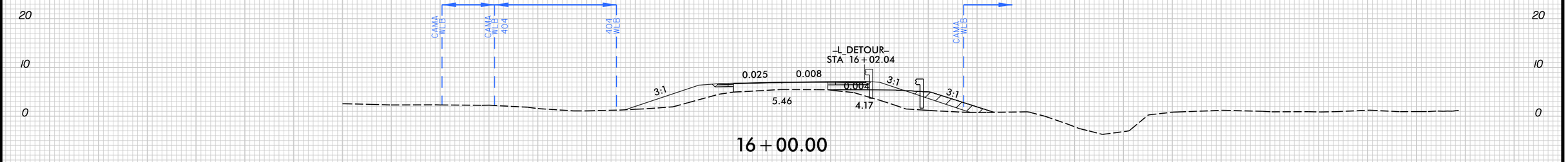
150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120



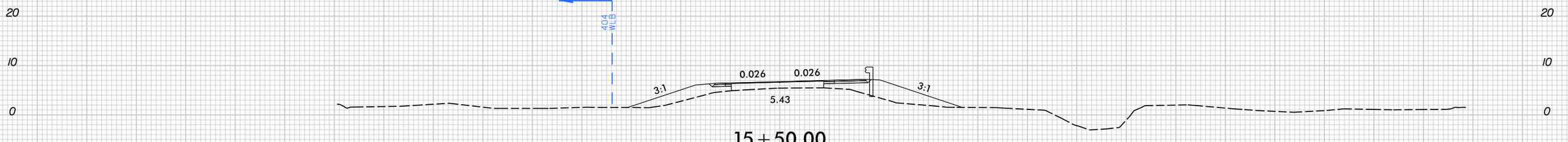
17+00.00



16+50.00



16+00.00



15+50.00

-L-

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

5/15/2018
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HNTB

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-5413	X-3

PERMIT DRAWING
SHEET 12 OF 17

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

DETOUR REMOVAL EXCAVATION

10
0

CAMA WLB

–L DETOUR–
STA 19+04.80

0.025 0.025
3:1
5.65
3:1
0.037
2.50:1
0.99

19+00.00

END BRIDGE
–L– STA 18+53.19

0.025 0.025
5.50

–L DETOUR–
STA 18+54.78

18+50.00

20
10
0
-10

0.025 0.025

–L DETOUR–
STA 18+04.78

–7.45

18+00.00

0.025 0.025

–L DETOUR–
STA 17+54.78

0.37

17+50.00
BEGIN BRIDGE
–L– STA 17+35.81
–L–

5/15/2018
B-5413_hyd_prm_xpl_1.dgn
HNTB

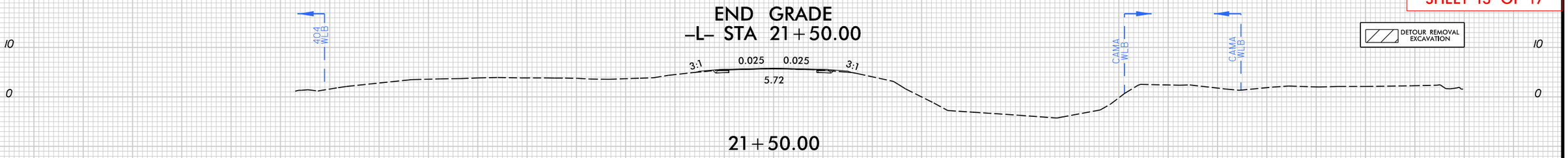
6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B-5413	X-4

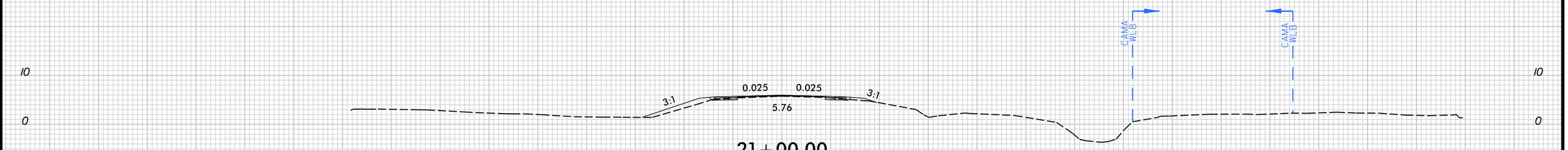
PERMIT DRAWING
SHEET 13 OF 17

DETOUR REMOVAL EXCAVATION

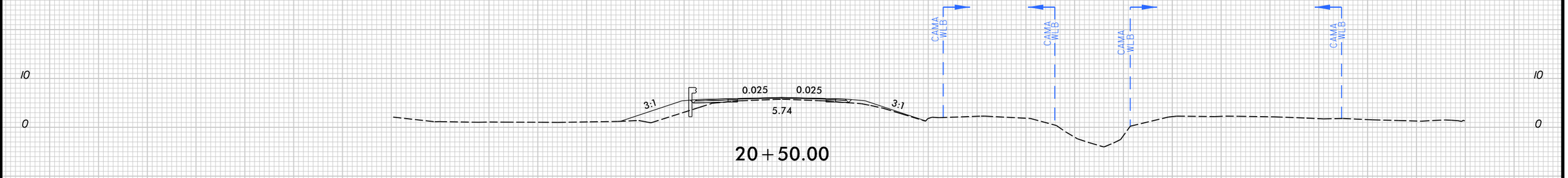
END GRADE –L– STA 21+50.00



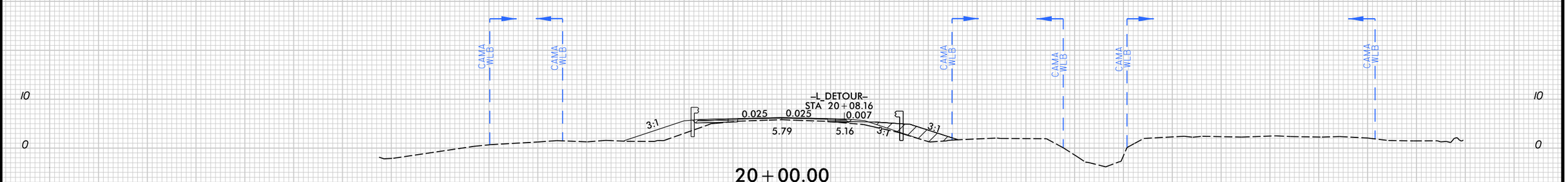
21+50.00



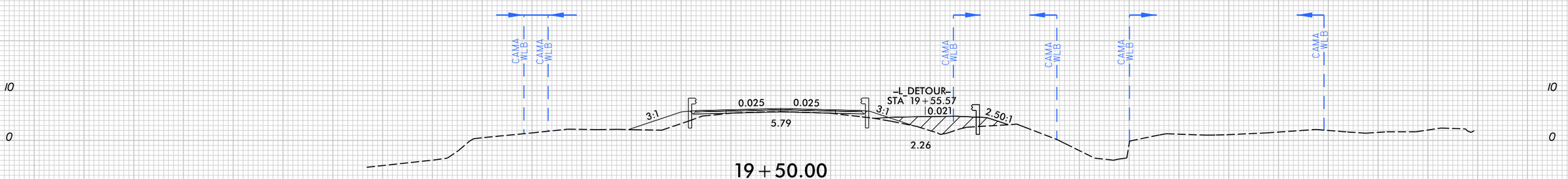
21+00.00



20+50.00

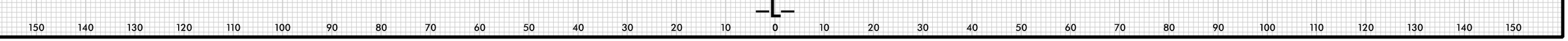


20+00.00



19+50.00

–L–



5/15/2018
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HNTB

6/23/16

0 5 10	PROJ. REFERENCE NO.	SHEET NO.
	B–5413	X–5

PERMIT DRAWING
SHEET 14 OF 17

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

10

0

-10

5.71

CAMA WEB

22+00.00

–L–

10

0

-10

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

5/15/2018
B-5413_hyd_prm_xpl_1.dgn
HNTB

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+96 TO STA. 20+05	24" CORED SLAB BRIDGE	0.01		<0.01	0.00	0.00	0	0.02	0	66	0
1	-L_DET- STA. 15+75 TO STA. 20+21	24" CORED SLAB BRIDGE		0.10								
1	-L- STA. 13+50 TO STA. 23+37 (RT)	6" U/G POWER CONDUIT							0.23			
TOTALS:			0.01	0.10	<0.01	0.00	0.00	0.00	0.25	0	66	0

*Rounded totals are sum of actual impacts

NOTES:
Existing channel impacts are measured along the centerline of the stream.

Permanent Fill in Wetlands: 643 SF
Temporary Fill in Wetlands: 4119 SF
Excavation in Wetlands: 138 SF
Temporary Impacts in Surface Water (BRIDGE): 1023 SF
Temporary Impacts in Surface Water (U/G POWER CONDUIT): 10212 SF

NC DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

BEAUFORT COUNTY BRIDGE NO. 020
B-5413

WETLANDS IN BUFFER IMPACTS SUMMARY

SITE NO.	STATION (FROM/TO)		WETLANDS IN BUFFERS	
			ZONE 1 (ft^2)	ZONE 2 (ft^2)
1	-L- 16+94 TO 20+55		0	0
1	-L- 16+94 TO 20+55 (CAMA)		1539	409
1	-L_DET- 15+75 TO 20+21		0	0
1	-L_DET- 15+75 TO 20+21 (CAMA)		765	652
TOTAL:			2304	1061

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

BEAUFORT COUNTY BRIDGE NO. 020
PROJECT: B-5413

DATE 5/10/2018
SHEET 17 OF 17

Rev. Jan 2009

RIPARIAN BUFFER IMPACTS SUMMARY

			IMPACT									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE				
SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	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	24" CORED SLAB BRIDGE	-L- 16+94 TO 20+55		X		4804	1102	5906					
1	24" CORED SLAB BRIDGE	-L_DET- 15+75 TO 20+21		X		1546	767	2313					
TOTAL:						6350	1869	8219	0	0	0	0	0

N.C. DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS

BEAUFORT COUNTY BRIDGE NO. 020
PROJECT: B-5413

DATE 5/10/2018
SHEET 16 OF 17

Rev. SEP 2016