



North Carolina Department of Transportation

Highway Stormwater Program
STORMWATER MANAGEMENT PLAN
FOR NCDOT PROJECTS



(Version 2.07; Released October 2016)

WBS Element: 17BP.2.R.85 TIP No.: County(ies): Beaufort Page 1 of 2

General Project Information

| | | | | | | | |
|---------------------------------|--|---|------------------------|---|--------------------|---|-----------|
| WBS Element: | 17BP.2.R.85 | TIP Number: | | Project Type: | Bridge Replacement | Date: | 6/28/2018 |
| 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: | rtturnbull@esinc.cc | | | Email: | jabyrd@hntb.com | |
| City/Town: | Bath | | County(ies): | Beaufort | | | |
| River Basin(s): | Tar-Pamlico | | CAMA County? | Yes | | | |
| Wetlands within Project Limits? | Yes | | | | | | |

Project Description

| | | | | | | | | |
|--|--|-----------------------|-----------------------------------|--|-----------|------|-------|------|
| Project Length (lin. miles or feet): | 0.13 | Surrounding Land Use: | Rural Residential and Agriculture | | | | | |
| | Proposed Project | | | Existing Site | | | | |
| Project Built-Upon Area (ac.) | 1.2 | ac. | 0.5 | ac. | | | | |
| Typical Cross Section Description: | 2 - 10' asphalt paved lanes with 2' paved shoulders, 4' grass shoulders. | | | 2 - 10' asphalt paved lanes with grass shoulders. Wetlands are present in all four quadrants. CAMA wetlands are distinguished from 404 wetlands. | | | | |
| Annual Avg Daily Traffic (veh/hr/day): | Design/Future: | 530 | Year: | 2011 | Existing: | 1060 | Year: | 2031 |
| General Project Narrative: (Description of Minimization of Water Quality Impacts) | <p>State project 17BP.2.R.85 involves the replacement of Beaufort County Bridge #060249 on SR 1336 (Hawkins Beach Rd.) over Duck Creek. The existing bridge consists of 1 @ 17' - 10", 1 @ 17' - 1", and 1 @ 17' - 9" timber deck on timber joists, steel caps, and timber piles. It is to be replaced with a 1 @ 30' - 0" and 1 @ 55' - 0" 21" cored slab (85' total length, 33' total width) at the same location. To facilitate the construction of the proposed bridge, an onsite detour is proposed on the downstream side of SR 1336.</p> <p>The project includes 0.110 miles of roadway improvements. In accordance with Tar-Pamlico River Buffer Regulations, the proposed bridge does not contain deck drains. All stormwater from the bridge and approaches 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 northeastern quadrant at -L- station 16+18 LT, with the outlet pipe set at 0.1% to reduce velocity into the wetlands. A Class 'B' rip rap pad was specified at the drainage outlet to lower discharge velocity and 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.</p> | | | | | | | |

Waterbody Information

| | | | | | | | | |
|--|------------------------------|--|-------------------------|-------------------------------------|--|--|-------------------------|-------------|
| Surface Water Body (1): | Duck Creek | | NCDWR Stream Index No.: | 29-16-(2) | | | | |
| NCDWR Surface Water Classification for Water Body | Primary Classification: | Class SC | | | | | | |
| | 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? | | | | 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) | | | | | | | | |



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Preformed Scour Holes and Energy Dissipators

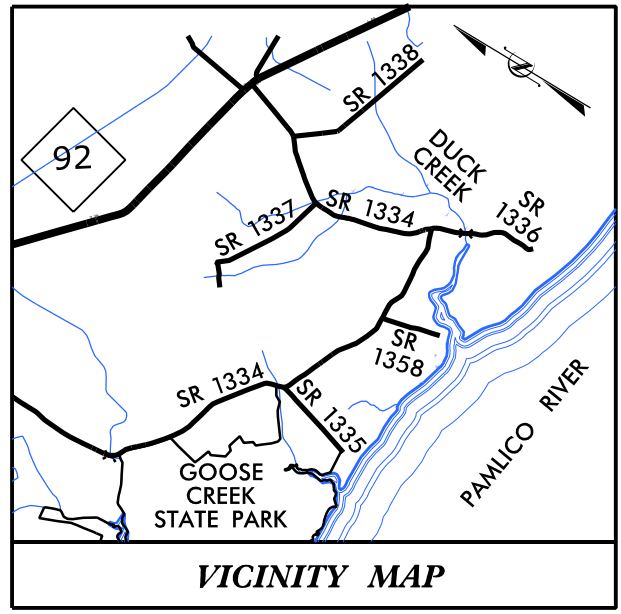
| Sheet No. | Station & Coordinates (Road and Non Road Projects) | Surface Water Body | Energy Dissipator Type | Riprap Type | Drainage Area (ac) | Conveyance Structure | Pipe/Structure Dimensions (in) | Q10 (cfs) | V10 (fps) | BMP Associated w/ Buffer Rules? |
|-----------|--|--------------------|--------------------------------|-------------|--------------------|----------------------|--------------------------------|-----------|-----------|---------------------------------|
| 4 | -L- Sta. 16+18 LT 35.462992 / -76.854354 | (1)Duck Creek | Riprap Energy Dissipator Basin | Class 'B' | 0.1 | Pipe | 15 | 0.8 | 1.6 | Yes |
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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.

09/08/19

TIP PROJECT: 17BP.2.R.85



VICINITY MAP

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
BEAUFORT COUNTY

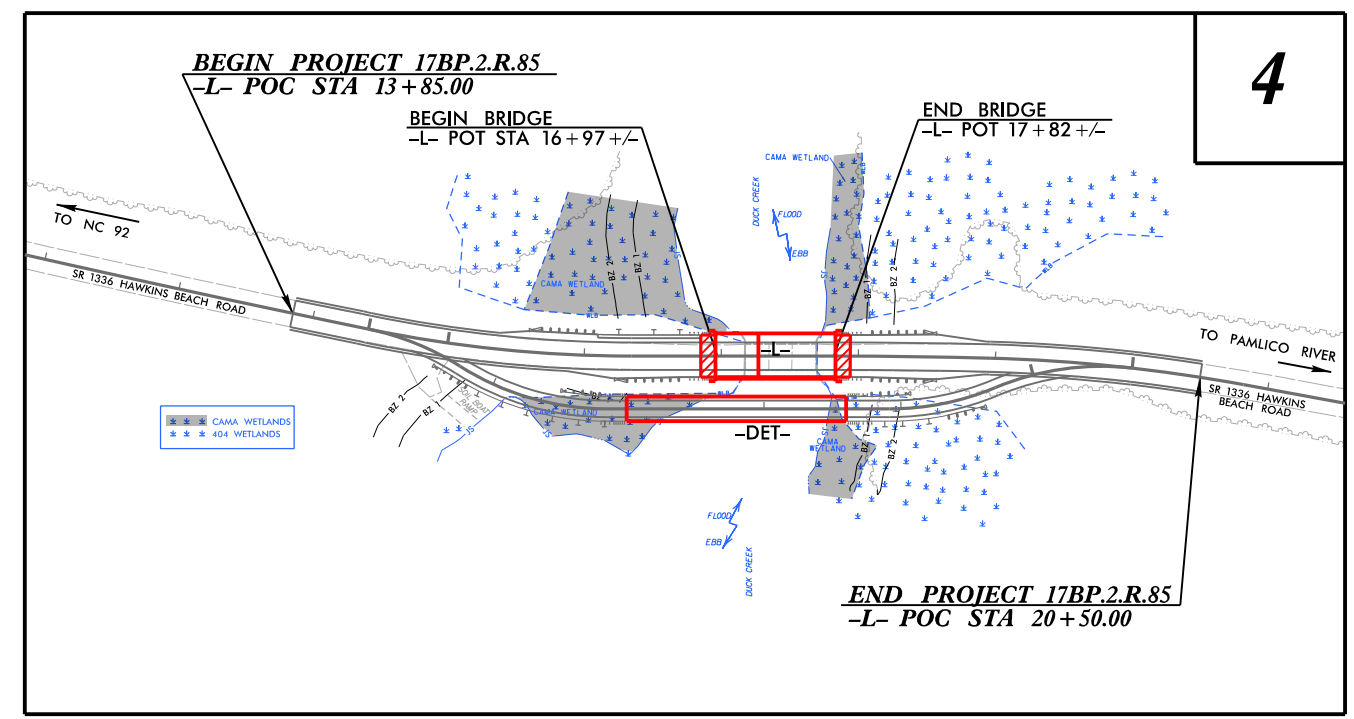
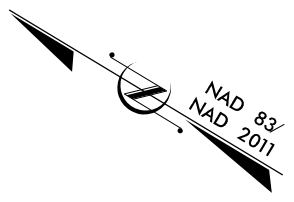
**LOCATION: REPLACE BRIDGE NO. 249 OVER DUCK CREEK
ON SR 1336 (HAWKINS BEACH ROAD)**

TYPE OF WORK: GRADING, DRAINAGE, PAVING AND STRUCTURE

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|-----------------|-----------------------------|-------------|--------------|
| N.C. | 17.BP.2.R.85 | 1 | |
| STATE PROJ. NO. | F.A. PROJ. NO. | DESCRIPTION | |
| 17BP.2.R.85 | | PE | |
| 17BP.2.R.85 | | ROWUTIL | |
| | | | |
| | | | |
| | | | |

**PERMIT DRAWING
SHEET 1 OF 14**

WETLAND AND SURFACE WATER IMPACTS PERMIT

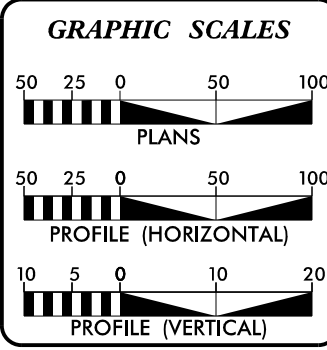


NOTES:

- CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.
- THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.
- SEE SHEET 2B-1 FOR TEMPORARY DETOUR

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

CONTRACT:



DESIGN DATA

| | |
|-------------------|------------|
| ADT 2011 = | 530 |
| ADT 2031 = | 1060 |
| K = | 10 % |
| D = | 60 % |
| T = | 6 % * |
| V = | 60 MPH |
| * TTST = | 2% DUAL 4% |
| FUNC CLASS = | LOCAL |
| SUB-REGIONAL TIER | |

PROJECT LENGTH

| | |
|---|-------------|
| LENGTH OF ROADWAY PROJECT 17BP.2.R.85 = | 0.110 MILES |
| LENGTH OF STRUCTURE PROJECT 17BP.2.R.85 = | 0.016 MILES |
| TOTAL LENGTH OF PROJECT 17BP.2.R.85 = | 0.126 MILES |

HNTB
2012 STANDARD SPECIFICATIONS

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

RIGHT OF WAY DATE:
JANUARY 31, 2018

LETTING DATE:
AUGUST 8, 2018

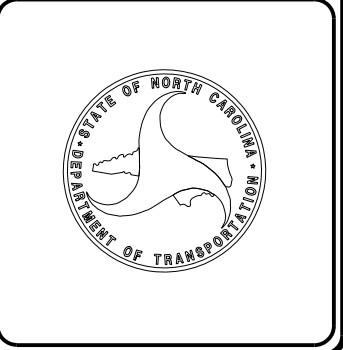
| |
|---|
| DOUGLAS WHEATLEY, PE PROJECT ENGINEER |
| MONICA J. DUVAL PROJECT DESIGN ENGINEER |
| HEATHER C. LANE, PE NCDOT CONTACT |

HYDRAULICS ENGINEER

SIGNATURE: _____ P.E.

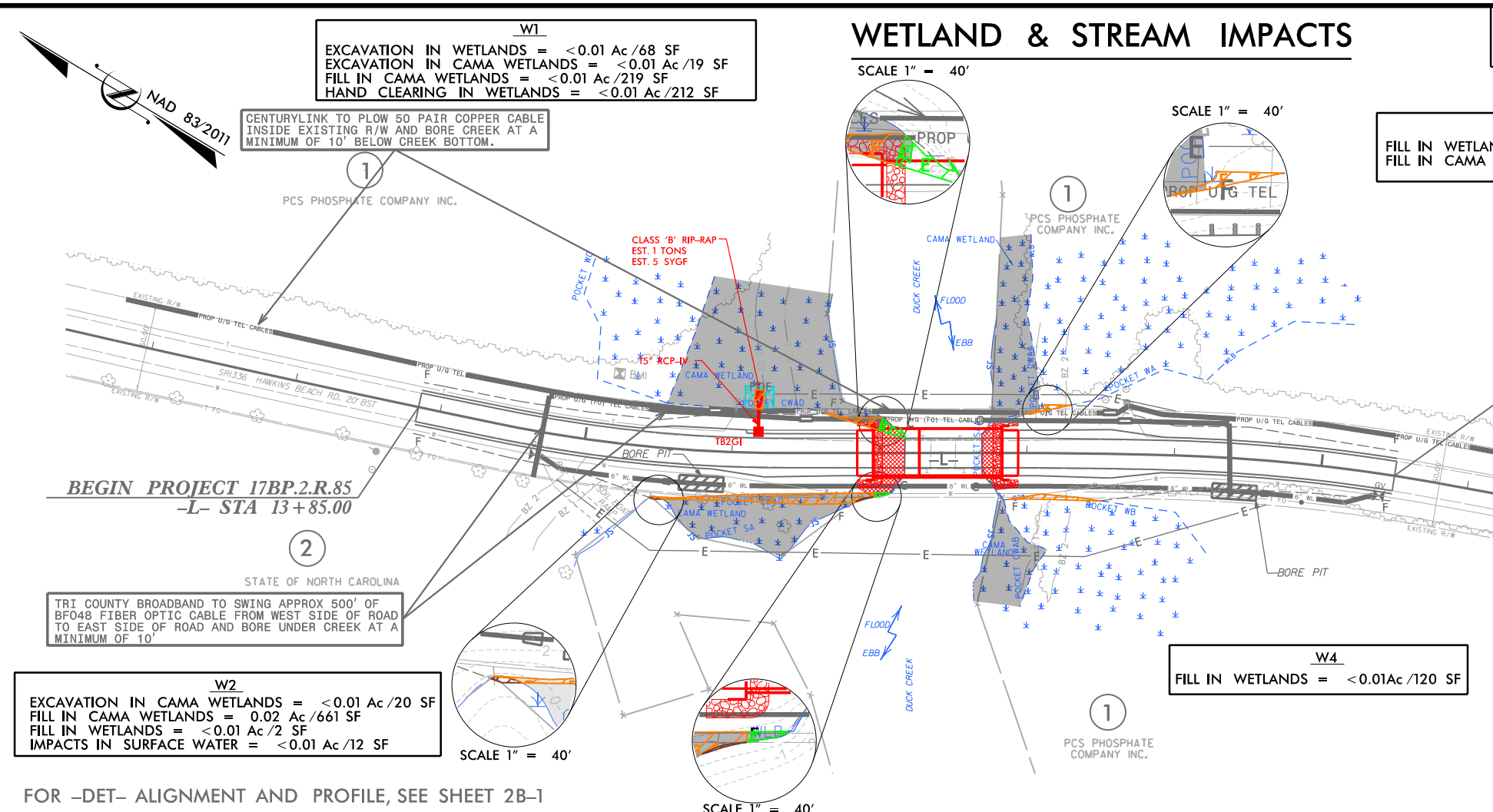
ROADWAY DESIGN ENGINEER

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6/5/2018
\\17BP.2.R.85_BP249_hyd_prm_tsh.dgn
HNTB

8/17/99

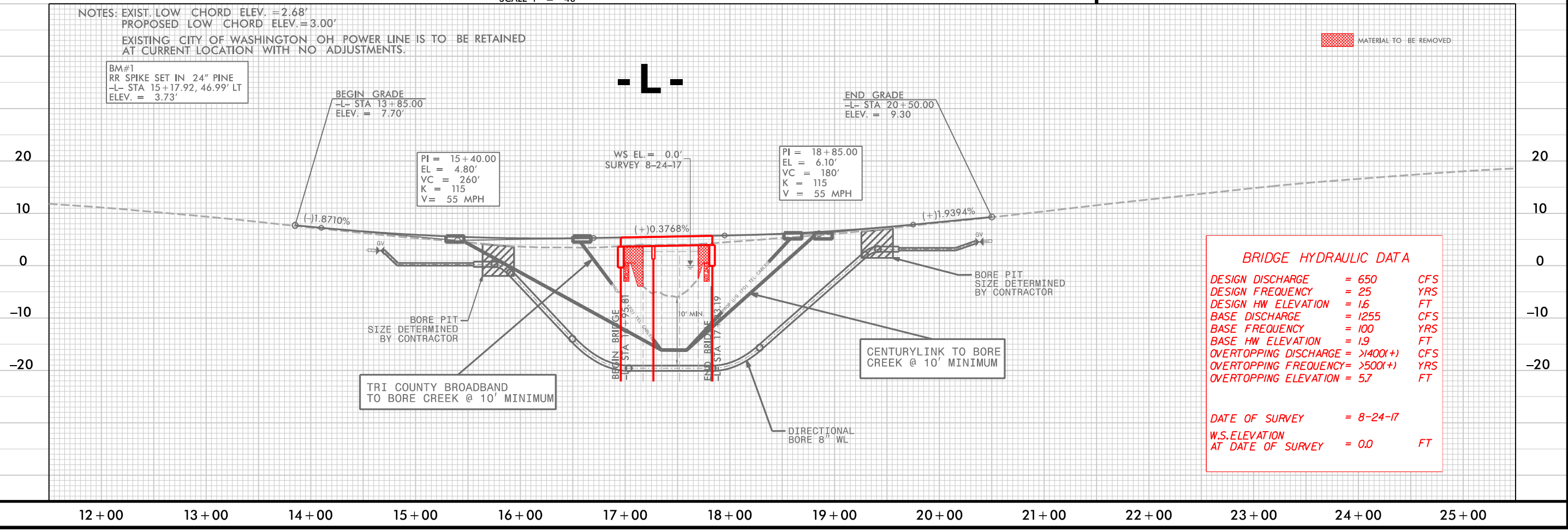


| | |
|---|-----------------------|
| PROJECT REFERENCE NO. 17BP.2.R.85 | SHEET NO. 4 |
| RW SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 2 OF 14

FOR -DET- ALIGNMENT AND PROFILE, SEE SHEET 2B-1



6/28/2018 17BP.2.R.85_BR249_hyd.pr.m.psh4.dgn

6/28/2018 17BP.2.R.85_BR249_hyd.pr.m.psh4.dgn

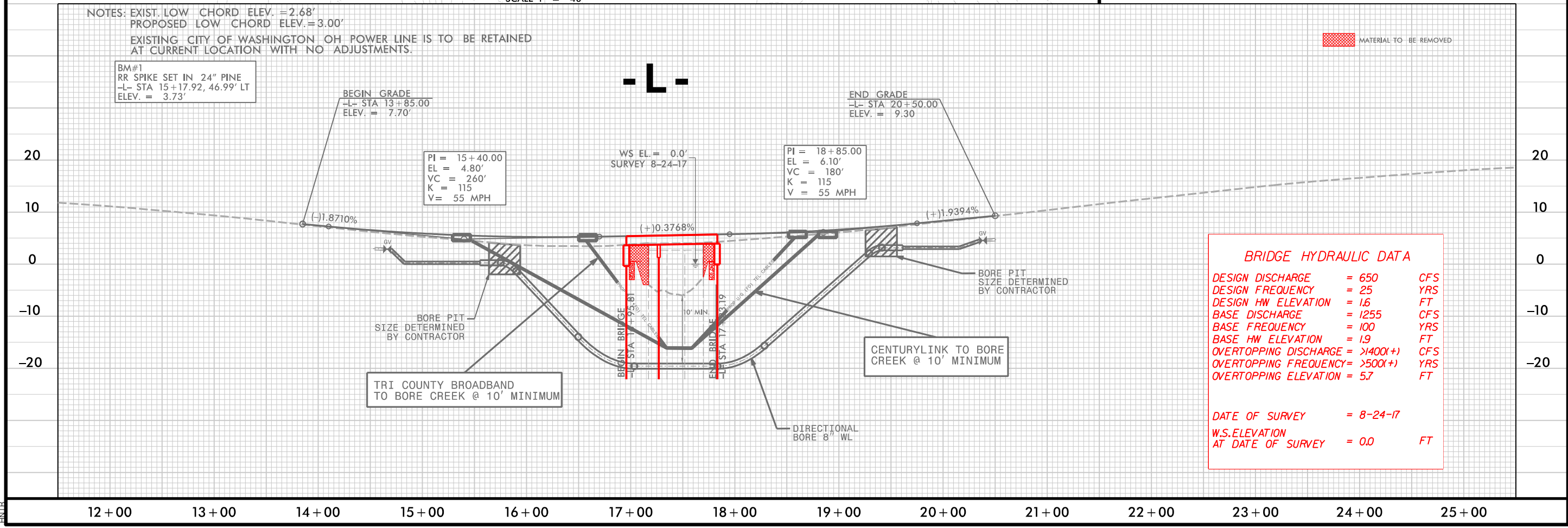
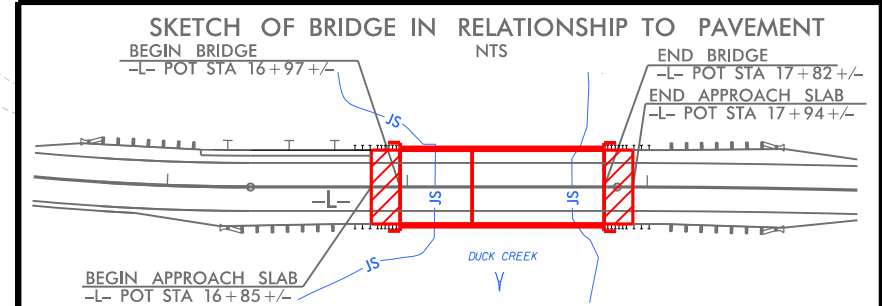
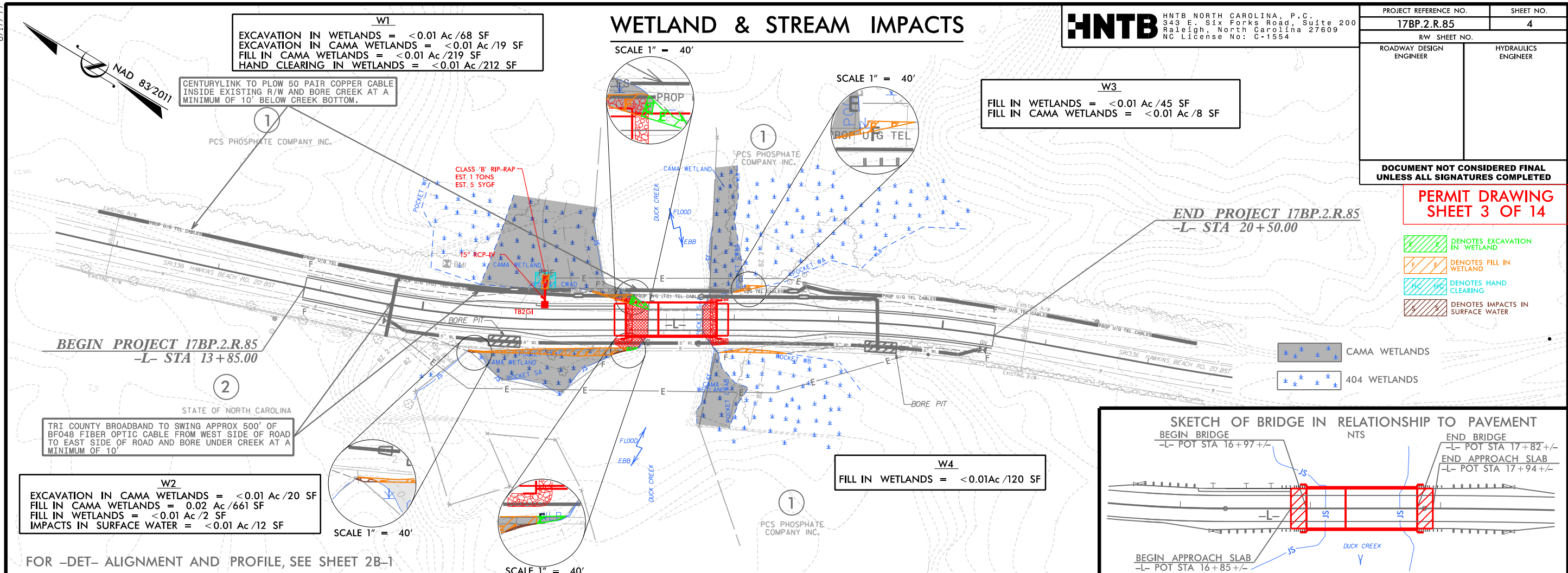
WETLAND & STREAM IMPACTS

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

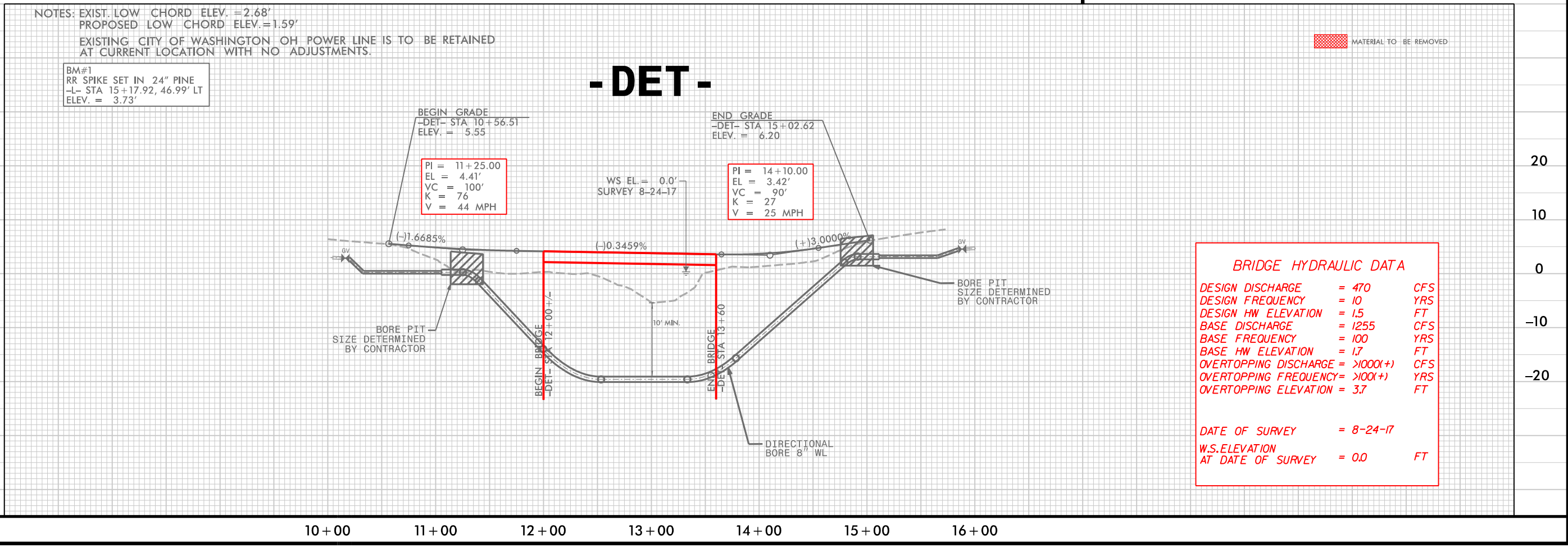
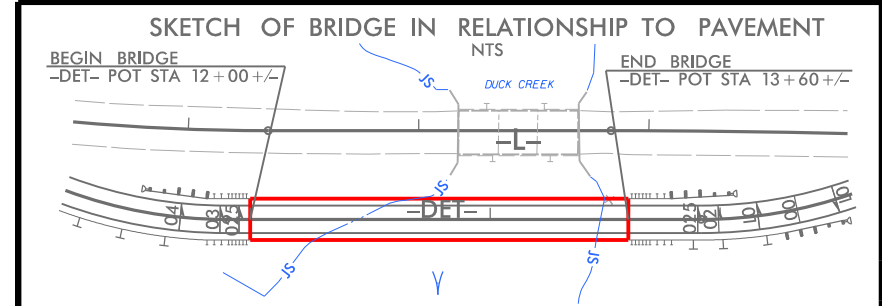
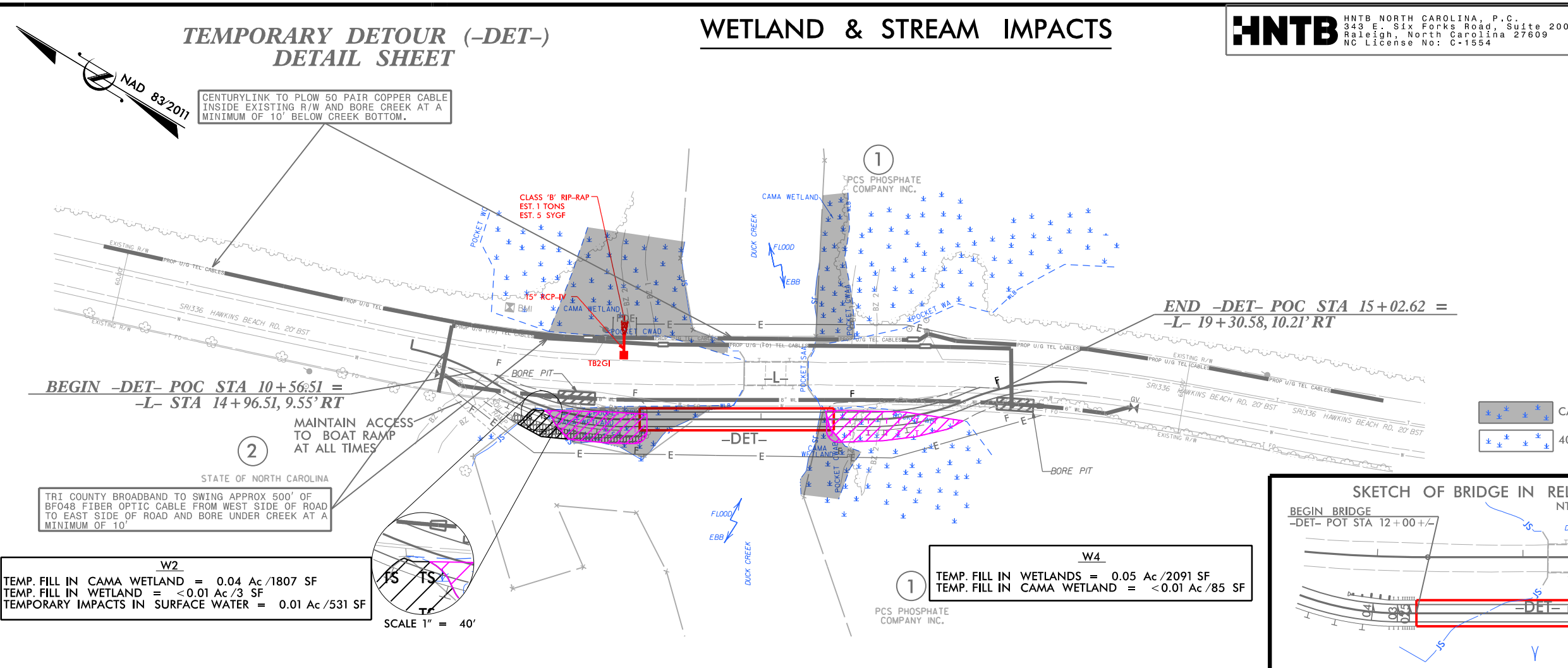
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| PROJECT REFERENCE NO. 17BP.2.R.85 | SHEET NO. 4 |
| RW SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

PERMIT DRAWING SHEET 3 OF 14



6/17/18 17BP.2.R.85_BR249_hyd_pr.m_psh4_detour.dgn



6/17/2018 17BP.2.R.85_BR249_hyd.pr.m.psh4_detour.dgn

TEMPORARY DETOUR (-DET-) DETAIL SHEET

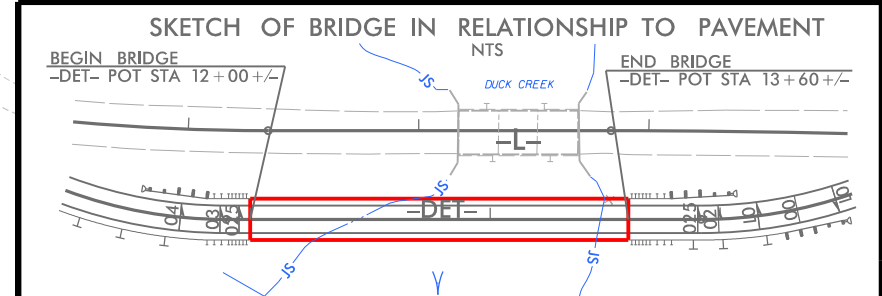
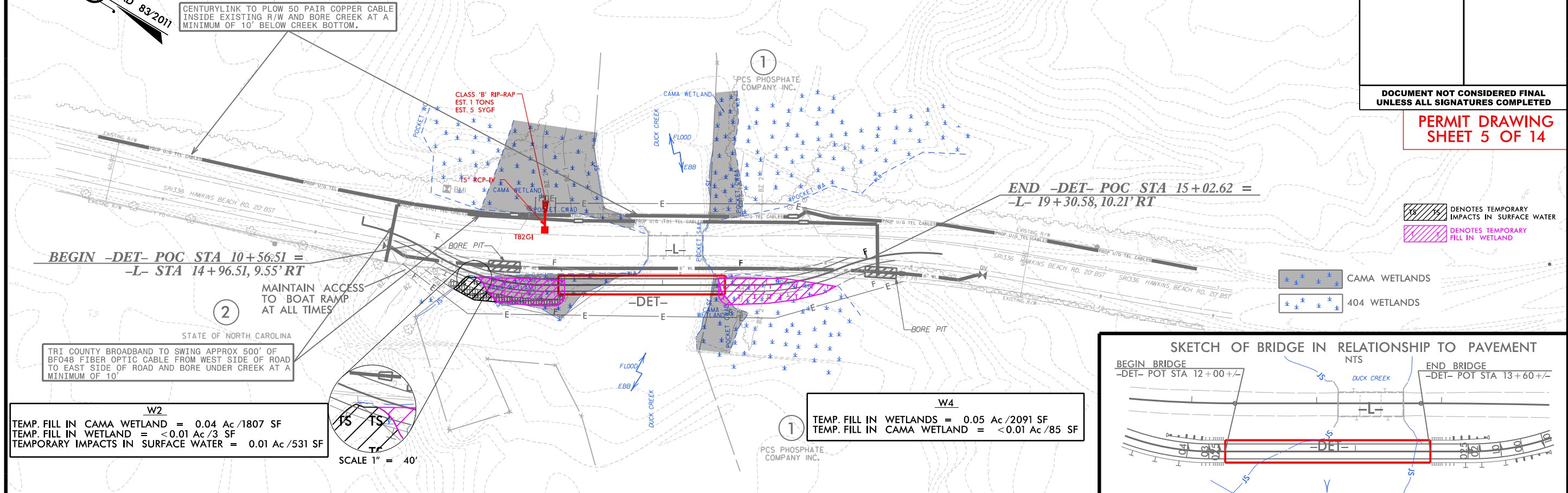
WETLAND & STREAM IMPACTS

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| | |
|---|--------------------------|
| PROJECT REFERENCE NO. 17BP.2.R.85 | SHEET NO. 2B-1 |
| RW SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

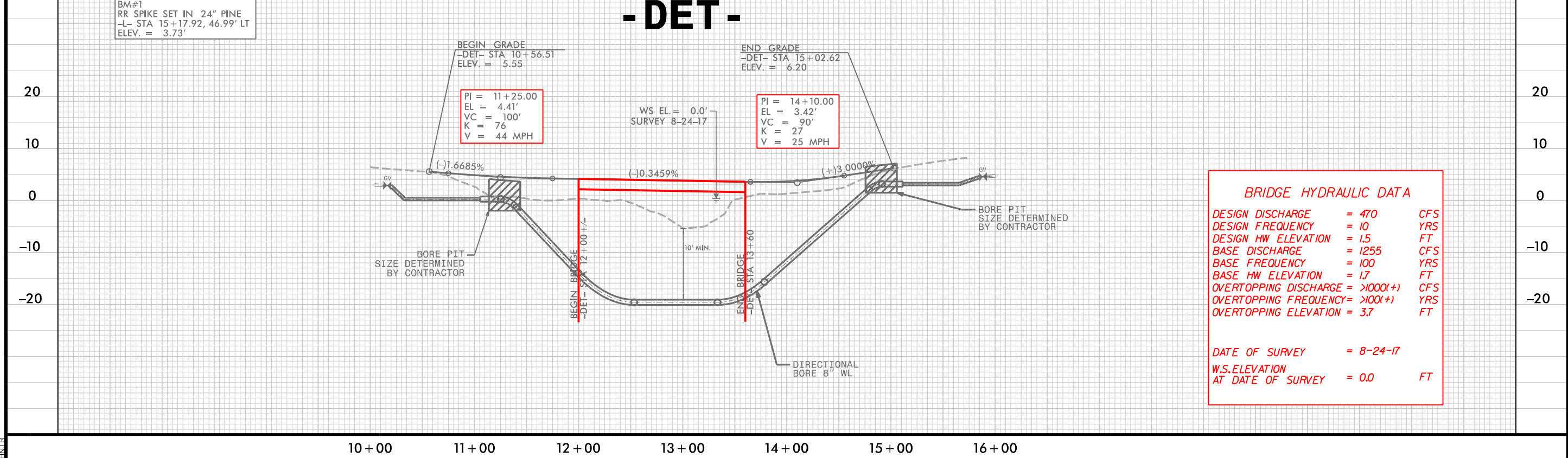
**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

**PERMIT DRAWING
SHEET 5 OF 14**



NOTES: EXIST. LOW CHORD ELEV. = 2.68'
 PROPOSED LOW CHORD ELEV. = 1.59'
 EXISTING CITY OF WASHINGTON OH POWER LINE IS TO BE RETAINED AT CURRENT LOCATION WITH NO ADJUSTMENTS.

BM#1
 RR SPIKE SET IN 24" PINE
 -L- STA 15+17.92, 46.99' LT
 ELEV. = 3.73'



6/28/2018 17BP.2.R.85_BR249_hyd_buff_psh4.dgn

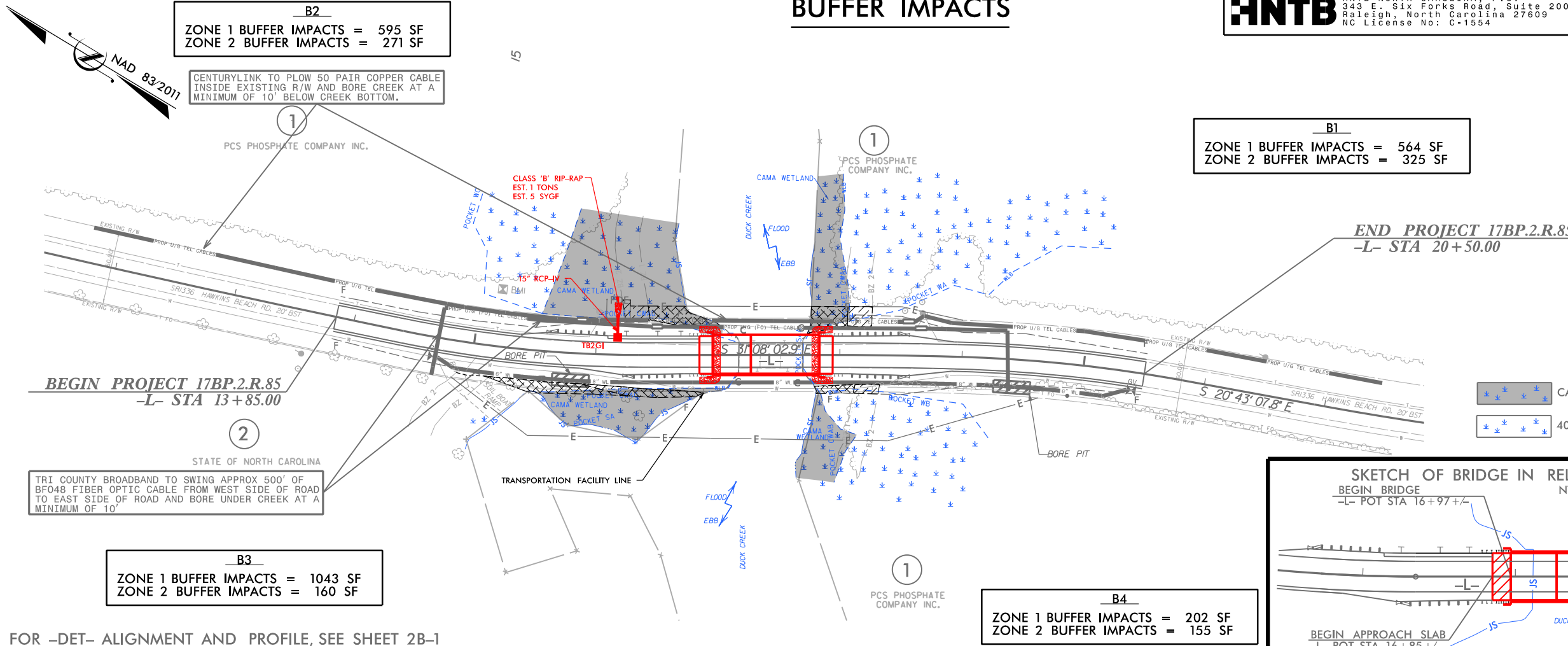
BUFFER IMPACTS

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

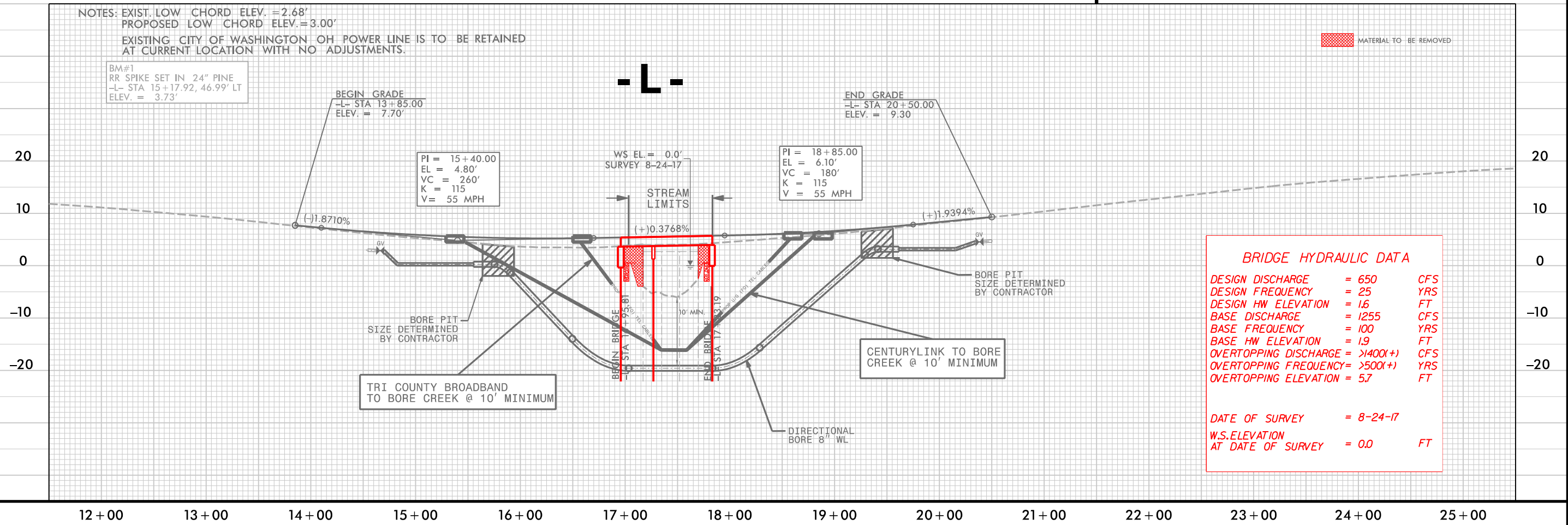
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| PROJECT REFERENCE NO. 17BP.2.R.85 | SHEET NO. 4 |
| RW SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

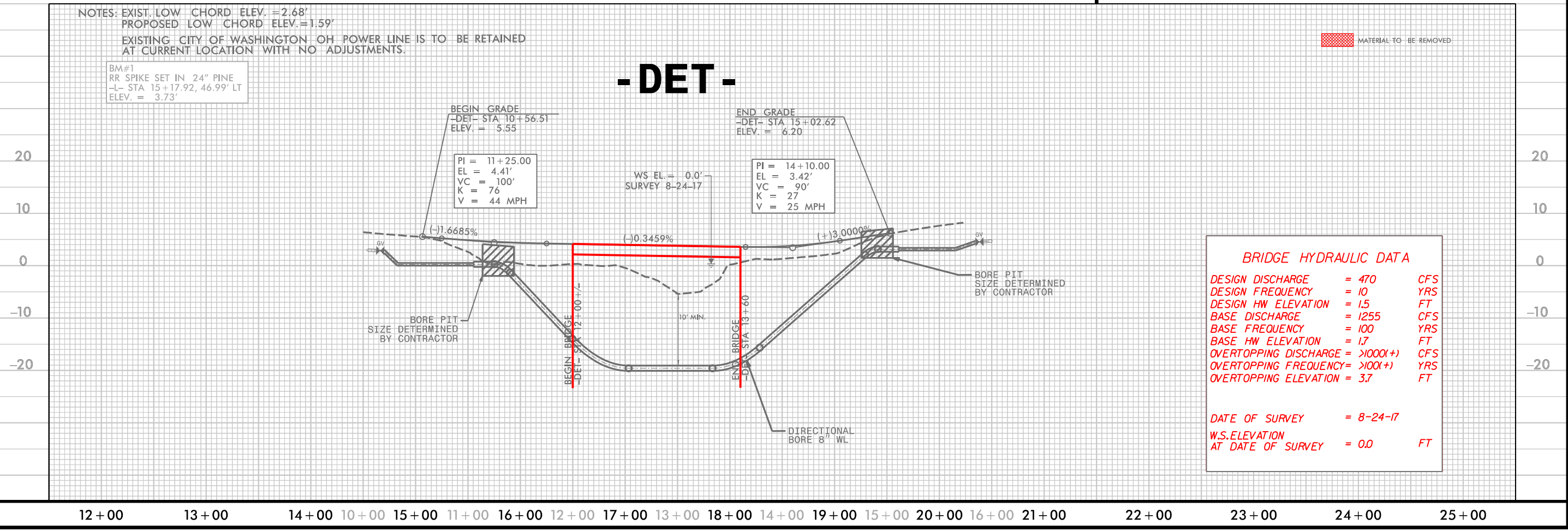
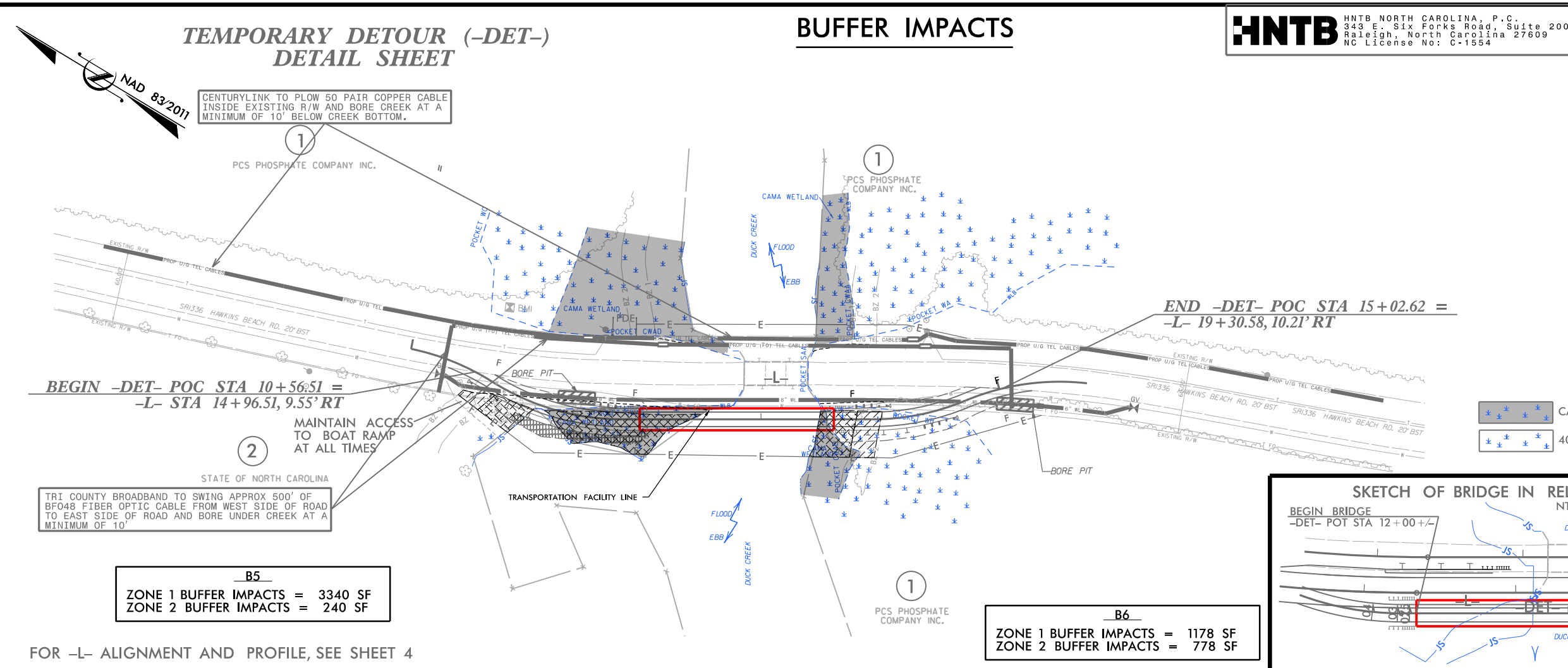
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SHEET 6 OF 14



FOR -DET- ALIGNMENT AND PROFILE, SEE SHEET 2B-1

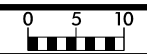


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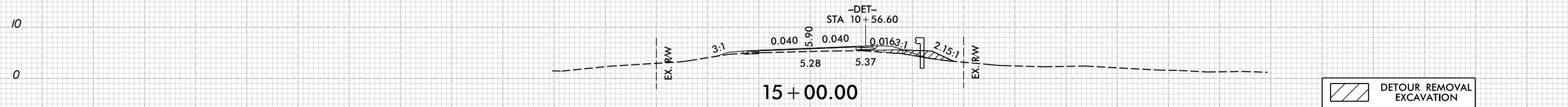


12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00 21+00 22+00 23+00 24+00 25+00

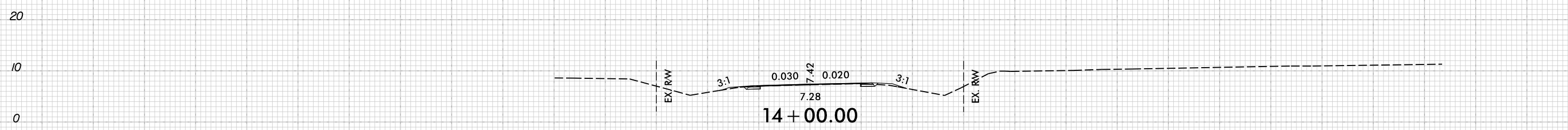
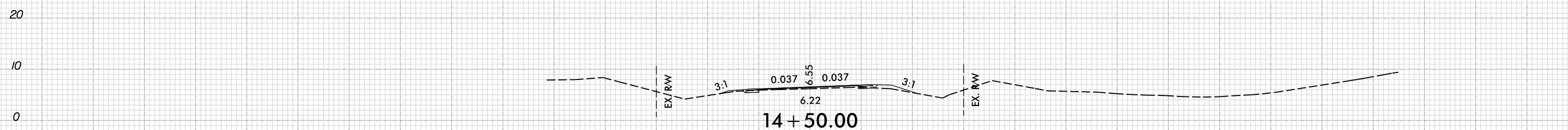
6/23/16



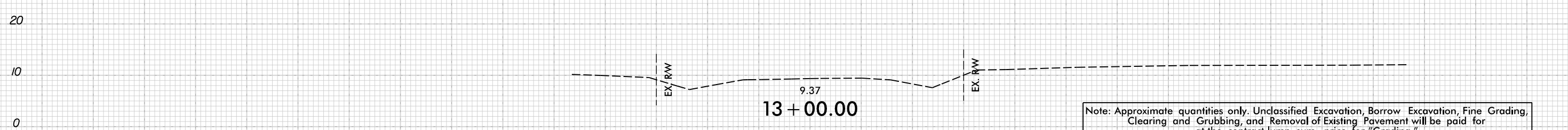
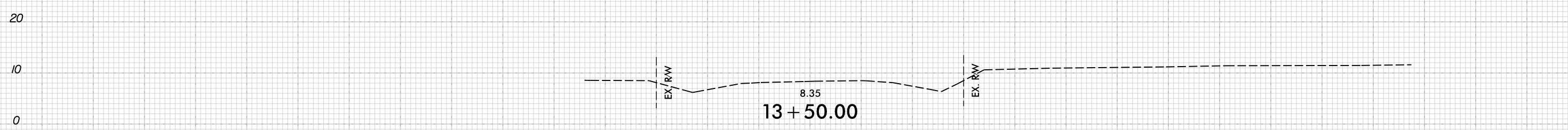
20 150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120



| | |
|--|------------------------------|
| | DETOUR REMOVAL EXCAVATION |
|--|------------------------------|



BEGIN GRADE
-L- STA 13 + 85.00



| |
|---|
| 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." |
|---|

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

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THB

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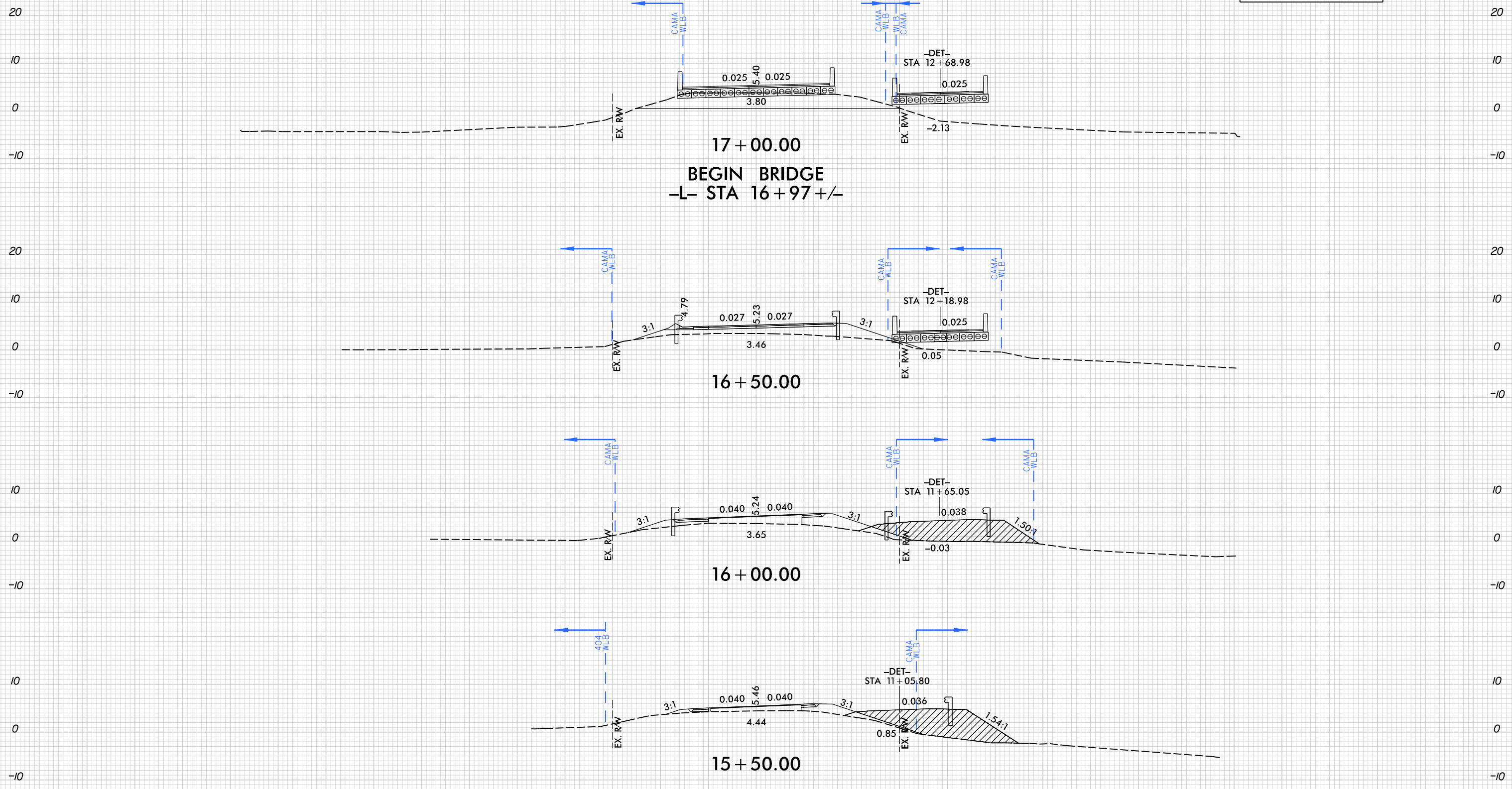


PROJ. REFERENCE NO.
17BP.2.R.85

SHEET NO.
X-2

PERMIT DRAWING
SHEET 9 OF 14

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

6/15/2016
17BP.2.R.85_BR249_HYD_prm_xpl.dgn
THB

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6/23/16

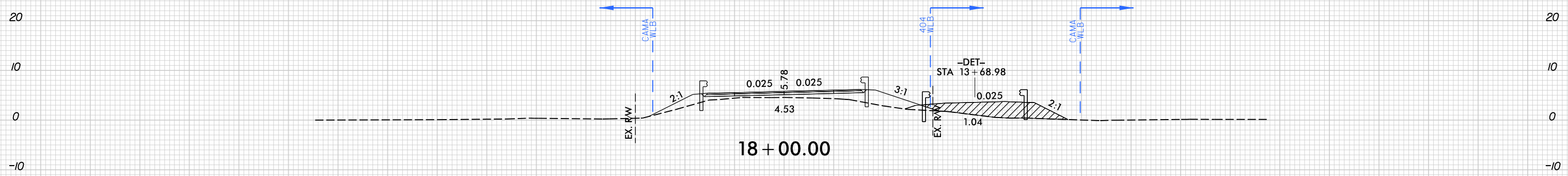
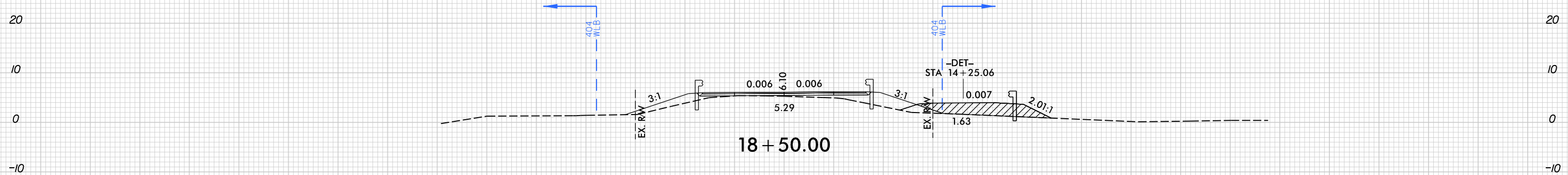
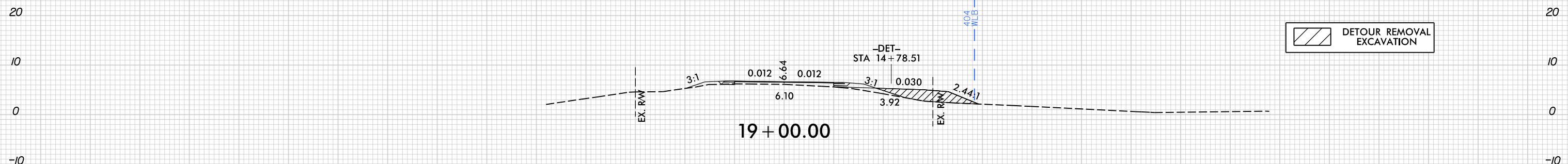


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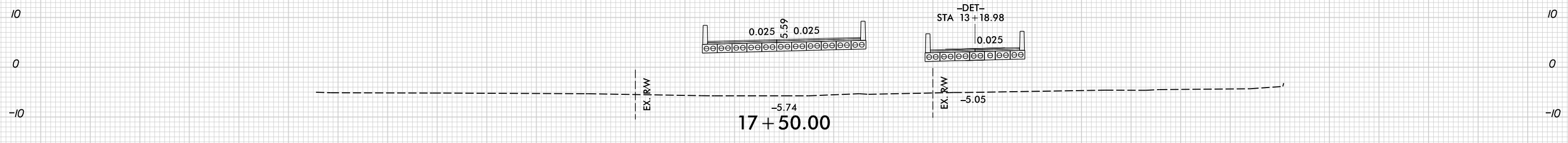
SHEET NO.
X-3

PERMIT DRAWING
SHEET 10 OF 14

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



END BRIDGE
-L- STA 17 + 82 +/-



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

6/15/2016
17BP.2.R.85_BR249_HYD_perm_xpl.dgn
THN

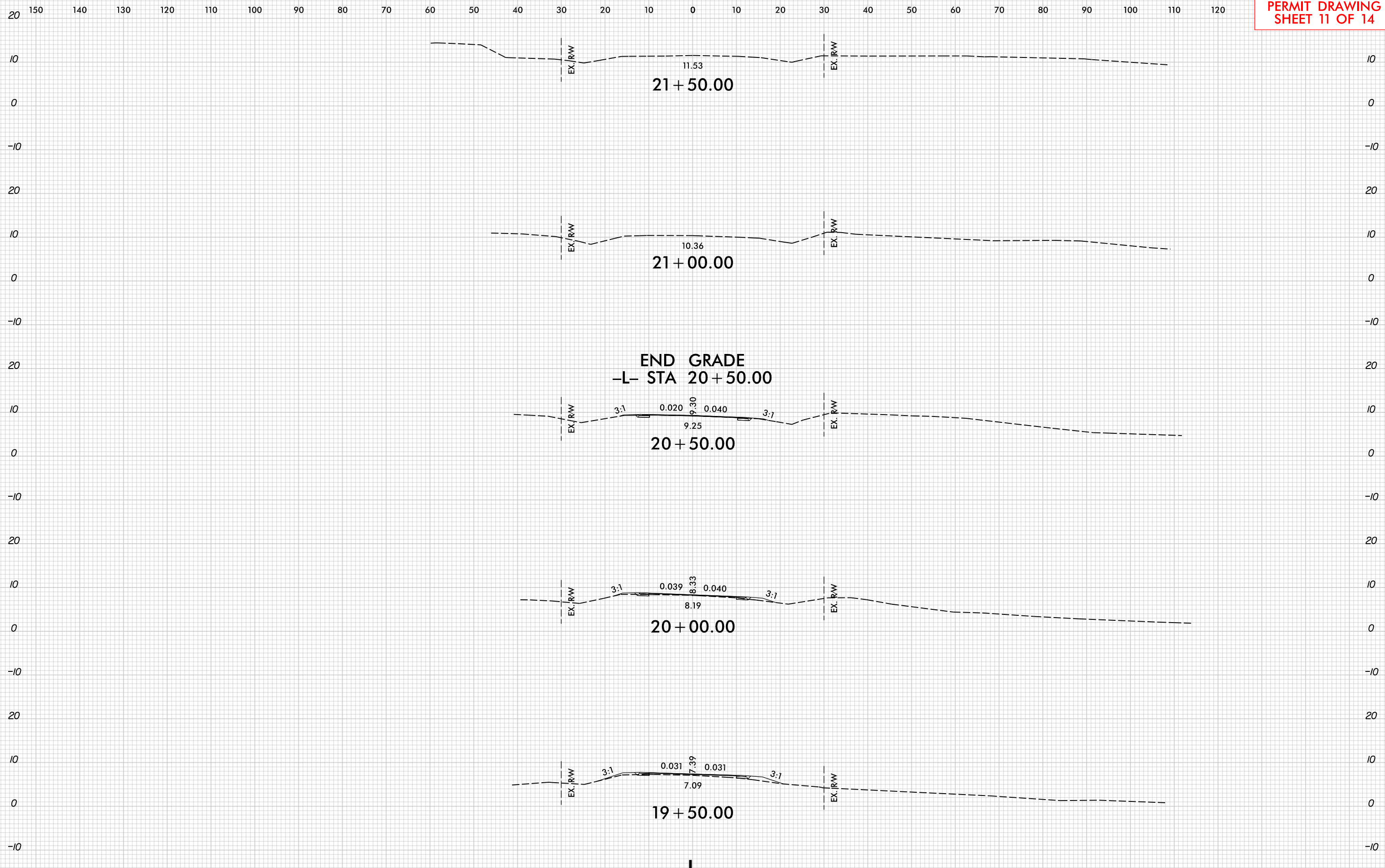
6/23/16



PROJ. REFERENCE NO.
17BP.2.R.85

SHEET NO.
X-4

PERMIT DRAWING
SHEET 11 OF 14



21 + 50.00

21 + 00.00

END GRADE
-L- STA 20 + 50.00

20 + 50.00

20 + 00.00

19 + 50.00

-L-

6/5/2016
17BP.2.R.85_BR245_HYD_perm_xpl.dgn
THB

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

WETLAND AND SURFACE WATER IMPACTS SUMMARY

| Site No. | 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 | -L- 16+63 to 19+03 | 21" Cored Slab Bridge | < 0.01 | | < 0.01 | | | < 0.01 | | | | |
| 1 | -L- 16+63 to 19+03 | 21" Cored Slab Bridge (CAMA) | 0.02 | | < 0.01 | | < 0.01 | | | | | |
| 1 | -DET- 10+57 to 15+03 | Temp. Bridge | | 0.05 | | | | | 0.01 | | | |
| 1 | -DET- 10+57 to 15+03 | Temp. Bridge (CAMA) | | 0.04 | | | | | | | | |
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| TOTALS*: | | | 0.02 | 0.09 | < 0.01 | 0.00 | < 0.01 | < 0.01 | 0.01 | 0 | 0 | 0 |

*Rounded totals are sum of actual impacts

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

Permanent Fill in Wetlands: 167 SF
 Permanent Fill in Wetlands (CAMA): 888 SF
 Temporary Fill in Wetlands: 2094 SF
 Temporary Fill in Wetlands (CAMA): 1892 SF
 Excavation in Wetlands: 68 SF
 Excavation in Wetlands (CAMA): 39 SF
 Hand Clearing in Wetlands (CAMA): 212 SF
 Permanent Impacts in Surface Water: 12 SF
 Temporary Impacts in Surface Water: 531 SF

NC DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 6/28/2018
 Beaufort County BRIDGE NO. 249
 17BP.2.R.85

SHEET 12 OF 14

Revised 2016 09 09

RIPARIAN BUFFER IMPACTS SUMMARY

| SITE NO. | STRUCTURE SIZE / TYPE | STATION (FROM/TO) | IMPACT | | | | | | | | | BUFFER REPLACEMENT | |
|---------------|-----------------------|-----------------------|---------------|--------|-----------------|---------------------------|---------------------------|--------------------------|---------------------------|---------------------------|--------------------------|---------------------------|---------------------------|
| | | | TYPE | | | ALLOWABLE | | | MITIGABLE | | | ZONE 1 (ft ²) | ZONE 2 (ft ²) |
| | | | 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) | | |
| B1 | 21" Cored Slab Bridge | -L- 17+73 to 18+26 LT | | X | | 564 | 325 | 889 | | | | | |
| B2 | 21" Cored Slab Bridge | -L- 16+21 to 17+02 LT | | X | | 595 | 271 | 866 | | | | | |
| B3 | 21" Cored Slab Bridge | -L- 15+11 to 16+88 RT | | X | | 1043 | 160 | 1203 | | | | | |
| B4 | 21" Cored Slab Bridge | -L- 17+78 to 18+33 RT | | X | | 202 | 155 | 357 | | | | | |
| B5 | DETOUR BRIDGE | -L- 14+86 to 16+82 RT | | X | | 3340 | 240 | 3580 | | | | | |
| B6 | DETOUR BRIDGE | -L- 17+70 to 18+31 RT | | X | | 1178 | 778 | 1956 | | | | | |
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| TOTAL: | | | | | | 6922 | 1929 | 8851 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

N.C. DEPT. OF TRANSPORTATION
 DIVISION OF HIGHWAYS

 BEAUFORT COUNTY BRIDGE NO. 249
 17BP.2.R.85

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WETLANDS IN BUFFER IMPACTS SUMMARY

| SITE NO. | STATION (FROM/TO) | WETLANDS IN BUFFERS | |
|---------------|------------------------------|------------------------------|------------------------------|
| | | ZONE 1 (ft ²) | ZONE 2 (ft ²) |
| B1 | -L- 17+73 to 18+26 LT (CAMA) | 451 | 21 |
| B1 | -L- 17+73 to 18+26 LT (404) | 1 | 180 |
| B2 | -L- 16+21 to 17+02 LT (CAMA) | 549 | 233 |
| B3 | -L- 15+11 to 16+88 RT (CAMA) | 489 | 72 |
| B4 | -L- 17+78 to 18+33 RT (404) | 42 | 56 |
| B5 | -L- 14+86 to 16+82 RT (CAMA) | 2627 | 0 |
| B6 | -L- 17+70 to 18+31 RT (CAMA) | 650 | 50 |
| B6 | -L- 17+70 to 18+31 RT (404) | 528 | 728 |
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| TOTAL: | | 5337 | 1340 |

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