



STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION

ROY COOPER  
GOVERNOR

J. ERIC BOYETTE  
SECRETARY

March 12, 2020

US Army Corps of Engineers  
2407 West 5<sup>th</sup> Street  
Washington, North Carolina 27889-1000

Attention: Mr. Tom Steffens  
NCDOT Coordinator

Dear Sir:

**Subject: Application for Modifications to Section 404 Individual Permit and Section 401 Water Quality Certification** for the proposed Havelock Bypass in Craven County. TIP No. R-1015. WBS 34360.1.2

The North Carolina Department of Transportation (NCDOT) obtained Section 404 CWA authorization and Section 401 Water Quality Certification to construct a new US 70 bypass of Havelock, North Carolina in Craven County under Corps Action ID: SAW-1993-02466 and NCDWR Project No. 20181598 in April 2019. Since that time, several design details have changed, and the permits need to be modified accordingly. The purpose of this letter is to provide modified permit drawings that depict these changes.

Wetland and Stream Impacts:

These changes reflect both roadway design changes and changes in accommodations for Duke Energy. Coordination with Duke Energy resulted in a reduction in the number of access points to their transmission lines, and a reduction in impacts.

- Detail sheets updated (permit drawings 2 & 3)
- Site 1 (permit sheets 17&18) added riprap in the excavation area due to riprap pads at two pipes. A driveway was added, which did increase the impacts from fill, but decreased the mechanized clearing and excavation. The permitted total (1.16 acre) did not change.
- Site 3 (permit sheets) impacts increased from 29.33 to 29.42 acre (a change of 0.09) due to driveway changes and an error in the previous calculation.
- Update to permit sheets 124 & 125. Changes were outside of impacted areas
- Update to permit sheets 130 & 131. Changes were outside of impacted areas
- Site 47, (permit sheets 142 & 143) pipe shortened to eliminate easement on property, HW added. "Temporary Impacts in Surface Water" reduced by 0.01 ac. "Existing Channel Impacts Temp." reduced by 10'.

- Site 21 (permit sheets 148 & 149) pipe outlet shifted. Fill increased, excavation decreased, no change to total impacts permitted for site (0.85 acre).
- Summary sheets are updated to reflect changes to impacts and date (permit sheets 165, 166 & 167). Permanent fill in wetlands is increased slightly from 98.66 to 98.75 acres. Mechanized clearing is reduced from 11.43 to 11.38 acres. Changes at Site 47 caused reductions in temporary surface water and temporary channel impacts.
- Additional sheets have been prepared for the underground utility which requires additional impacts in wetland Sites 1, 2 and 3. The permit drawings showed underground utilities through these sections, but with no splice pits or hand holes, which are required. These supplemental drawings were revised by Division 2 to show the permanent hand holes and temporary splice pits with the total impacts required. These totals are not included in the summary sheet prepared by Hydraulics Unit. Impacts shown on the supplemental permit drawings are as follows:
  - = NE-03, 400 s.f. for splice pits and 15 s.f. for hand holes
  - = NE-04, 500 s.f. for splice pits and 30 s.f. for hand holes
  - = NE-05, 600 s.f. for splice pits and 30 s.f. for hand holes
  - = Additional total impacts needed = 1,575 s.f. (0.036 acre) of handclearing for bore holes.

The net increase in permanent wetland impacts from these changes is approximately 0.04 acre. An updated mitigation acceptance letter will be forwarded as soon as it is available.

Buffer Impacts:

- Site 7 (buffer sheet 13) reduced Allowable Zone 1 impacts by 281 s.f. The pipe was shortened to eliminate easement on property, and a headwall added.
- Summary updated (buffer sheet 18 & 19). Allowable Zone 1 impacts are reduced from 42,810 s.f. to 42,529 s.f. due to the changes at Site 7.

A copy of this modification request and its distribution list will be posted on the NCDOT website at: <https://xfer.services.ncdot.gov/pdea/PermApps/>

Thank you for your assistance with this project. If you have any questions or need additional information, please contact Gordon Cashin at [gcashin@ncdot.gov](mailto:gcashin@ncdot.gov) or (919) 707-6107.

Sincerely,

DocuSigned by:

*Mack C. Rivenbark III*

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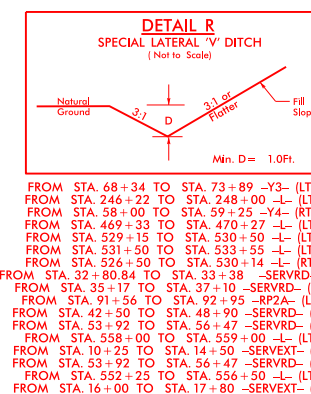
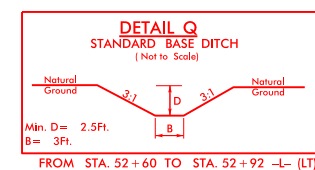
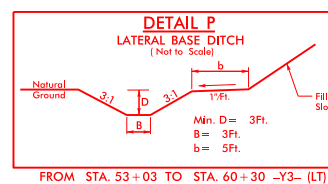
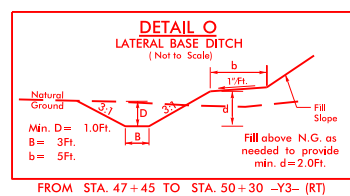
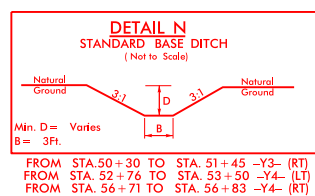
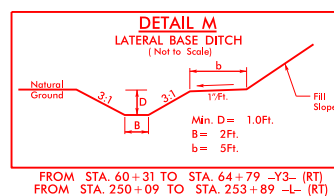
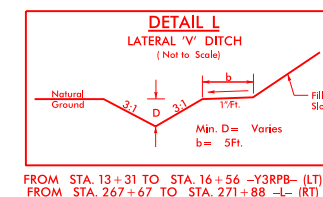
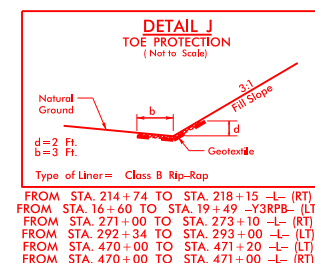
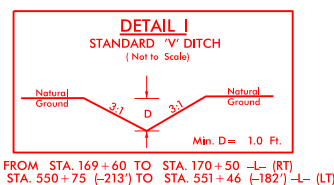
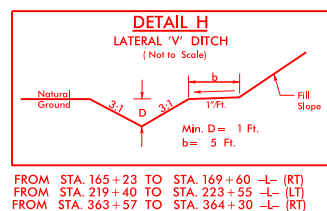
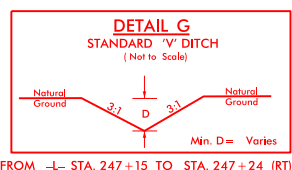
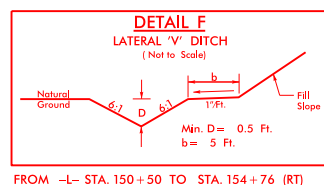
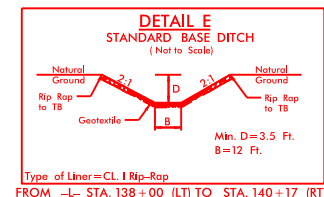
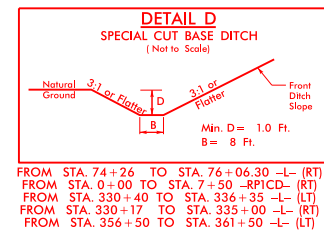
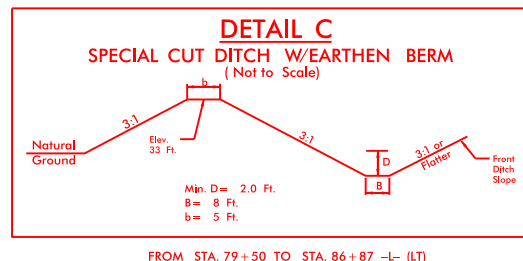
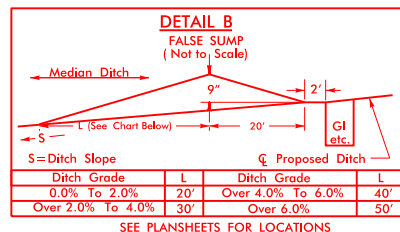
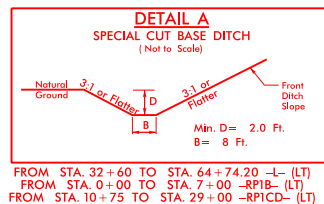
for Philip S. Harris III, P.E., C.P.M., Unit Head  
Environmental Analysis Unit

cc: NCDOT Permit Application Standard Distribution List

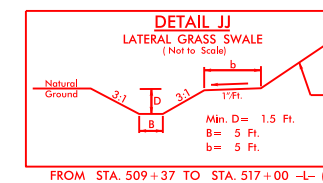
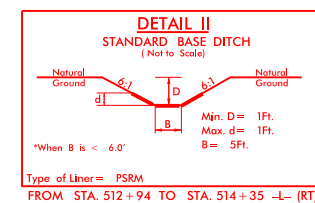
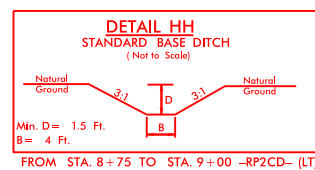
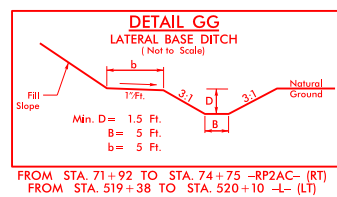
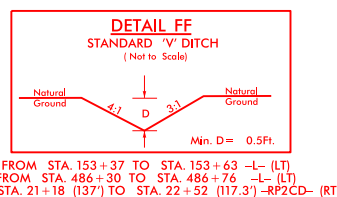
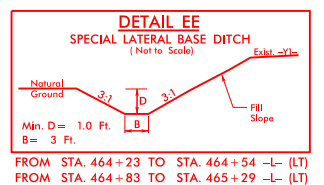
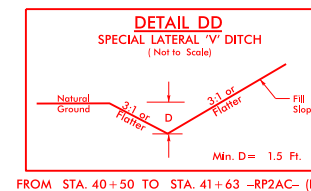
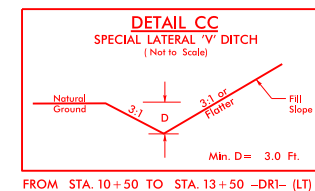
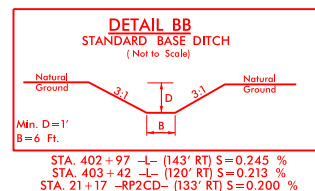
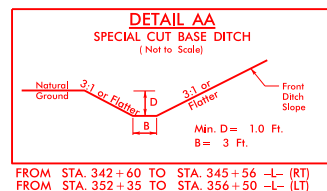
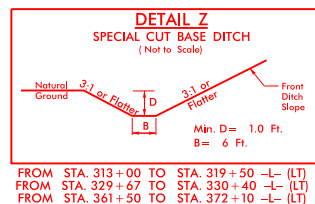
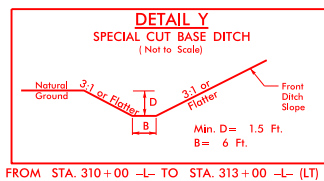
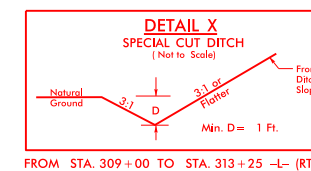
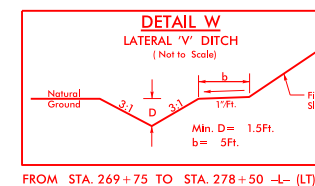
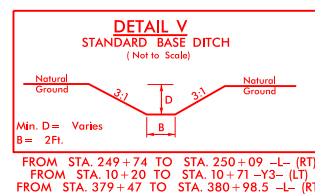
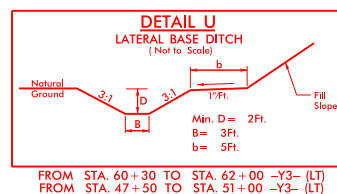
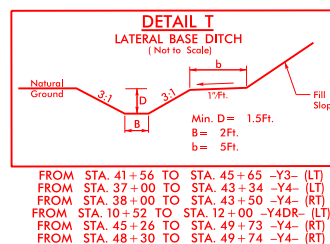
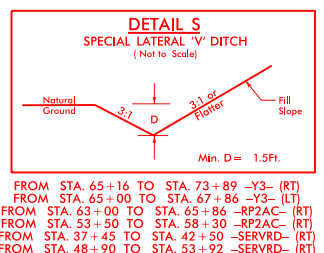
# Details

PROJECT REFERENCE NO.	SHEET NO.
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION	

**PERMIT DRAWING**  
**SHEET 2 OF 167**



## WETLAND AND SURFACE WATER IMPACTS PERMIT



PROJECT REFERENCE NO.	SHEET NO.
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION	

# Details (cont.)

**PERMIT DRAWING**  
**SHEET 3 OF 167**

**DETAIL KK**  
SPECIAL LATERAL BASE DITCH  
(Not to Scale)

FROM STA. 9+00 TO STA. 11+65 -RP2CD- (LT)  
FROM STA. 563+25 TO STA. 565+50 -L- (LT)

**DETAIL LL**  
STANDARD 'V' DITCH  
(Not to Scale)

FROM STA. 90+41 -RP2A- (LT)  
FROM STA. 12+15 TO STA. 12+89 -RP2CD- (RT)  
FROM STA. 534+65 TO STA. 535+02 -L- (LT)  
FROM STA. 536+53 TO STA. 536+74 -L- (LT)  
FROM STA. 536+83 TO STA. 537+43 -L- (LT)

**DETAIL MM**  
STANDARD 'V' DITCH  
(Not to Scale)

FROM STA. 11+66 TO STA. 12+05 -RP2CD- (LT)

**DETAIL NN**  
MEDIAN 'V' DITCH  
(Not to Scale)

FROM STA. 162+00 TO STA. 167+00 -L- (MED)  
FROM STA. 224+00 TO STA. 226+26 -L- (MED)  
FROM STA. 434+50 TO STA. 450+50 -L- (MED)  
FROM STA. 530+14 TO STA. 536+00 -L- (RT)  
FROM STA. 537+00 TO STA. 579+00 -L- (RT)  
FROM STA. 555+00 TO STA. 559+50 -L- (MED)  
FROM STA. 566+47 TO STA. 575+00 -L- (MED)  
FROM STA. 575+00 TO STA. 579+17.51 -L- (MED)

**DETAIL OO**  
STANDARD 'V' DITCH  
(Not to Scale)

FROM STA. 533+55 -L- (LT) S=6.8 %

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

FROM STA. 559+00 TO STA. 562+50 -L- (LT)

**DETAIL QQ**  
SPECIAL LATERAL BASE DITCH  
(Not to Scale)

FROM STA. 544+00 TO STA. 552+25 -L- (LT)  
FROM STA. 562+50 TO STA. 563+25 -L- (LT)

**DETAIL RR**  
LATERAL BASE DITCH  
(Not to Scale)

FROM STA. 53+50 TO STA. 54+50 -Y4- (LT)  
STA. 11+00 -SERVEXT- S=0.286 %

**DETAIL SS**  
SPECIAL LATERAL BASE DITCH  
(Not to Scale)

FROM STA. 34+57 TO STA. 41+17 -Y3- (LT)  
FROM STA. 543+00 TO STA. 544+00 -L- (LT)

**DETAIL TT**  
SPECIAL LATERAL BASE DITCH  
(Not to Scale)

FROM STA. 34+57 TO STA. 37+79 -Y3- (RT)

**DETAIL UU**  
SPECIAL LATERAL BASE DITCH  
(Not to Scale)

FROM STA. 38+60 TO STA. 41+50 -Y3- (RT)

**DETAIL WW**  
SPECIAL LATERAL BASE DITCH  
(Not to Scale)

FROM STA. 34+23 TO STA. 37+00 -Y4- (LT)  
FROM STA. 34+47 TO STA. 38+00 -Y4- (RT)  
FROM STA. 12+00 TO STA. 15+70 -Y4DR- (LT)  
FROM STA. 12+00 TO STA. 15+70 -Y4DR- (LT)

**DETAIL XX**  
PIPE INLET CHANNEL AND BANK STABILIZATION  
(Not to Scale)

Length = 25Ft.  
Est. = 20 Tons of Class I Rip-Rap  
STA. 51+65 -Y4- (LT)

**DETAIL YY**  
PIPE OUTLET CHANNEL  
(Not to Scale)

Length = 30Ft.  
Est. = 100 Tons of Class I Rip-Rap  
STA. 52+38 -Y4- (RT)

**DETAIL ZZ**  
DITCH BLOCK  
(Not to Scale)

FROM STA. 58+77 -Y4- (LT)

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

FROM STA. 41+63 TO STA. 48+50 -RP2AC- (RT)

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

FROM STA. 341+50 -L- TO STA. 347+63 -L- (LT)

**DETAIL DDD**  
LATERAL BASE DITCH  
(Not to Scale)

FROM STA. 7+27 TO STA. 8+36 -RP2C- (RT)

**DETAIL EEE**  
STANDARD BASE DITCH  
(Not to Scale)

FROM STA. 6+14 TO STA. 7+27 -RP2C- (RT)  
STA. 72+02 TO STA. 72+50 -RP2AC- (RT)

**DETAIL FFF**  
STANDARD BASE DITCH  
(Not to Scale)

FROM STA. 34+12 TO STA. 34+47 -Y4- (RT)

**DETAIL GGG**  
SPECIAL LATERAL BASE DITCH  
(Not to Scale)

FROM STA. 54+50 TO STA. 58+66 -Y4- (LT)

**DETAIL HHH**  
SPECIAL LATERAL BASE DITCH  
(Not to Scale)

FROM STA. 56+83 TO STA. 58+00 -Y4- (RT)

**DETAIL MMM**  
SPECIAL CUT BASE DITCH  
(Not to Scale)

FROM STA. 33+48 TO STA. 36+78 -RP1CD- (RT)

**DETAIL NNN**  
SPECIAL CUT BASE DITCH  
(Not to Scale)

FROM STA. 28+39.21 TO STA. 30+00 -RP1AB- (RT)  
FROM STA. 36+78 TO STA. 36+93.06 -RP1CD- (RT)

**DETAIL OOO**  
SPECIAL CUT BASE DITCH  
(Not to Scale)

FROM STA. 12+50 TO STA. 33+48 -RP1CD- (RT)  
FROM STA. 0+00 TO STA. 0+55 -RP1A- (RT)  
FROM STA. 22+04.84 TO STA. 28+50 -RP1AB- (LT)

**DETAIL PPP**  
SPECIAL CUT BASE DITCH  
(Not to Scale)

FROM STA. 7+50 TO STA. 12+50 -RP1CD- (RT)

**DETAIL QQQ**  
MEDIAN 'V' DITCH  
(Not to Scale)

-RP1AB- FROM STA. 20+50 TO STA. 22+70 -RP1AB- (MED)

**DETAIL RRR**  
SPECIAL CUT BASE DITCH  
(Not to Scale)

FROM STA. 32+60 TO STA. 74+26 -L- (RT)

**DETAIL SSS**  
SPECIAL LATERAL BASE DITCH  
(Not to Scale)

FROM STA. 62+00 TO STA. 65+00 -Y3- (LT)

**DETAIL T1**  
TEMP. SPECIAL LATERAL 'V' DITCH  
(Not to Scale)

FROM STA. 42+50 TO STA. 51+13 -Y3DET- (RT)  
FROM STA. 55+00 TO STA. 59+50 -Y3DET- (RT)  
FROM STA. 38+25 TO STA. 40+25 -Y4DET- (LT)  
FROM STA. 54+00 TO STA. 55+00 -Y4DET- (LT)

**DETAIL T2**  
TEMP. SPECIAL LATERAL 'V' DITCH  
(Not to Scale)

FROM STA. 50+50 TO STA. 52+99 -Y3DET- (LT)  
FROM STA. 54+50 TO STA. 61+00 -Y3DET- (LT)  
FROM STA. 34+52 TO STA. 38+78 -Y4DET- (RT)

**DETAIL T3**  
TEMP. SPECIAL LATERAL 'V' DITCH  
(Not to Scale)

FROM STA. 68+42 TO STA. 69+16 -Y3DET- (LT)  
FROM STA. 66+50 TO STA. 69+16 -Y3DET- (RT)

**DETAIL T4**  
TEMP. SPECIAL LATERAL 'V' DITCH  
(Not to Scale)

FROM STA. 53+10 TO STA. 54+50 -Y3DET- (LT)  
FROM -Y3DET- STA. 61+00 TO STA. 67+93 (LT)

**DETAIL T7**  
SPECIAL LATERAL BASE DITCH  
(Not to Scale)

FROM STA. 36+29 TO STA. 40+50 -Y3DET- (LT)

**DETAIL T8**  
TEMP. SPECIAL LATERAL 'V' DITCH  
(Not to Scale)

FROM STA. 55+00 TO STA. 55+75 -Y4DET- (LT)

**DETAIL T10**  
TEMP. SPECIAL LATERAL 'V' DITCH  
(Not to Scale)

FROM STA. 61+21 TO STA. 64+50 -Y3DET- (RT)

# WETLAND AND SURFACE WATER IMPACTS PERMIT

REVISIONS

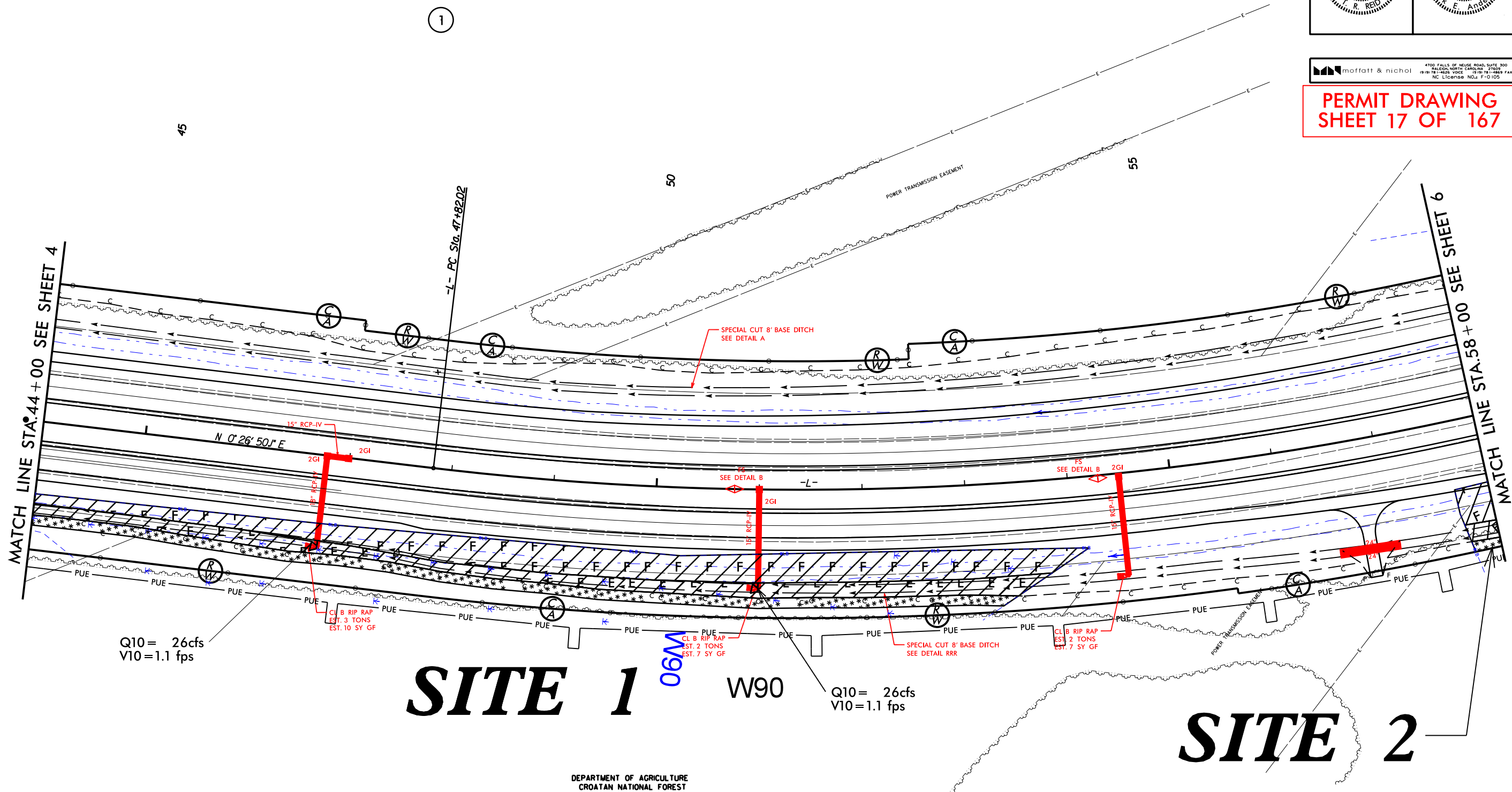
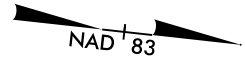
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PROJECT REFERENCE NO. R-1015	SHEET NO. 5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 015869 T. A. REID	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 032581 E. A. REID

4700 FALLS OF NEUSE ROAD, SUITE 300  
RALEIGH, NORTH CAROLINA 27609  
919/781-4625 VOICE 919/781-4625 FAX  
NC LICENSE NO. F-0105

**PERMIT DRAWING  
SHEET 17 OF 167**

DEPARTMENT OF AGRICULTURE  
CROATAN NATIONAL FOREST



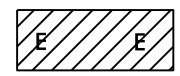
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V10 = 1.1 fps

Q10 = 26cfs  
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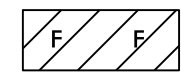
**SITE 1**

**SITE 2**

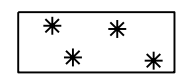
DEPARTMENT OF AGRICULTURE  
CROATAN NATIONAL FOREST



DENOTES EXCAVATION  
IN WETLAND



DENOTES FILL IN  
WETLAND



DENOTES MECHANIZED  
CLEARING

REVISIONS  
11/13/2018 - PARCEL 1 - ADDITIONAL PUE ON PARCEL 1 FROM -L- STA. 44+00 RT TO STA. 58+00 RT  
- REVISED EXISTING R/W LINE

8/17/99

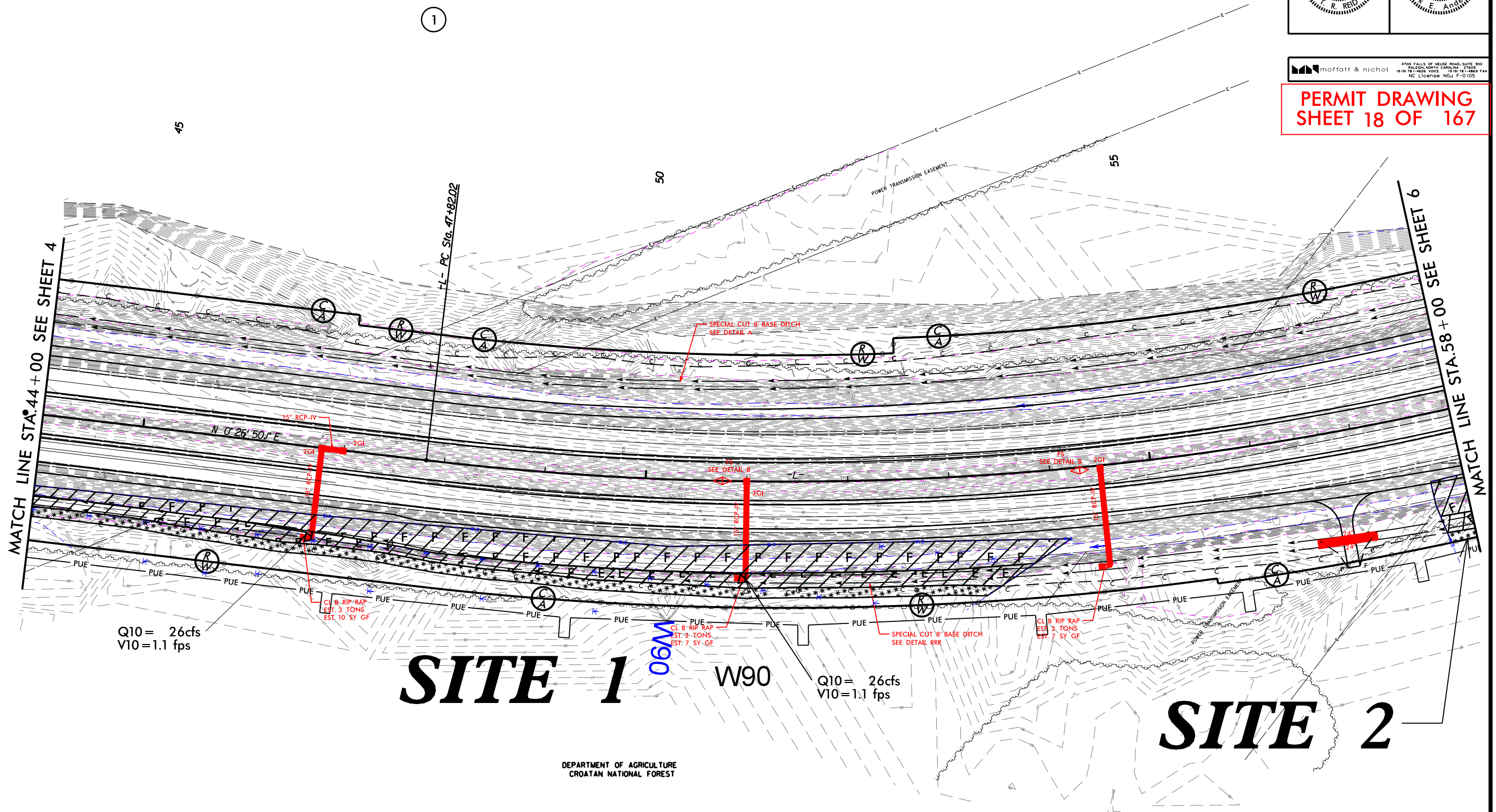
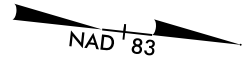
SYSTEMS DESIGN

PROJECT REFERENCE NO. R-1015	SHEET NO. 5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 015869 T. R. REID	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 032581 E. A. ANDERSON

moffatt & nichol  
4700 FALLS OF NEUSE ROAD, SUITE 300  
RALEIGH, NORTH CAROLINA 27609  
919/781-4625 VOICE 919/781-4625 FAX  
NC LICENSE NO. F-0105

**PERMIT DRAWING  
SHEET 18 OF 167**

DEPARTMENT OF AGRICULTURE  
CROATAN NATIONAL FOREST



MATCH LINE STA. 44+00 SEE SHEET 4

MATCH LINE STA. 58+00 SEE SHEET 6

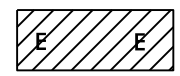
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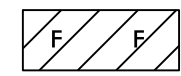
**SITE 1**

**SITE 2**

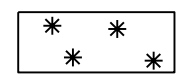
DEPARTMENT OF AGRICULTURE  
CROATAN NATIONAL FOREST



DENOTES EXCAVATION  
IN WETLAND



DENOTES FILL IN  
WETLAND



DENOTES MECHANIZED  
CLEARING

REVISIONS  
11/13/2018 - PARCEL 1 - ADDITIONAL PUE ON PARCEL 1 FROM -L- STA. 44+00 RT TO STA. 58+00 RT  
- REVISED EXISTING R/W LINE

8/17/99

SYSTEMS DESIGN

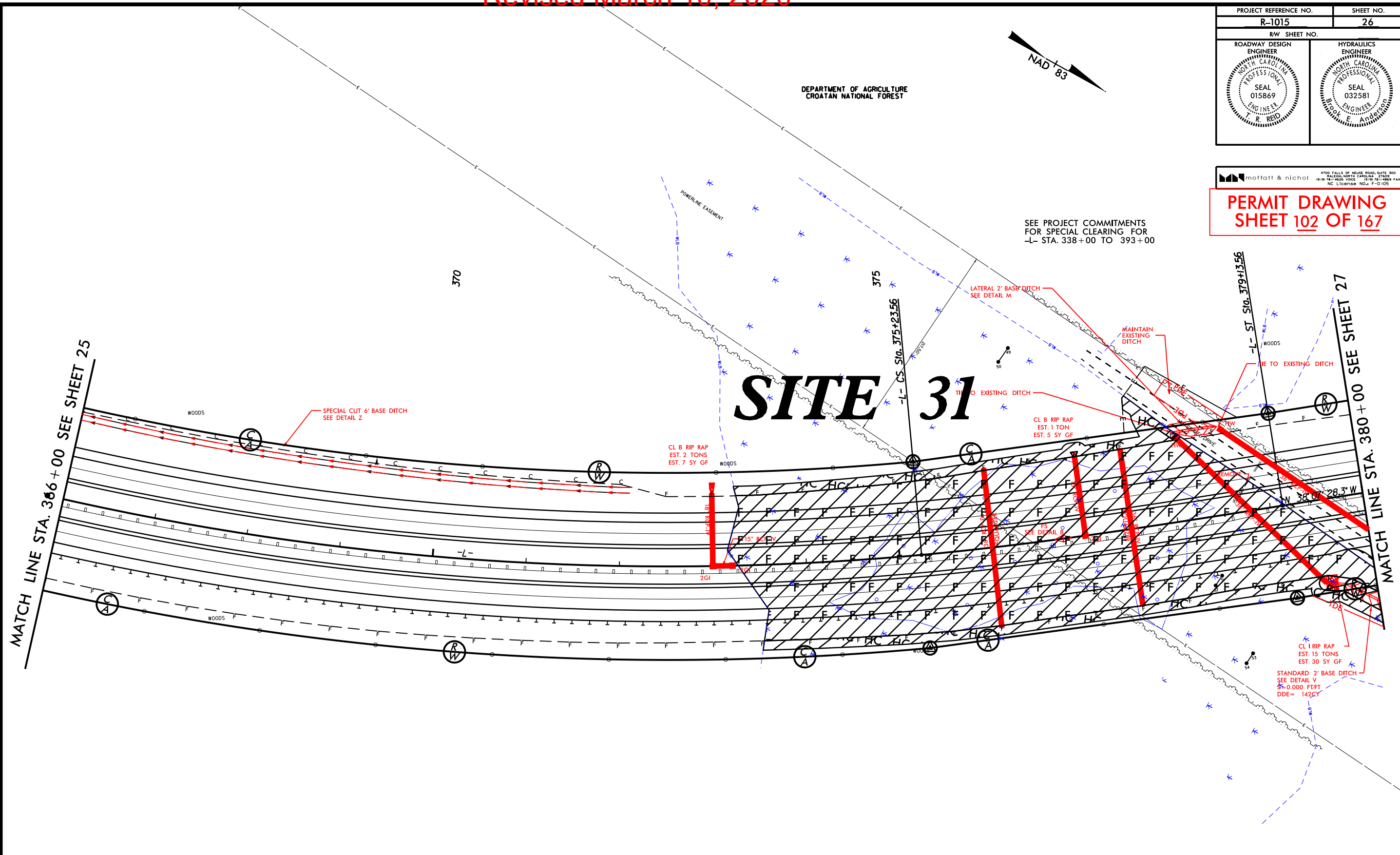
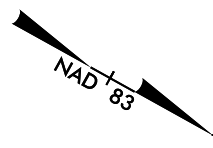
PROJECT REFERENCE NO. R-1015	SHEET NO. 26
RW SHEET NO.	
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 015869 T. R. REID	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 032581 T. R. REID

moffatt & nichol  
4700 FALLS OF NEUSE ROAD, SUITE 300  
RALEIGH, NORTH CAROLINA 27609  
919.781.4625 VOICE 919.781.4625 FAX  
NC LICENSE NO. F-0105

**PERMIT DRAWING**  
**SHEET 102 OF 167**

SEE PROJECT COMMITMENTS FOR SPECIAL CLEARING FOR -L- STA. 338+00 TO 393+00

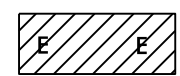
DEPARTMENT OF AGRICULTURE  
CROATAN NATIONAL FOREST



7/13/2018

REVISIONS

PARCEL 2 - ELIMINATED POE STATION -L- 369+50 TO 369+50 RT
PARCEL 2 - ELIMINATED POE STATION -L- 370+05 TO 377+70 RT
PARCEL 2 - ADDED POE STATION -L- 379+30 TO 380+00 RT
PARCEL 2 - CHANGED IDE TO POE AND REVISED AREA STATION -L- 378+35 TO 378+66 LT
PARCEL 2 - REVISED ICE AREA STATION -L- 377+58 TO 378+80 LT



DENOTES EXCAVATION IN WETLAND



DENOTES HAND CLEARING



DENOTES FILL IN WETLAND



SEE SHEETS 62 FOR PROFILE -L-  
SEE SHEETS 2D-1 THRU 2D-2 FOR DRAINAGE DITCH DETAILS

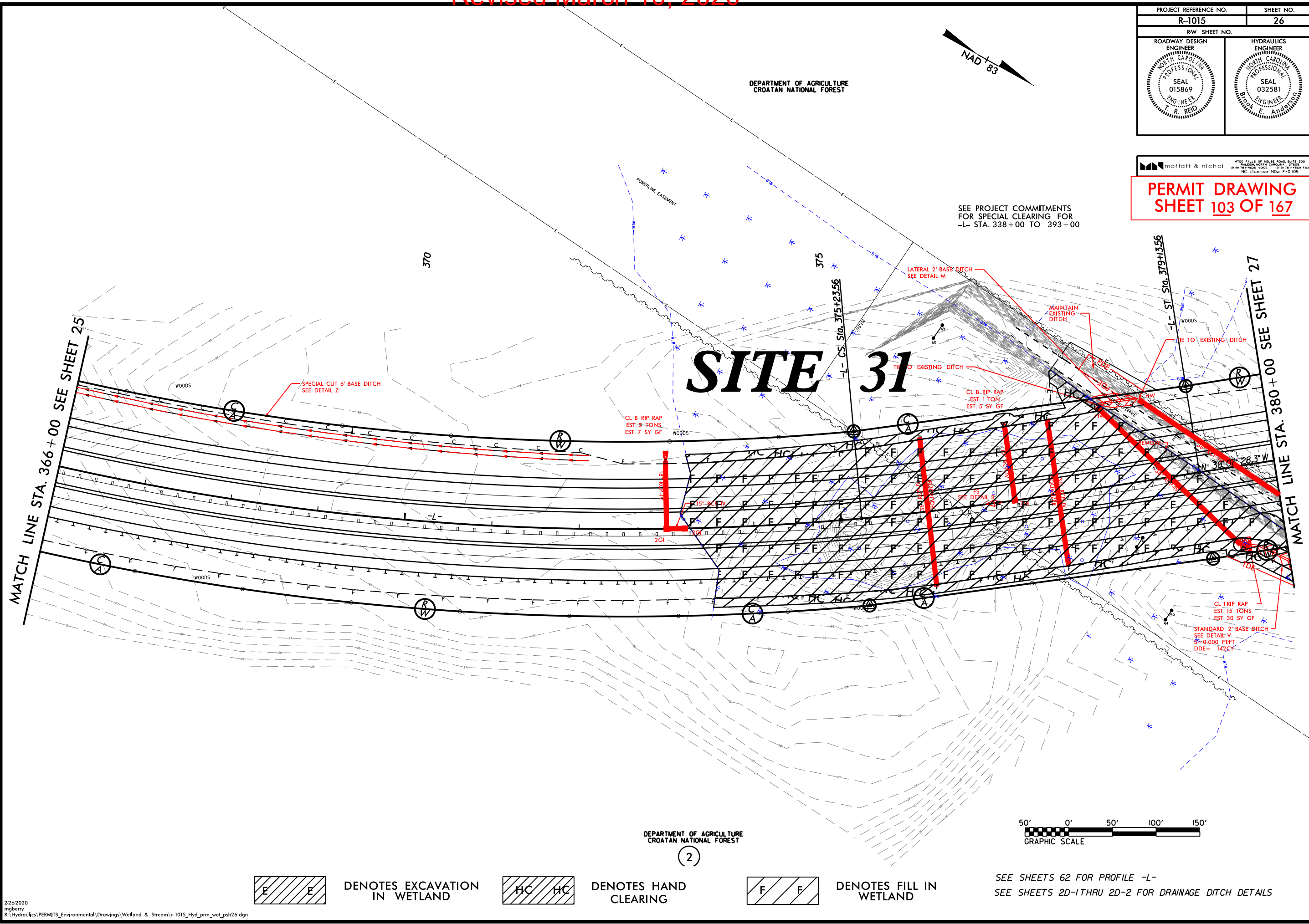
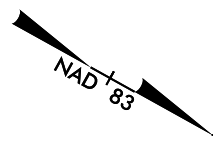
PROJECT REFERENCE NO. R-1015	SHEET NO. 26
RW SHEET NO.	
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 015869 T. R. REID	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 032581 E. ANDERSON

moffatt & nichol  
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RALEIGH, NORTH CAROLINA 27609  
919/781-4625 VOICE 919/781-1868 FAX  
NC LICENSE NO. F-0105

**PERMIT DRAWING**  
**SHEET 103 OF 167**

SEE PROJECT COMMITMENTS FOR SPECIAL CLEARING FOR -L- STA. 338+00 TO 393+00

DEPARTMENT OF AGRICULTURE  
CROATAN NATIONAL FOREST



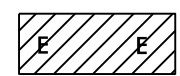
7/13/2018 --  
 REVISIONS  
 PARCEL 2 - ELIMINATED POE STATION -L- 369+50 TO 369+50 RT  
 PARCEL 2 - ELIMINATED TCE STATION -L- 370+05 TO 371+70 RT  
 PARCEL 2 - ADDED TCE STATION -L- 379+30 TO 380+00 RT  
 PARCEL 2 - CHANGED TCE TO POE AND REVISED AREA STATION -L- 378+35 TO 378+66 LT  
 PARCEL 2 - REVISED TCE AREA STATION -L- 377+58 TO 378+80 LT

MATCH LINE STA. 366+00 SEE SHEET 25

MATCH LINE STA. 380+00 SEE SHEET 27

# SITE 31

DEPARTMENT OF AGRICULTURE  
CROATAN NATIONAL FOREST



DENOTES EXCAVATION IN WETLAND



DENOTES HAND CLEARING



DENOTES FILL IN WETLAND

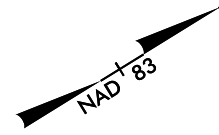
SEE SHEETS 62 FOR PROFILE -L-  
SEE SHEETS 2D-1 THRU 2D-2 FOR DRAINAGE DITCH DETAILS







DEPARTMENT OF AGRICULTURE  
CROATAN NATIONAL FOREST



PROJECT REFERENCE NO. R-1015	SHEET NO. 35
RW SHEET NO.	
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 015869 T. R. REID	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 032581 B. R. ANDERSON

moffatt & nichol  
4700 FALLS OF NEUSE ROAD, SUITE 300  
RALEIGH, NORTH CAROLINA 27609  
(919) 781-4625 VOICE (919) 781-4669 FAX  
NC LICENSE NO. F-0105

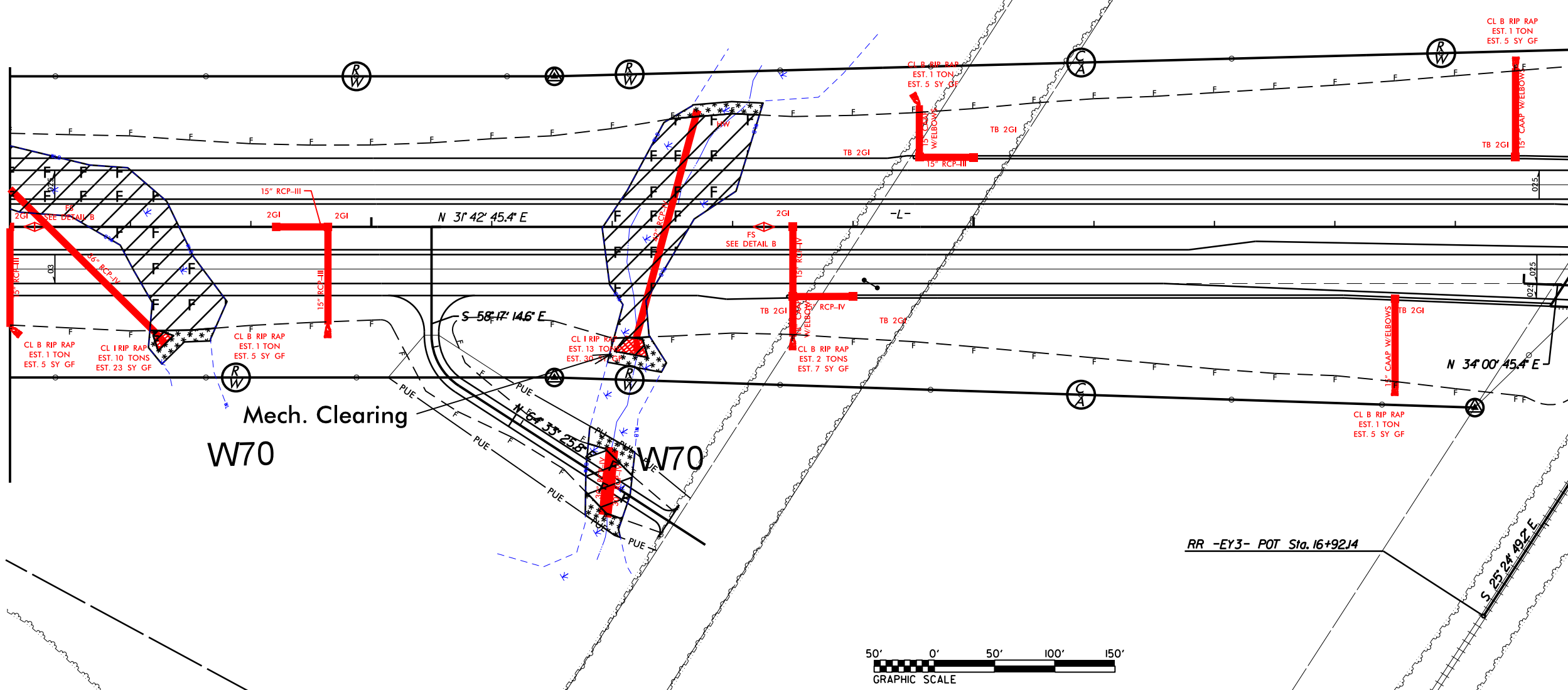
**PERMIT DRAWING**  
**SHEET 130 OF 167**

# SITE 38A

# SITE 38B

MATCH LINE STA. 492 + 00 SEE SHEET 34

MATCH LINE STA. 505 + 00 SEE SHEET 36



REVISIONS  
7/13/2018 - PARCEL 2 - CHANGED TCE TO PUE AND REVISED AREA STATION -L- 495+14 TO 496+10 RT



DEPARTMENT OF AGRICULTURE  
CROATAN NATIONAL FOREST

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

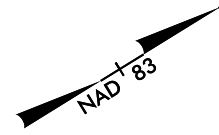
\* \* \* DENOTES MECHANIZED CLEARING

F F DENOTES FILL IN WETLAND

SEE SHEET 66 FOR PROFILE -L-  
SEE SHEET 85 FOR PROFILE -RP2C-  
SEE SHEET 91 FOR PROFILE -G12-  
SEE SHEET 2B-9 SKETCH 5 FOR PROPOSED BRIDGE SKETCH  
SEE SHEETS 2D-1 THRU 2D-2 FOR DRAINAGE DITCH DETAILS

2/25/2020  
mgberry  
R:\Hydraulics\PERMITS\_Environmental\Drawings\Wetland & Stream\r-1015\_Hyd\_prm\_wet\_psh35.dgn

DEPARTMENT OF AGRICULTURE  
CROATAN NATIONAL FOREST



PROJECT REFERENCE NO. R-1015	SHEET NO. 35
RW SHEET NO.	
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 015869 T. R. REID	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 032581 B. R. ANDERSON

4700 FALLS OF NEUSE ROAD, SUITE 300  
RALEIGH, NORTH CAROLINA 27609  
919/781-4625 VOICE 919/781-4625 FAX  
NC LICENSE NO. F-0105

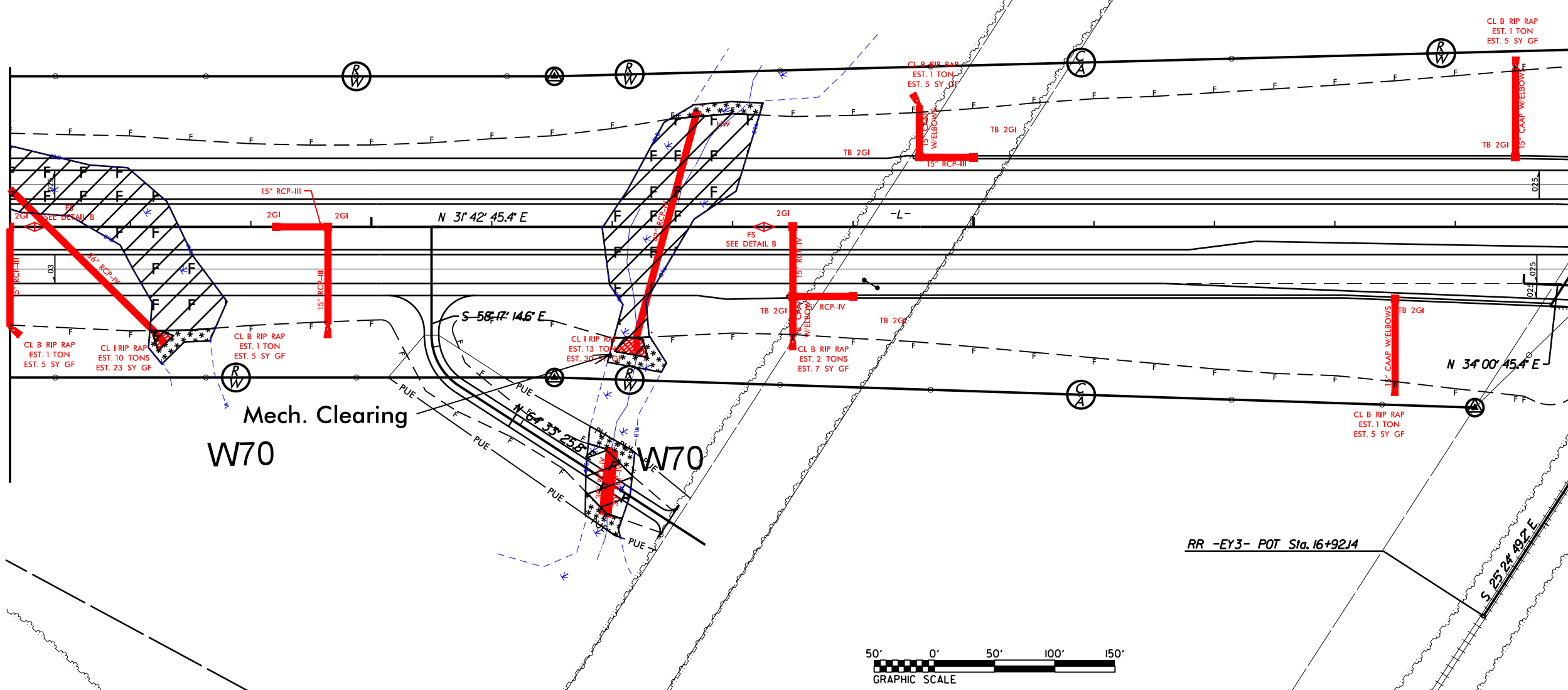
**PERMIT DRAWING**  
**SHEET 131 OF 167**

# SITE 38A

# SITE 38B

MATCH LINE STA. 492+00 SEE SHEET 34

MATCH LINE STA. 505+00 SEE SHEET 36



REVISIONS  
7/13/2018 - PARCEL 2 - CHANGED TCE TO PUE AND REVISED AREA STATION -L- 495+14 TO 496+10 RT



DEPARTMENT OF AGRICULTURE  
CROATAN NATIONAL FOREST

NORTH CAROLINA DEPARTMENT OF TRANSPORTATION

\* \* \* DENOTES MECHANIZED CLEARING

F F DENOTES FILL IN WETLAND

SEE SHEET 66 FOR PROFILE -L-  
SEE SHEET 85 FOR PROFILE -RP2C-  
SEE SHEET 91 FOR PROFILE -G12-  
SEE SHEET 2B-9 SKETCH 5 FOR PROPOSED BRIDGE SKETCH  
SEE SHEETS 2D-1 THRU 2D-2 FOR DRAINAGE DITCH DETAILS

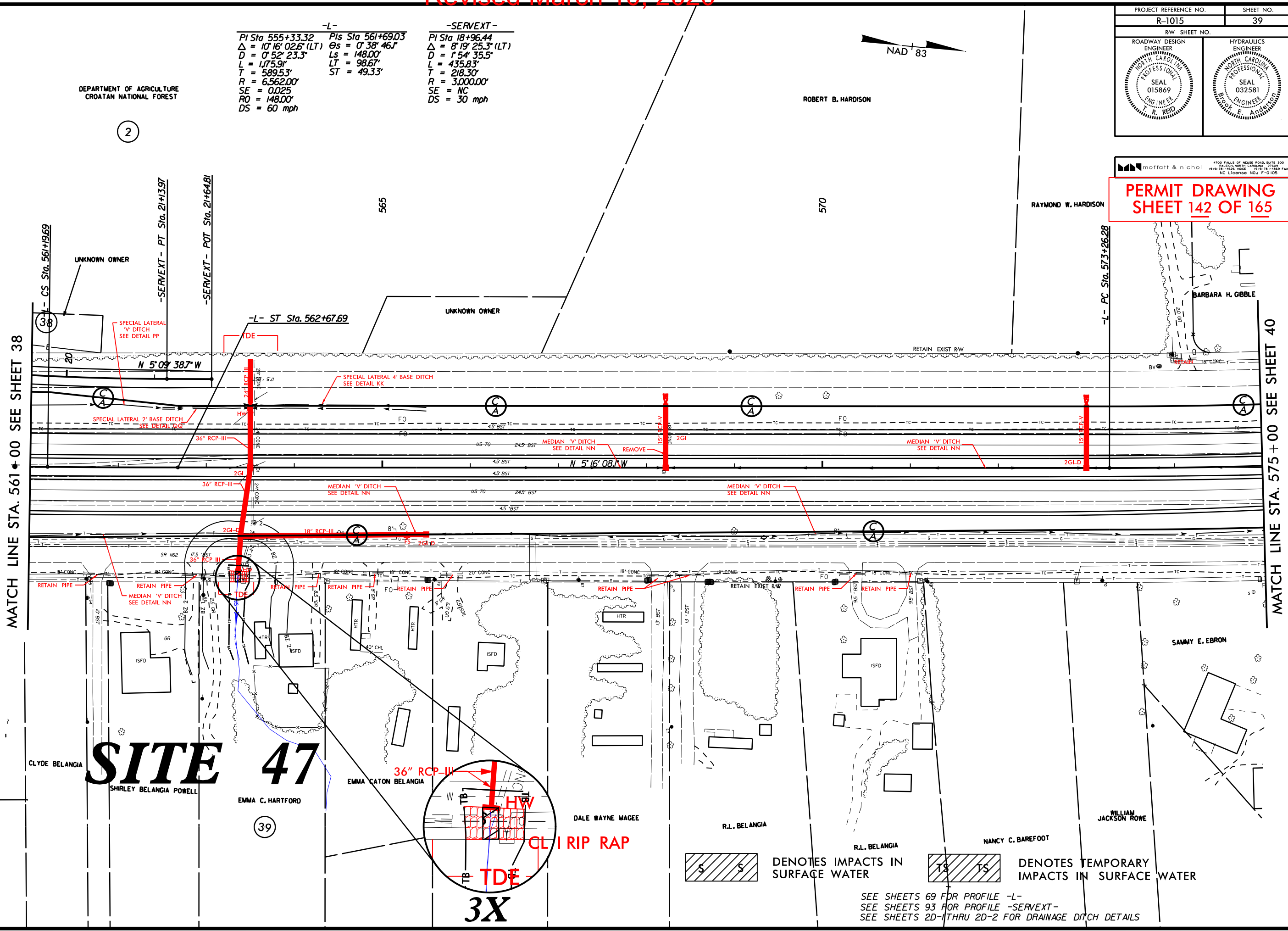
PROJECT REFERENCE NO. R-1015	SHEET NO. 39
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 015869 T. R. REID	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 032581 ROBERT B. HARDISON

4700 FALLS OF NEUSE ROAD, SUITE 300  
RALEIGH, NORTH CAROLINA 27607  
(919) 781-4626 VOICE (919) 781-7888 FAX  
NC LICENSE NO. F-0105

**PERMIT DRAWING**  
**SHEET 142 OF 165**

**-L-**  
 PI Sta 555+33.32 Δ = 10° 16' 02.6" (LT)  
 D = 0° 52' 23.3" Ls = 148.00'  
 L = 1,175.9' LT = 98.67'  
 T = 589.53' ST = 49.33'  
 R = 6,562.00'  
 SE = 0.025  
 RO = 148.00'  
 DS = 60 mph

**-SERVEXT-**  
 PI Sta 18+96.44 Δ = 8° 19' 25.3" (LT)  
 D = 1° 54' 35.5" Ls = 148.00'  
 L = 435.83' LT = 98.67'  
 T = 218.30' ST = 49.33'  
 R = 3,000.00'  
 SE = NC  
 DS = 30 mph



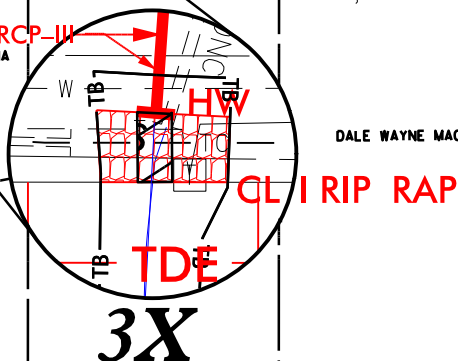
MATCH LINE STA. 561+00 SEE SHEET 38

MATCH LINE STA. 575+00 SEE SHEET 40

REVISIONS  
 7/13/2018 - PARCEL 38 - REVISED TDE STATION -L- 563+14 TO 563+64 RT  
 PARCEL 38 - ADDED TCE STATION -L- 561+00 TO 561+78 LT

2/25/2020  
 mgberry  
 R:\Hydraulics\PERMITS\_Environmental\Drawings\Wetland & Stream\1-1015\_Hyd\_prm\_wet\_psh39.dgn

**SITE 47**  
 SHIRLEY BELANGIA POWELL  
 EMMA C. HARTFORD



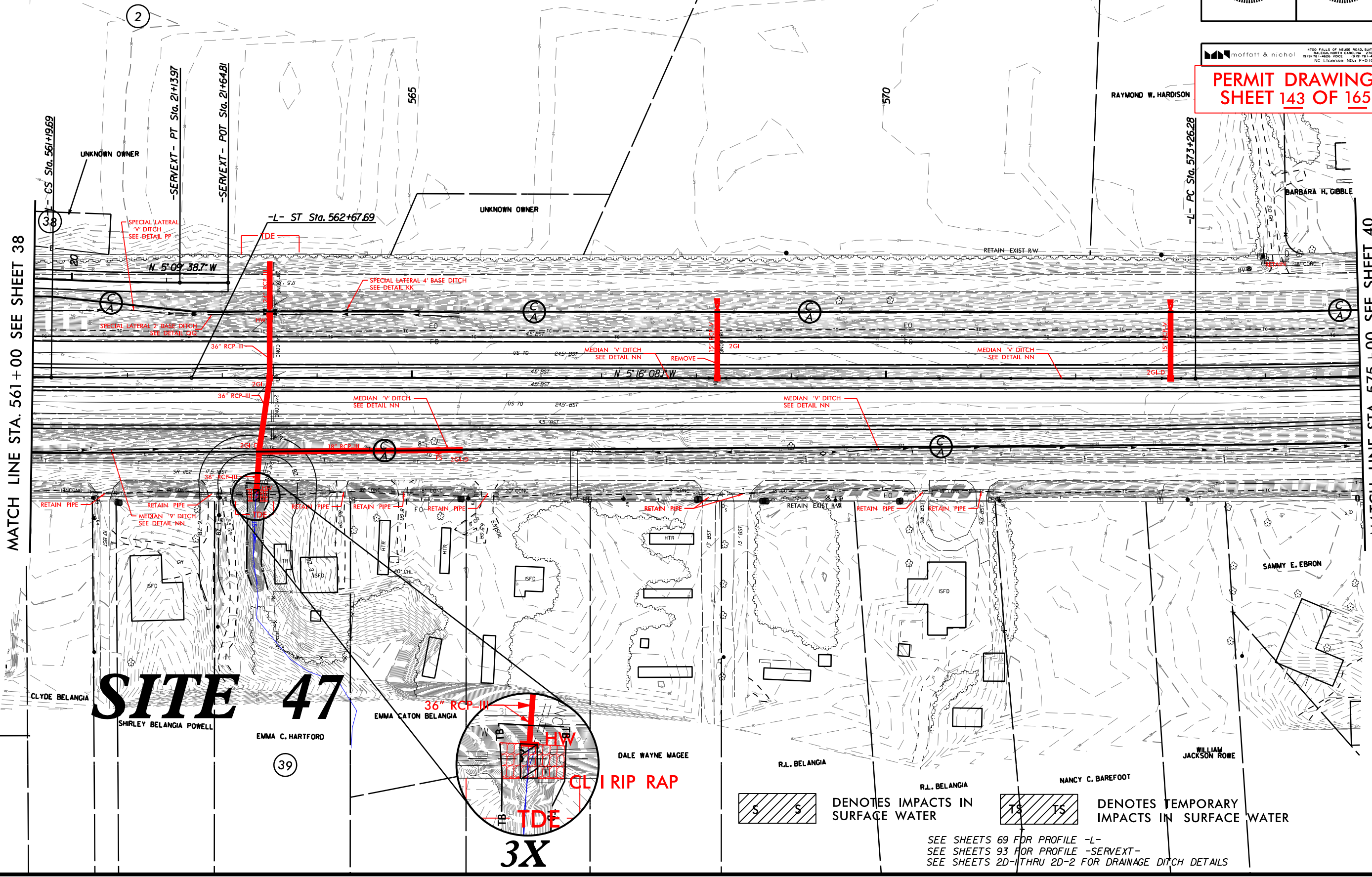
DENOTES IMPACTS IN SURFACE WATER  
 DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SEE SHEETS 69 FOR PROFILE -L-  
 SEE SHEETS 93 FOR PROFILE -SERVEXT-  
 SEE SHEETS 2D-1 THRU 2D-2 FOR DRAINAGE DITCH DETAILS

PROJECT REFERENCE NO. R-1015	SHEET NO. 39
ROADWAY DESIGN ENGINEER T. REID	HYDRAULICS ENGINEER R. HARDISON

PERMIT DRAWING SHEET 143 OF 165

-L-	-SERVEXT-
PI Sta 555+33.32 Δ = 10° 16' 02.6" (LT) D = 0' 52' 23.3" L = 1,175.9' T = 589.53' R = 6,562.00' SE = 0.025 RO = 148.00' DS = 60 mph	PIs Sta 561+69.03 θs = 0° 38' 46" Ls = 148.00' LT = 98.67' ST = 49.33'
PI Sta 18+96.44 Δ = 8° 19' 25.3" (LT) D = 1° 54' 35.5" L = 435.83' T = 218.30' R = 3,000.00' SE = NC DS = 30 mph	



MATCH LINE STA. 561 + 00 SEE SHEET 38

MATCH LINE STA. 575 + 00 SEE SHEET 40

REVISIONS  
7/13/2018 - PARCEL 38 - REVISED TDE STATION -L- 563+14 TO 563+64 RT  
PARCEL 38 - ADDED TCE STATION -L- 561+00 TO 561+78 LT

2/25/2020  
mgberry  
R:\Hydraulics\PERMITS\_Environmental\Drawings\Wetland & Stream\1-1015\_Hyd\_prm\_wet\_psh39.dgn

DENOTES IMPACTS IN SURFACE WATER  
 DENOTES TEMPORARY IMPACTS IN SURFACE WATER

SEE SHEETS 69 FOR PROFILE -L-  
SEE SHEETS 93 FOR PROFILE -SERVEXT-  
SEE SHEETS 2D-1 THRU 2D-2 FOR DRAINAGE DITCH DETAILS







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	42+12 TO 54+15 -L- RT	ROADWAY FILL	0.59		0.32	0.25						
2	57+70 TO 76+06 -L- RT	ROADWAY FILL	2.68		1.65	0.73						
	0+00 TO 33+68 -RP1CD- RT											
3	70+94 TO 122+68 -L- RT/LT	ROADWAY FILL	26.03		0.32	3.07						
	22+61 TO 29+63 -RP1AB- LT											
4	127+97 TO 132+42 -L- LT/RT	ROADWAY FILL	1.53			0.09						
5	136+88 TO 140+23 -L- LT/RT	ROADWAY FILL	0.10		0.06	0.07	0.08					
6	138+19 TO 149+15 -L- LT/RT	ROADWAY FILL	5.17			0.37						
7	154+60 TO 163+94 -L- LT/RT	ROADWAY FILL	2.52			0.32						
8	167+89 TO 168+21 -L- LT/RT	ROADWAY FILL	0.02			< 0.01						
9	170+05 TO 197+19 -L- LT/RT	Dual Bridges; 12@ 135', 72" MBT	4.90			0.64	3.95					
10	197+45 TO 210+28 -L- LT/RT	ROADWAY FILL	6.69			0.55						
11	211+31 TO 218+97 -L- LT/RT	ROADWAY FILL	2.82			0.21						
12	218+39 TO 224+77 -L- LT/RT	ROADWAY FILL	2.46		< 0.01	0.16						
13	229+73 TO 238+69 -L- LT/RT	ROADWAY FILL	6.85			0.37						
14	7+87 TO 11+18 -Y3RPB- LT/RT	72" RCP, BURIED	0.83			0.16		0.05	< 0.01	337.9	56.1855	
15	12+60 TO 13+72 -Y3RPB- LT/RT	ROADWAY FILL	0.32			0.03						
16	237+79 TO 244+33 -L- LT/RT	72" RCP, BURRIED 1'	2.42			0.22		0.03	< 0.01	200.9	58.8936	
17	52+61 TO 53+18 -Y3DET- LT/RT	72" RCP, BURRIED 1'	0.04		0.01	0.01		0.03	0.02	129.7	88.99	
17A	52+61 TO 53+18 -Y3DET- LT/RT	60" TEMP PIPE		0.05			0.01					
18	20+55 TO 24+91 -Y3RPD- LT/RT	ROADWAY FILL	0.98		0.02	0.10						
18A	55+30 TO 57+16-Y3DET- LT/RT	TEMP DETOUR		0.15			0.03					
19	16+94 TO 17+92 -Y3RPD- LT/RT	84" RCP, BURIED 1'	0.09			0.05		0.06	< 0.01	261.2	44.1	
TOTALS*:			67.06	0.20	2.38	7.41	4.07	0.16	0.04	930	248	0

\*Rounded totals are sum of actual impacts

NOTES:  
Bridge Impacts at Site 9: 0.02 acres for Temporary Bents, <0.01 acres for all permanent bents.

NC DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
03/05/2020  
CRAVEN COUNTY  
R-1015  
34360.1.2  
SHEET 165 OF 167

Revised 2016 09 09

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)
20	57+34 TO 62+48 -Y3- RT	ROADWAY FILL	1.46		0.10	0.18						
21	58+29 TO 63+51 -Y3- RT	ROADWAY FILL	0.56		0.21	0.08						
21A	58+89 TO 64+03Y3DET- LT/RT	TEMP DETOUR		0.25	0.11		0.12					
22	267+83 TO 273+90 -L- LT/RT	84" RCP, BURIED 1'	0.86			0.12		0.05	0.01	583.6	61.1099	
23	280+57 TO 293+27 -L- LT/RT	Dual Bridge; 7 @ 135', 72" MBT	1.03			0.15	3.05					
24	308+19 TO 314+60 -L- LT/RT	42" RCP	0.74		0.04	0.06						
25A	328+41 TO 336+80 -L- LT/RT	2 @ 72" RCP, BURIED 1'	1.80		0.10	0.12						
25B	325+13 TO 325+48 -L- RT	ROADWAY FILL	< 0.01			< 0.01						
26	337+97 TO 342+81 -L- RT	72" RCP, BURIED 1'	0.48		< 0.01		0.11					
27	340+63 TO 344+93 -L- LT	72" RCP, BURIED 1'	0.75		0.08		0.05					
28A	348+96 TO 349+65 -L- RT	ROADWAY FILL	0.01				0.02					
28B	351+33 TO 352+19 -L- RT	ROADWAY FILL	< 0.01				0.02					
29	355+33 TO 357+51 -L- LT	ROADWAY FILL	0.03		0.07		0.04					
30	355+83 TO 357+47 -L- RT	ROADWAY FILL	0.27				0.04					
31	373+16 TO 380+23 -L- LT/RT	ROADWAY FILL	2.22		0.07		0.32					
32	392+99 TO 399+33 -L- LT/RT	ROADWAY FILL	0.56			0.15						
33	408+22 TO 408+87 -L- LT	ROADWAY FILL	< 0.01			0.01						
34	409+25 TO 409+75 -L- RT	ROADWAY FILL	0.18			< 0.01						
35A	432+62 TO 449+72 -L- LT/RT	ROADWAY FILL	5.49			0.77						
35B	450+94 TO 454+47 -L- LT/RT	ROADWAY FILL	0.71			0.11						
36A	456+65 TO 461+70 -L- LT/RT	84" RCP, BURIED 1'	0.79			0.15						
36B	462+57 TO 464+60 -L- LT/RT	ROADWAY FILL	0.50		0.02	0.05						
37	468+85 TO 486+94 -L- LT/RT	ROADWAY FILL	3.43		0.01	0.50						
SUB TOTALS THIS SHEET*:			21.90	0.25	0.80	2.47	3.77	0.05	0.01	584	61	0

\*Rounded totals are sum of actual impacts

NOTES:  
Bridge Impacts at Site 23: 0.04 acres for Temporary Bents, <0.01 acres for all permanent bents.

NC DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
03/05/2020  
CRAVEN COUNTY  
R-1015  
34360.1.2  
SHEET 166 OF 167

Revised 2016 09 09


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)
38A	489+64 TO 493+80 -L- LT/RT	ROADWAY FILL	0.49			0.03						
38B	496+92 TO 498+23 -L- LT/RT	ROADWAY FILL	0.30			0.06						
39	507+39 TO 518+70 -L- LT/RT	2 @ 10'X8' RCBC	2.99		0.07	0.20		0.22	0.03	984.87	116.37	
40	RP2AC/RP2A/LP2A	ROADWAY FILL	5.38		0.12	0.78						
41	41+40 TO 47+97 -RP2AC- LT/RT	EXTEND 3@ 9'X7' RCBC	0.03			0.12		0.05	0.08	48.71	56.79	
42	34+08 TO 37+91 -Y4- LT	72" RCP, BURIED 1'	0.01		0.04	0.06		< 0.01	< 0.01	20.43	11.6	
43	33+80 TO 35+02 -Y4- RT	72" RCP, BURIED 1'	< 0.01		0.01	0.04		< 0.01	< 0.01	41.75	10.35	
44	51+17 TO 53+70 -Y4- LT	2 @ 84" RCP, BURIED1'	0.24		0.02	0.09		0.02	< 0.01	121.5	10.7	
45	50+49 TO 57+08 -Y4DET- LT/RT	2 @ 84" RCP, BURIED1'	0.35			0.12		0.04	0.02	116.4	98.9	
45A	50+47 TO 57+03 -Y4DET-	TEMP DETOUR		0.51				0.19				
46	533+11 -L- RT	30" RCP						< 0.01	< 0.01	10.0	16.0	
47	563+36 -L- RT	36" RCP						< 0.01		12.0		
SUB TOTAL THIS SHEET:			9.79	0.51	0.27	1.50	0.19	0.34	0.13	1356	321	
SUB TOTAL SHEET 1:			67.06	0.20	2.38	7.41	4.07	0.16	0.04	930	248	
SUB TOTAL SHEET 2:			21.90	0.25	0.80	2.47	3.77	0.05	0.01	584	61	
TOTALS*:			98.75	0.96	3.45	11.38	8.03	0.55	0.18	2869	630	0

\*Rounded totals are sum of actual impacts

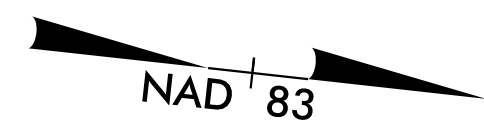
NOTES:  
At Site 45/45A, 0.03 acre of Temporary Fill in Wetlands in the Hand Clearing area for erosion control measures.

NC DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
03/05/2020  
CRAVEN COUNTY  
R-1015  
34360.1.2  
SHEET 167 OF 167

Revised 2016 09 09

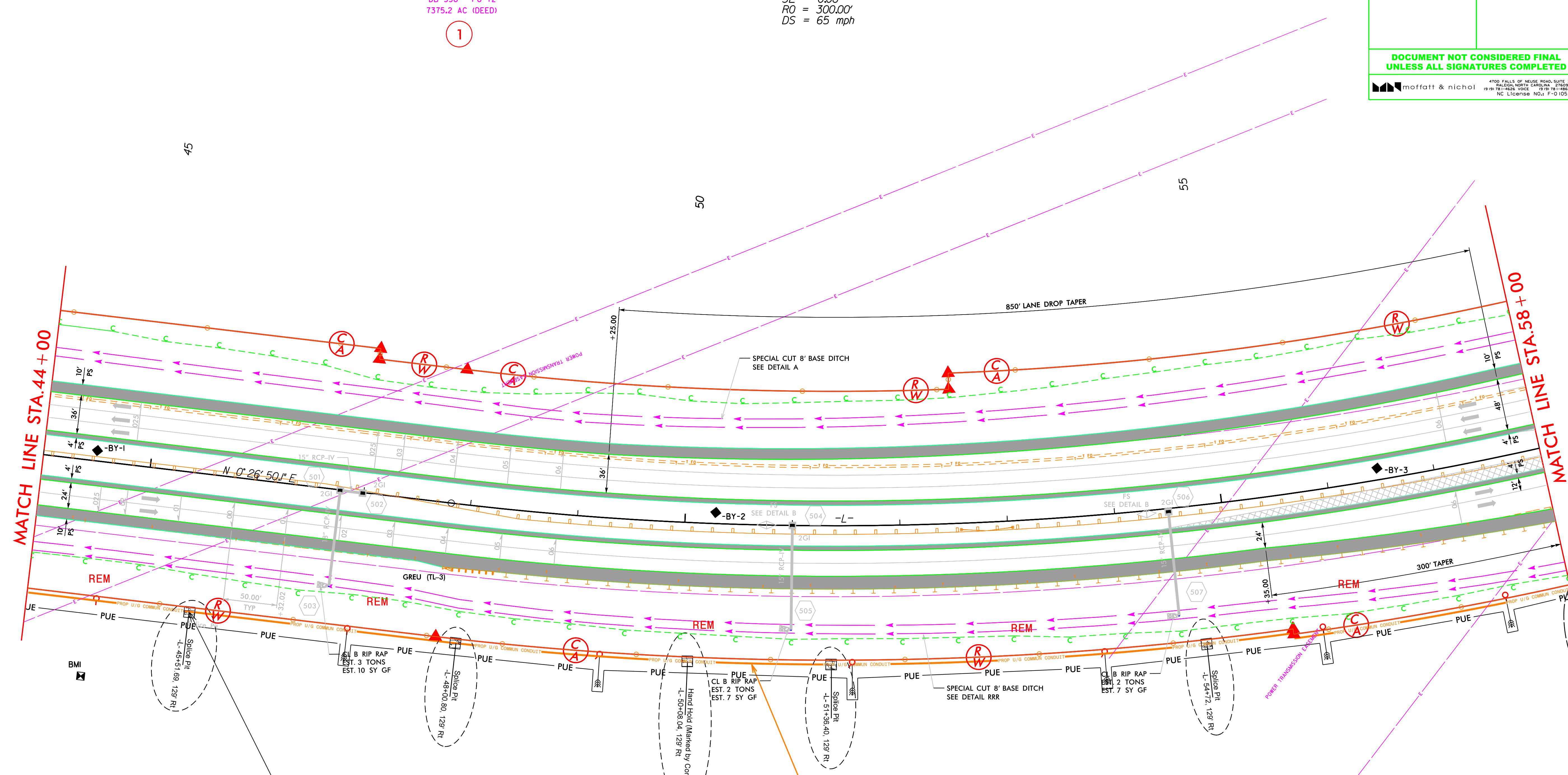
PROJECT REFERENCE NO. <b>R-1015</b>	SHEET NO. <b>NE-03</b>
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
	

-L-  
 PI Sta 58+21.81  
 $\Delta = 38^{\circ} 01' 15.2''$  (LT)  
 $D = 1' 53' 54.5''$   
 $L = 2,002.71'$   
 $T = 1,039.80'$   
 $R = 3,018.00'$   
 $SE = 0.06$   
 $RO = 300.00'$   
 $DS = 65$  mph



DEPARTMENT OF AGRICULTURE  
 CROATAN NATIONAL FOREST  
 DB 336 - PG 9  
 DB 336 - PG 72  
 7375.2 AC (DEED)

1



Splice Pits Hand Clearing Impacts =  
 10.0' x 10.0' (100.0 Sf) x 4 Splice Pits = 400 SF  
 HandHold Pit Hand Clearing Impacts =  
 5.0' x 3.0' (15.0 SF) x 1 HandHold Pit = 15 SF  
 TOTAL For This Sheet = 415 SF

DEPARTMENT OF AGRICULTURE  
 CROATAN NATIONAL FOREST  
 DB 336 - PG 9  
 DB 336 - PG 72  
 7375.2 AC (DEED)

1

UNDERGROUND  
 COMMUNICATION LINES

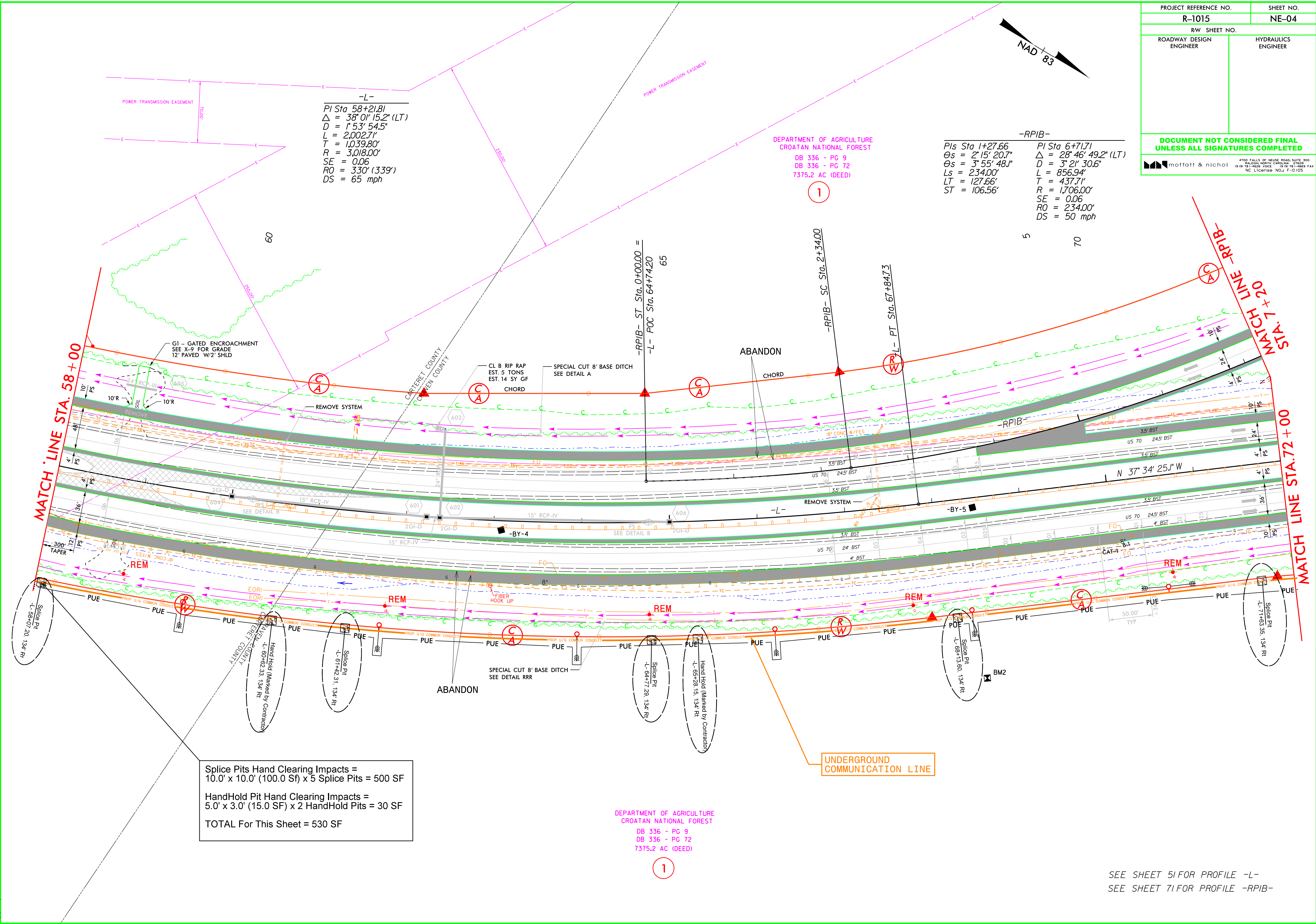
SEE SHEET 50 FOR PROFILE -L-

REVISIONS

8/17/99  
 05-DEC-2019 11:45  
 US:\Projects\Files\Utilities\Engineering\NEU\1015\_rdy5\_NE03\_psh.dgn  
 moffatt & nichol

PROJECT REFERENCE NO. R-1015	SHEET NO. NE-04
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
moffatt & nichol	

8/17/99  
05-DEC-2018 12:02  
US:\Project Files\Utilities\Engineering\NEU\1015\_r.dwg-NE04\_psh.dwg  
faceplot



-L-  
PI Sta 58+21.81  
Δ = 38° 01' 15.2" (LT)  
D = 1' 53' 54.5"  
L = 2,002.71'  
T = 1,039.80'  
R = 3,018.00'  
SE = 0.06  
RO = 330' (339')  
DS = 65 mph

-RPIB-  
PIs Sta 1+27.66  
θs = 2° 15' 20.7"  
θs = 3° 55' 48.1"  
Ls = 234.00'  
LT = 127.66'  
ST = 106.56'

PI Sta 6+71.71  
Δ = 28° 46' 49.2" (LT)  
D = 3' 21' 30.6"  
L = 856.94'  
T = 437.71'  
R = 1,706.00'  
SE = 0.06  
RO = 234.00'  
DS = 50 mph

Splice Pits Hand Clearing Impacts =  
10.0' x 10.0' (100.0 Sf) x 5 Splice Pits = 500 SF  
HandHold Pit Hand Clearing Impacts =  
5.0' x 3.0' (15.0 Sf) x 2 HandHold Pits = 30 SF  
TOTAL For This Sheet = 530 SF

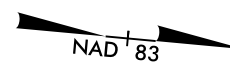
DEPARTMENT OF AGRICULTURE  
CROATAN NATIONAL FOREST  
DB 336 - PG 9  
DB 336 - PG 72  
7375.2 AC (DEED)

SEE SHEET 51 FOR PROFILE -L-  
SEE SHEET 71 FOR PROFILE -RPIB-



PROJECT REFERENCE NO. R-1015	SHEET NO. 39
RW SHEET NO.	
ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 015869 T. R. REID	HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 032581 E. A. HARDISON

moffatt & nichol  
4700 FALLS OF NEUSE ROAD, SUITE 300  
RALEIGH, NORTH CAROLINA 27609  
919/781-4825 VOICE 919/781-1885 FAX  
NC LICENSE NO. F-0105



ALLOWABLE IMPACTS ZONE 1

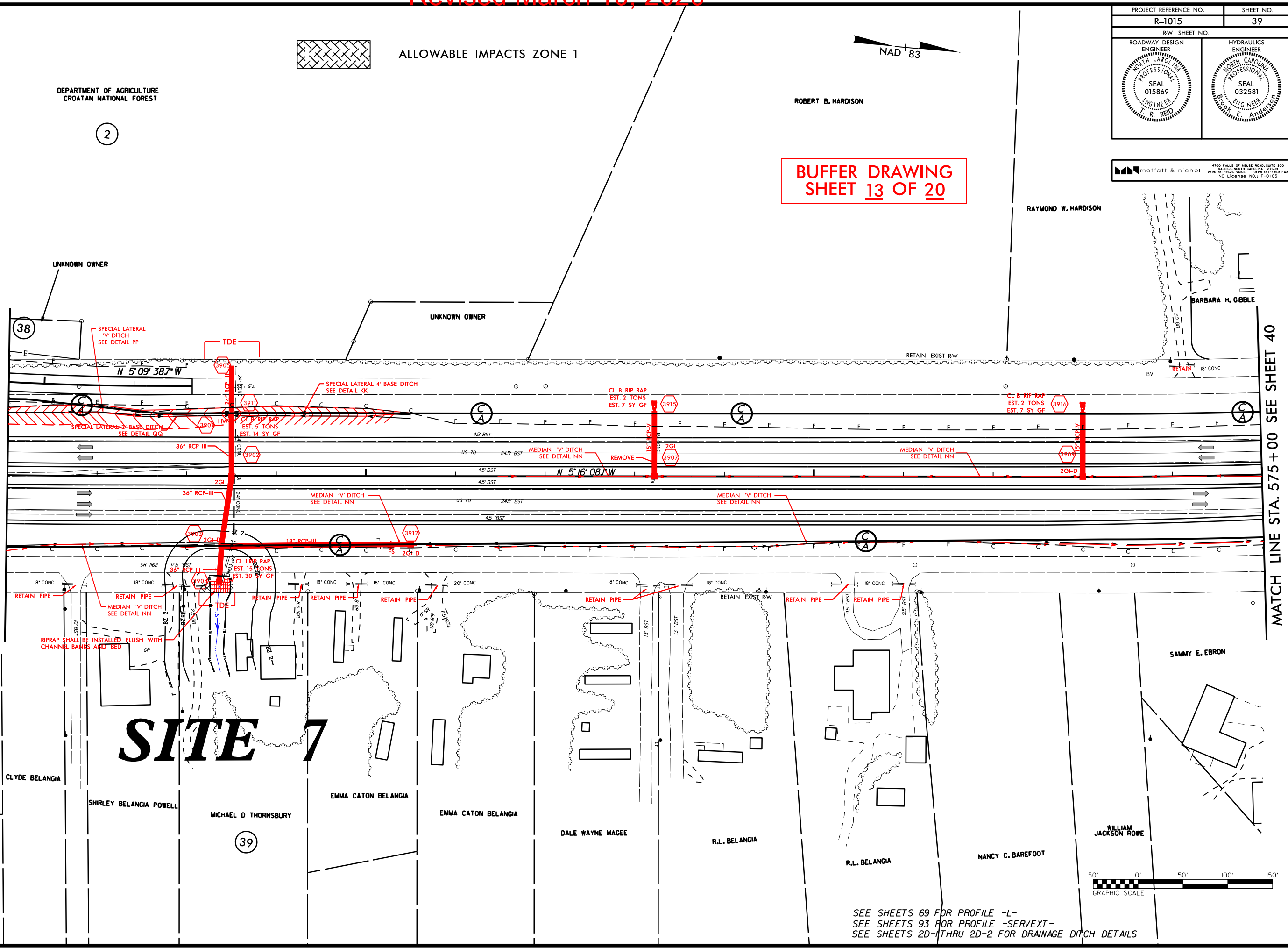
DEPARTMENT OF AGRICULTURE  
CROATAN NATIONAL FOREST

**BUFFER DRAWING SHEET 13 OF 20**

2/25/2020  
 R:\Hydro\Permits\_Environmental\Drawings\Buffer\1-1015\_Hyd\_perm\_buf\_04139.dgn  
 7/13/2018 - PARCEL 38 - REVISED TDE STATION -L- 563+14 TO 563+64 RT  
 PARCEL 38 - ADDED TCE STATION -L- 561+00 TO 561+78 LT  
 \$\$\$\$\$\$SYTIME\$\$\$\$\$\$  
 \$\$\$\$\$\$DESIGN\$\$\$\$\$\$  
 \$\$\$\$\$\$DATE\$\$\$\$\$\$

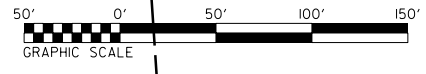
MATCH LINE STA. 561 + 00 SEE SHEET 38

MATCH LINE STA. 575 + 00 SEE SHEET 40



**SITE 7**

CLYDE BELANGIA  
 SHIRLEY BELANGIA POWELL  
 MICHAEL D THORNSBURY  
 EMMA CATON BELANGIA  
 EMMA CATON BELANGIA  
 DALE WAYNE MAGEE  
 R.L. BELANGIA  
 R.L. BELANGIA  
 NANCY C. BAREFOOT  
 SAMMY E. EBON  
 WILLIAM JACKSON ROWE



SEE SHEETS 69 FOR PROFILE -L-  
SEE SHEETS 93 FOR PROFILE -SERVEXT-  
SEE SHEETS 2D-1 THRU 2D-2 FOR DRAINAGE DITCH DETAILS

**BUFFER IMPACTS SUMMARY**

SITE NO.	STRUCTURE SIZE / TYPE	STATION (FROM/TO)	IMPACT									BUFFER REPLACEMENT	
			TYPE			ALLOWABLE			MITIGABLE			ZONE 1 (ft <sup>2</sup> )	ZONE 2 (ft <sup>2</sup> )
			ROAD CROSSING	BRIDGE	TEMP ROAD CROSSING	ZONE 1 (ft <sup>2</sup> )	ZONE 2 (ft <sup>2</sup> )	TOTAL (ft <sup>2</sup> )	ZONE 1 (ft <sup>2</sup> )	ZONE 2 (ft <sup>2</sup> )	TOTAL (ft <sup>2</sup> )		
1	12 @ 135' Dual Bridge	-L- 170+00 to -L- 176+39		X		11874	8173	20048					
2	72" RCP-V, Buried 1'	-Y3RPB- 8+09 to -Y3RPB- 9+96	X						21342	12842	34184		
3	72" RCP-V, Buried 1'	-L- 242+20 to -L- 245+59	X						20168	13088	33256		
3	Temp. Detour	-L- 245+59 to -L- 246+42			X	4312	2113	6425					
4	84" RCP-V, Buried 1'	-Y3RPD- 16+26 to -Y3RPD-18+42	X						17227	9603	26830		
5	7@ 135' Dual Bridge	-L- 287+68 to -L- 290+04		X		11674	7869	19544					
6	2 @ 10'X8' RCBC	-L- 509+18 to -L- 511+11	X						55373	29278	84651		
7	36" RCP	-L- 563+14 to -L- 563+54	X			135							
8	72" RCP-IV, Buried 1'	-Y4- 33+67 to -Y4- 34+86	X			3321	1827	5148					
9	2@ 84" RCP, Buried 1'	-Y4- 51+04 to -Y4- 52+99	X						12648	6275	18923		
<b>SUB TOTAL:</b>						31317	19982	51164	126759	71086	197845		

NOTE: Site 9: Zone 1 Mitigable Impacts include 331 sqft of Bank Stabilization.

N.C. DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS

CRAVEN COUNTY  
PROJECT: 34360.1.2 (R-1015)

2/25/2020  
SHEET 18 OF 20



