



North Carolina Department of Transportation

Highway Stormwater Program  
STORMWATER MANAGEMENT PLAN

FOR NCDOT PROJECTS



(Version 2.08; Released April 2018)

WBS Element: 36599.1.5      TIP No.: R-4707      County(ies): Guilford      Page 1 of 3

General Project Information

WBS Element:	36599.1.5	TIP Number:	R-4707	Project Type:	Other	Date:	4/3/2019
NCDOT Contact:	Craig Lee, PE		Contractor / Designer:	Mead & Hunt/Roger Weadon, PE			
Address:	1590 Mail Service Center Raleigh, NC 27699-1590		Address:	111 E. Hargett Street, Suite 300 Raleigh, NC 27601			
	Phone: 919-707-6708			Phone: (919) 714-8669			
	Email: <a href="mailto:cilee@ncdot.gov">cilee@ncdot.gov</a>			Email: <a href="mailto:roger.weadon@meadhunt.com">roger.weadon@meadhunt.com</a>			
City/Town:	Greensboro		County(ies):	Guilford			
River Basin(s):	Cape Fear		CAMA County?	No			
Wetlands within Project Limits?	Yes						

Project Description

Project Length (lin. miles or feet):	1.36	Surrounding Land Use:	Residential, Industrial				
Project Built-Up Area (ac.)		Proposed Project			Existing Site		
36.3		36.3 ac.			26.7 ac.		
Typical Cross Section Description:	US-29 will remain the same typical section with minor widening and realignment to accommodate interchange improvements. SR 4771 (Reedy Fork Pkwy) is to be realigned with a proposed DDI interchange over US-29 south of its current location. A section of SR 2526 (Summit Ave) will be upgraded from a 2-lane undivided facility to a 4-lane facility with a concrete median.			US-29 is a 4-lane divided highway with a grassed median and shoulder section. SR 4771 (Reedy Fork Pkwy) is an existing 2-lane facility with shoulder section with various widths to accommodate turn lanes. SR 2526 (Summit Ave) is also a 2-lane undivided facility with a shoulder section and variable widths to accommodate turn lanes in spots.			

Annual Avg Daily Traffic (veh/hr/day):	Design/Future:	49,000	Year:	2040	Existing:	40,200	Year:	2020
--	----------------	--------	-------	------	-----------	--------	-------	------

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

R-4707 is a project that involves improving the interchange of US-29 and SR 4771 (Reedy Fork Pkwy). The interchange improvements involve removing the existing bridge of the interchange and realigning SR 4771 (Reedy Fork Pkwy) to cross US-29 over new location. The proposed interchange will be a DDI interchange located south of the current interchange. The project also involves improving a section of SR 2526 (Summit Ave.) and reconfiguring the intersection with SR 4771 (Reedy Fork Pkwy.) along with improving driveway connections to businesses in the industrial area for increased truck traffic. BMPs were used throughout the project for stormwater treatment and to minimize erosion. Sheet flow across grassed median and shoulder sections will also provide treatment of stormwater before entering environmentally sensitive areas. Rip Rap pads and Preformed Scour Holes have been placed at pipe outlets to dissipate stormwater energy. This will slow stormwater velocities and minimize erosion at pipe outlets. A swale was used when applicable to slow conveyed stormwater to an acceptable velocity as it enters and passes through the buffer zones. A step pool is also used for the transition of an existing minor tributary into a relocated channel between the culverts. Roadway grade changes were kept to a minimum over existing to help minimize impacts. Stream impacts were also minimized during the construction of the culverts and relocation channel.

Waterbody Information

Surface Water Body (1):	Unnamed Tributary at Camp Herman		NCDWR Stream Index No.:	16-11-10-(2)				
NCDWR Surface Water Classification for Water Body	Primary Classification:	Water Supply V (WS-V)						
	Supplemental Classification:	Nutrient Sensitive Waters (NSW)						
Other Stream Classification:								
Impairments:								
Aquatic T&E Species?	Comments:							
NRTR Stream ID:							Buffer Rules in Effect:	Jordan Lake
Project Includes Bridge Spanning Water Body?	No	Deck Drains Discharge Over Buffer?	N/A				Dissipator Pads Provided in Buffer?	No
Deck Drains Discharge Over Water Body?	N/A	(If yes, provide justification in the General Project Narrative)				(If yes, describe in the General Project Narrative; if no, justify in the General Project Narrative)		
(If yes, provide justification in the General Project Narrative)								





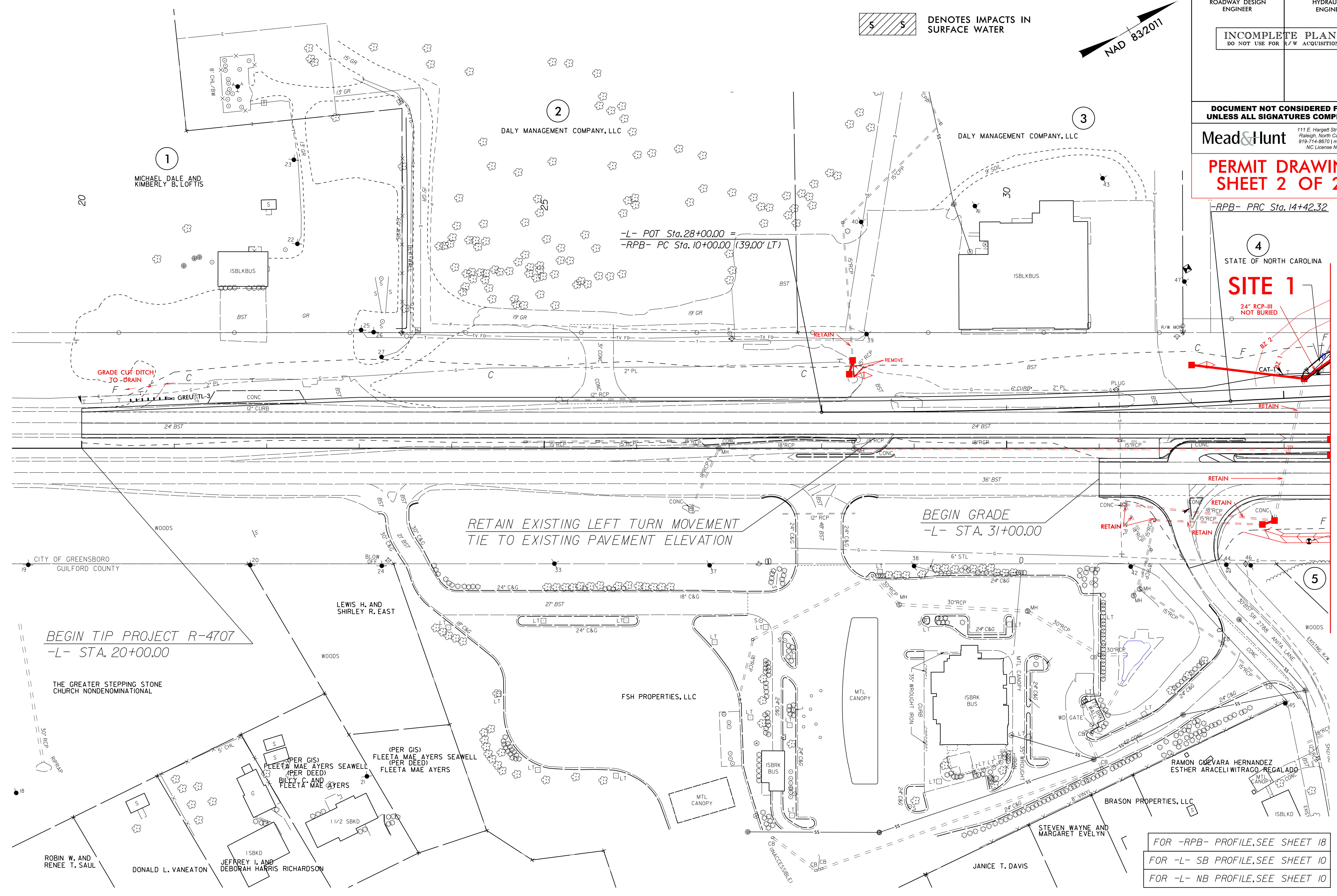




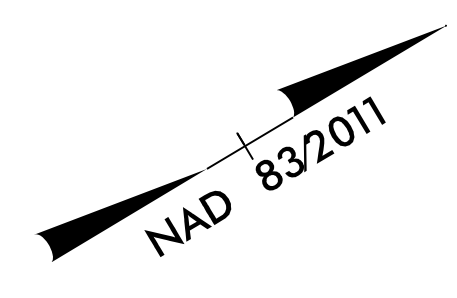


8/17/99  
 REVISIONS  
 25-APR-2019 16:45  
 R:\Hydro\Permits\Environmental\Drawings\Wetland and Stream\_Impacts\R4707\_Hyd\_prm\_wet\_04.dgn  
 21:30mar

PROJECT REFERENCE NO. R-4707	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION	
<b>DOCUMENT NOT CONSIDERED FINAL</b> <b>UNLESS ALL SIGNATURES COMPLETED</b>	
<b>Mead&amp;Hunt</b> <small>111 E. Hargett Street, Suite 300          Raleigh, North Carolina 27601          919-714-8870   meadandhunt.com          NC License No. F-1235</small>	
<b>PERMIT DRAWING</b> <b>SHEET 2 OF 23</b>	



DENOTES IMPACTS IN SURFACE WATER



4  
 STATE OF NORTH CAROLINA  
**SITE 1**  
 24" RCP-III  
 NOT BURIED

MATCHLINE -L- STA. 33 + 50.00 SEE SHEET 5

FOR -RPB- PROFILE, SEE SHEET 18  
 FOR -L- SB PROFILE, SEE SHEET 10  
 FOR -L- NB PROFILE, SEE SHEET 10

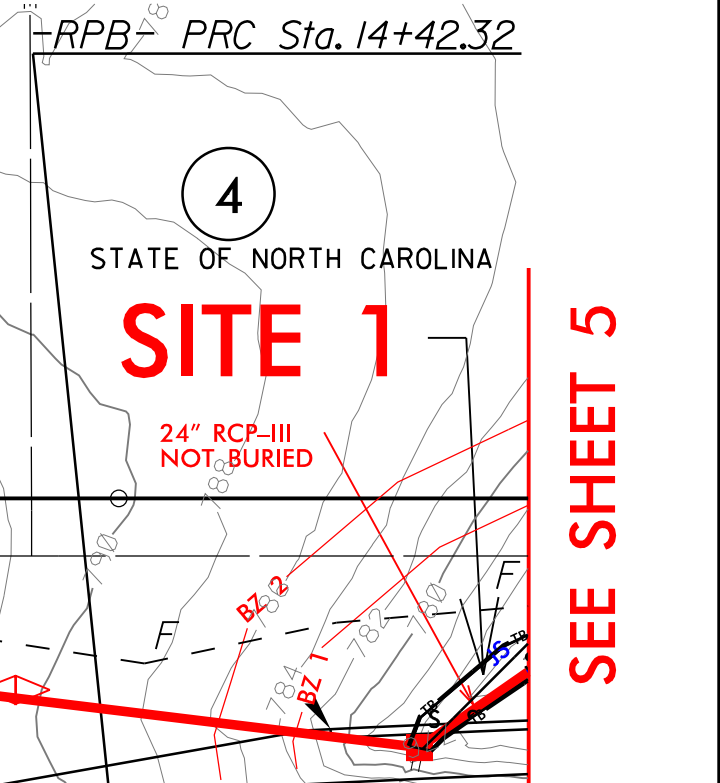


PROJECT REFERENCE NO. R-4707	SHEET NO. 4
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	

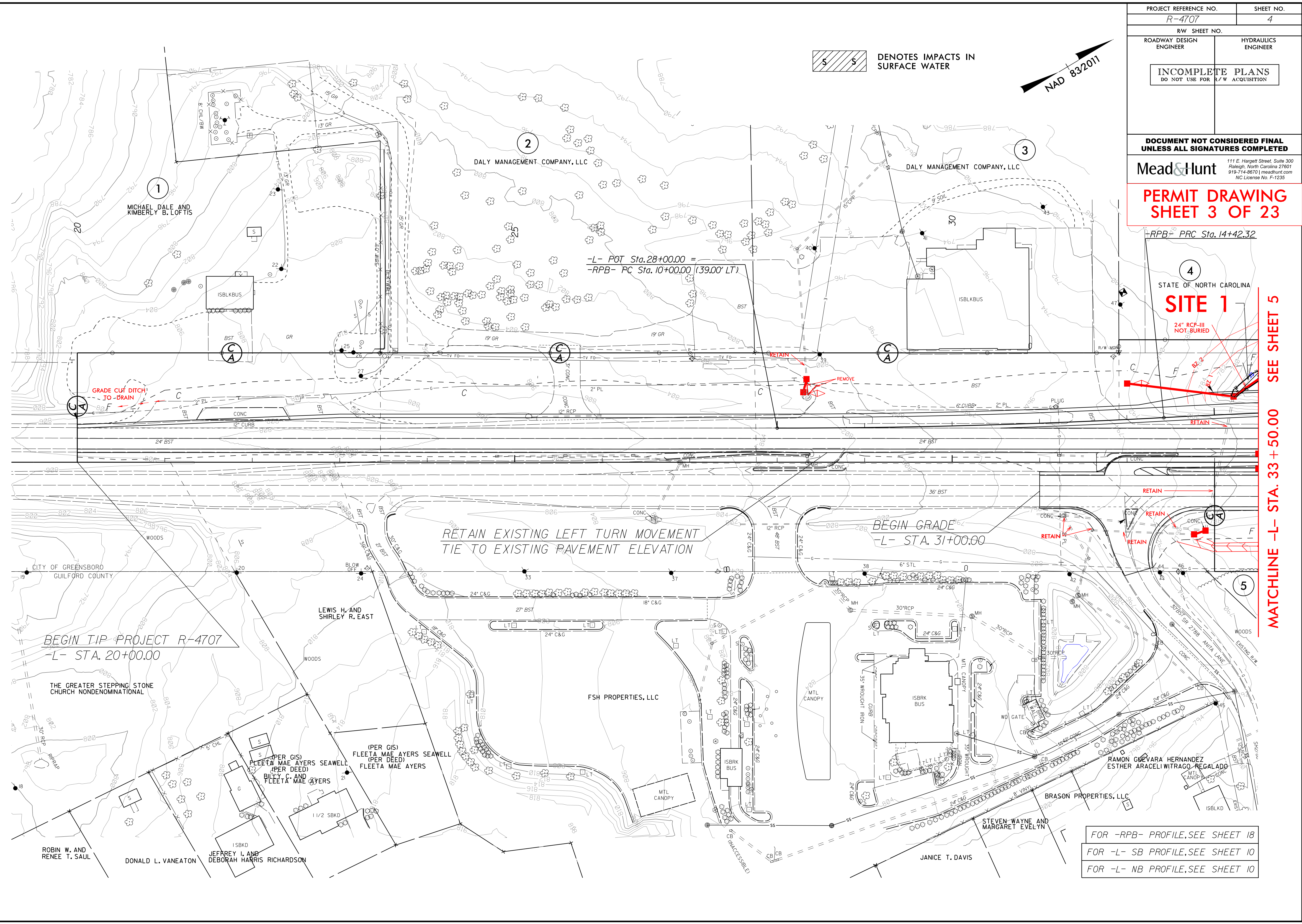
**DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED**

**Mead&Hunt**  
111 E. Hargett Street, Suite 300  
Raleigh, North Carolina 27601  
919-714-8870 | meadandhunt.com  
NC License No. F-1235

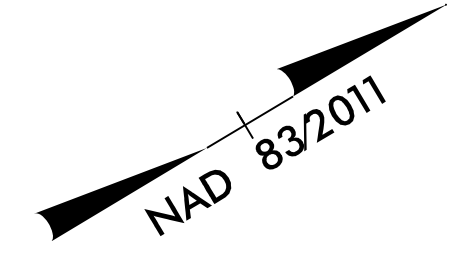
**PERMIT DRAWING  
SHEET 3 OF 23**



REVISIONS



DENOTES IMPACTS IN SURFACE WATER



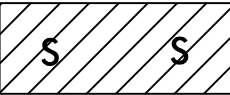
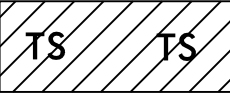
MATCHLINE -L- STA. 33 + 50.00 SEE SHEET 5

FOR -RPB- PROFILE, SEE SHEET 18  
FOR -L- SB PROFILE, SEE SHEET 10  
FOR -L- NB PROFILE, SEE SHEET 10

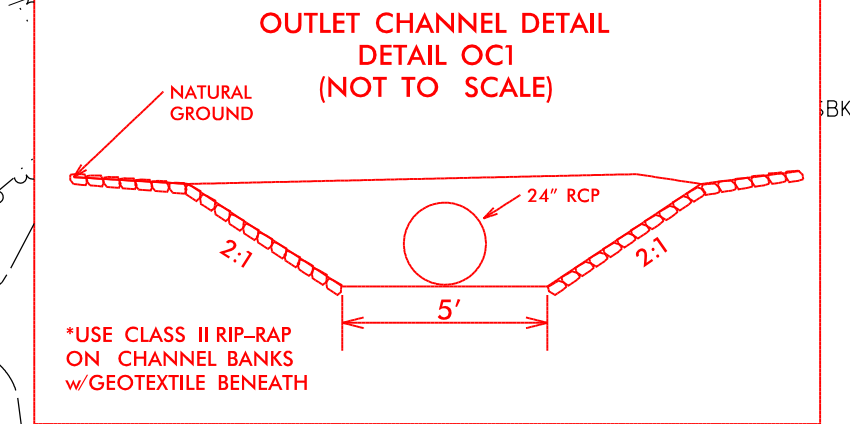
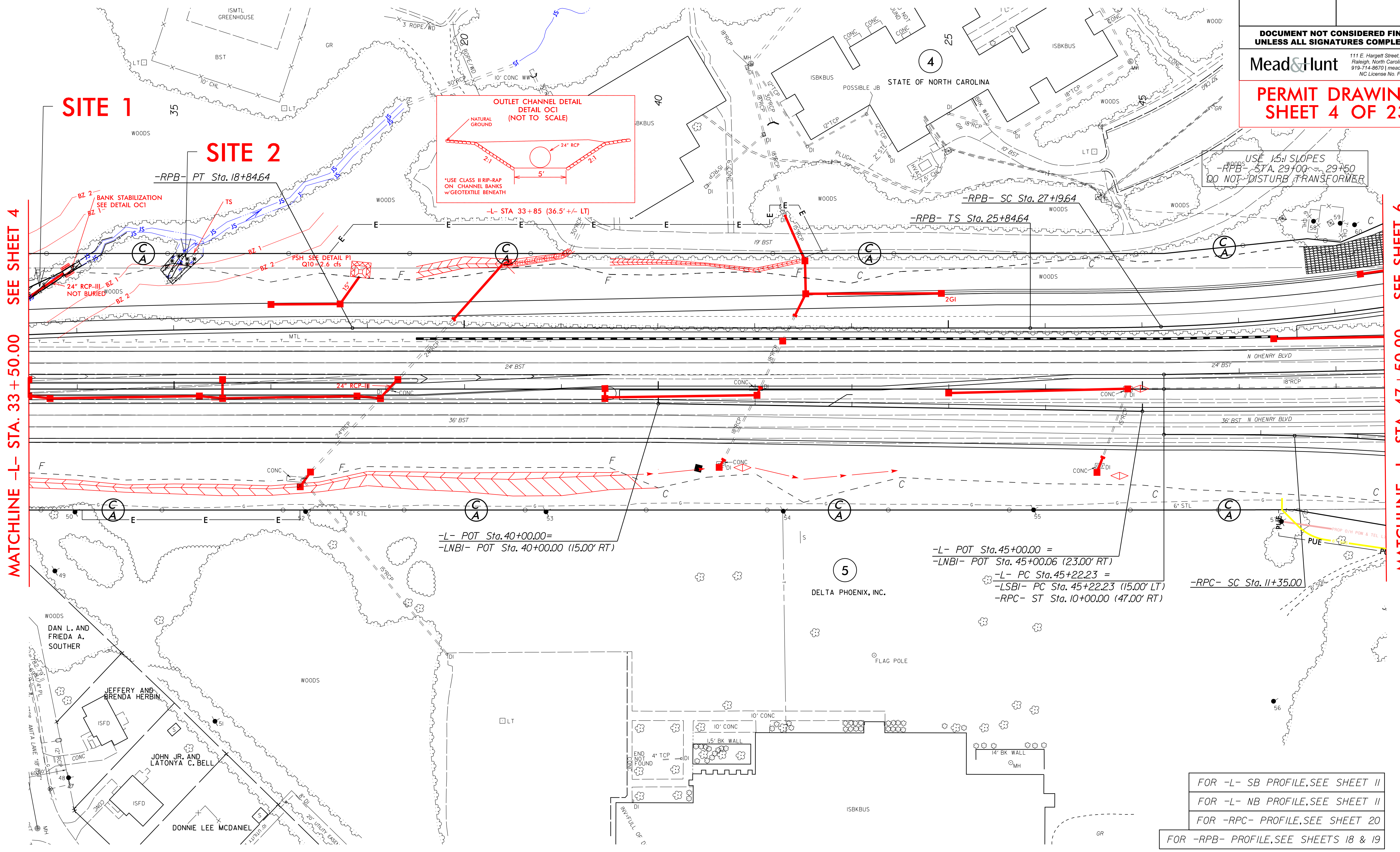
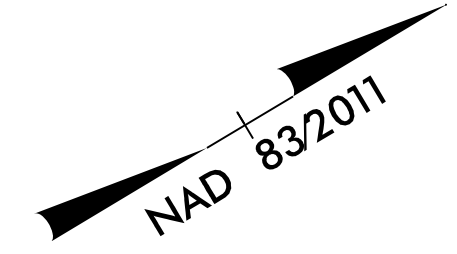
25-APR-2019 16:52  
R:\Hydro\Projects\Permits\Environmental\Drawings\Wetland and Stream\_Impacts\R4707\_Hyd\_prm\_wet\_04\_CON.dgn  
2130mm



25-APR-2019 16:52  
 R:\Hydro\Drawings\Permits\Environmental\Drawings\Wetland and Stream\_Impacts\R4707\_Hyd\_prm\_wet\_05.dgn  
 8/17/99

 DENOTES IMPACTS IN SURFACE WATER	 DENOTES FILL IN WETLAND
 DENOTES TEMPORARY IMPACTS IN SURFACE WATER	 DENOTES MECHANIZED CLEARING

PROJECT REFERENCE NO. R-4707	SHEET NO. 5
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION	
<b>DOCUMENT NOT CONSIDERED FINAL</b> UNLESS ALL SIGNATURES COMPLETED	
<b>Mead&amp;Hunt</b> <small>111 E. Hargett Street, Suite 300          Raleigh, North Carolina 27601          919-714-8870   meadandhunt.com          NC License No. F-1235</small>	
PERMIT DRAWING SHEET 4 OF 23	



USE 1.5:1 SLOPES  
 -RPB- STA. 29+00 ~ 29+50  
 DO NOT DISTURB TRANSFORMER

MATCHLINE -L- STA. 33+50.00 SEE SHEET 4

MATCHLINE -L- STA. 47+50.00 SEE SHEET 6

-L- POT Sta. 40+00.00 =  
 -LNBI- POT Sta. 40+00.00 (15.00' RT)

-L- POT Sta. 45+00.00 =  
 -LNBI- POT Sta. 45+00.06 (23.00' RT)  
 -L- PC Sta. 45+22.23 =  
 -LSBI- PC Sta. 45+22.23 (15.00' LT)  
 -RPC- ST Sta. 10+00.00 (47.00' RT)

-RPC- SC Sta. 11+35.00

FOR -L- SB PROFILE, SEE SHEET 11  
 FOR -L- NB PROFILE, SEE SHEET 11  
 FOR -RPC- PROFILE, SEE SHEET 20  
 FOR -RPB- PROFILE, SEE SHEETS 18 & 19



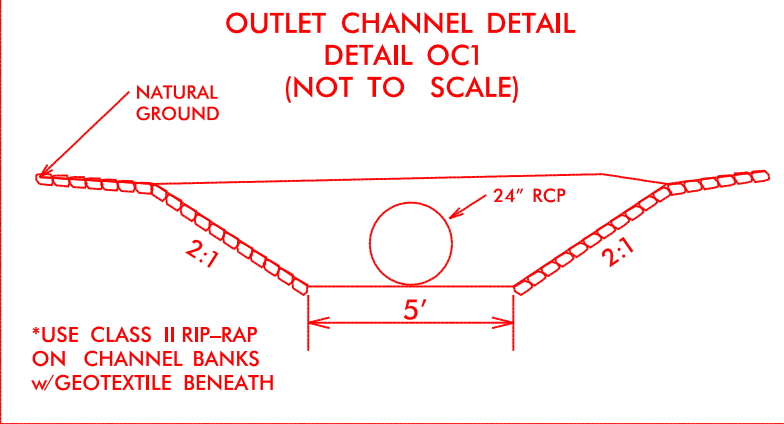
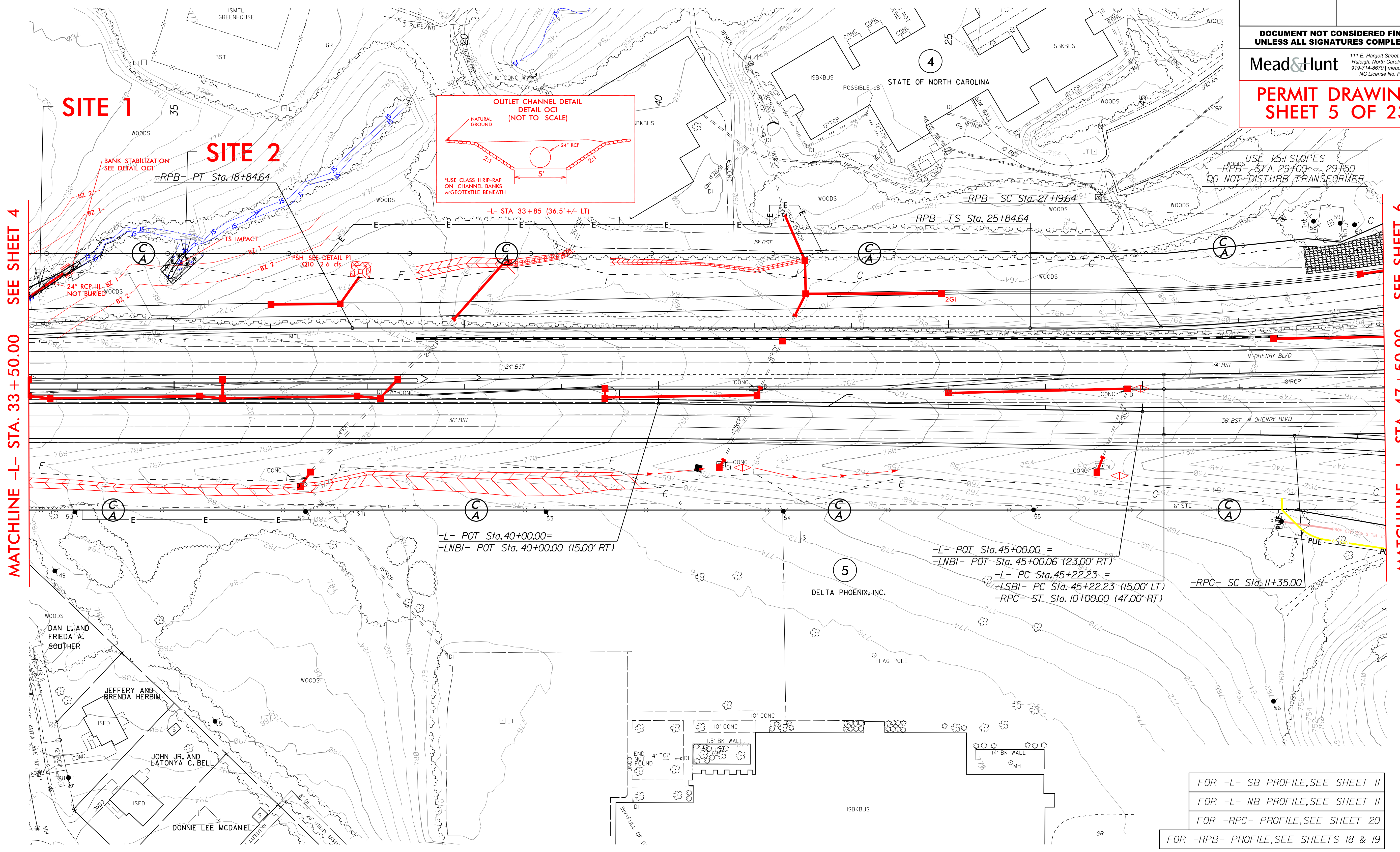
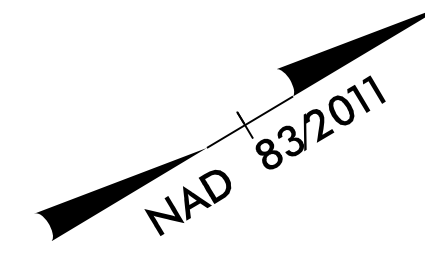
PROJECT REFERENCE NO. R-4707	SHEET NO. 5
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

**Mead&Hunt**  
111 E. Hargett Street, Suite 300  
Raleigh, North Carolina 27601  
919-714-8870 | meadandhunt.com  
NC License No. F-1235

**PERMIT DRAWING  
SHEET 5 OF 23**

-  DENOTES IMPACTS IN SURFACE WATER
-  DENOTES TEMPORARY IMPACTS IN SURFACE WATER
-  DENOTES FILL IN WETLAND
-  DENOTES MECHANIZED CLEARING



USE 1.5:1 SLOPES  
-RPB- STA. 29+00 ~ 29+50  
DO NOT DISTURB TRANSFORMER

MATCHLINE -L- STA. 33+50.00 SEE SHEET 4

MATCHLINE -L- STA. 47+50.00 SEE SHEET 6

-L- POT Sta. 40+00.00 =  
-LNBI- POT Sta. 40+00.00 (15.00' RT)

-L- POT Sta. 45+00.00 =  
-LNBI- POT Sta. 45+00.06 (23.00' RT)  
-L- PC Sta. 45+22.23 =  
-LSBI- PC Sta. 45+22.23 (15.00' LT)  
-RPC- ST Sta. 10+00.00 (47.00' RT)

FOR -L- SB PROFILE, SEE SHEET 11  
FOR -L- NB PROFILE, SEE SHEET 11  
FOR -RPC- PROFILE, SEE SHEET 20  
FOR -RPB- PROFILE, SEE SHEETS 18 & 19

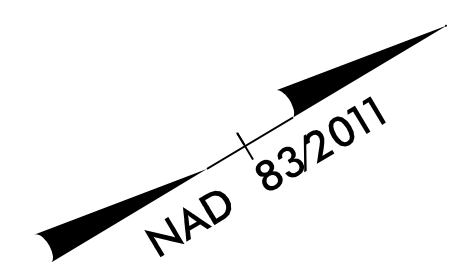
REVISIONS

25-APR-2019 16:52 P:\Hydro\Drawings\Permits\Environmental\Drawings\Wetland and Stream\_Impacts\R4707\_Hyd\_perm\_wet\_05\_CON.dgn



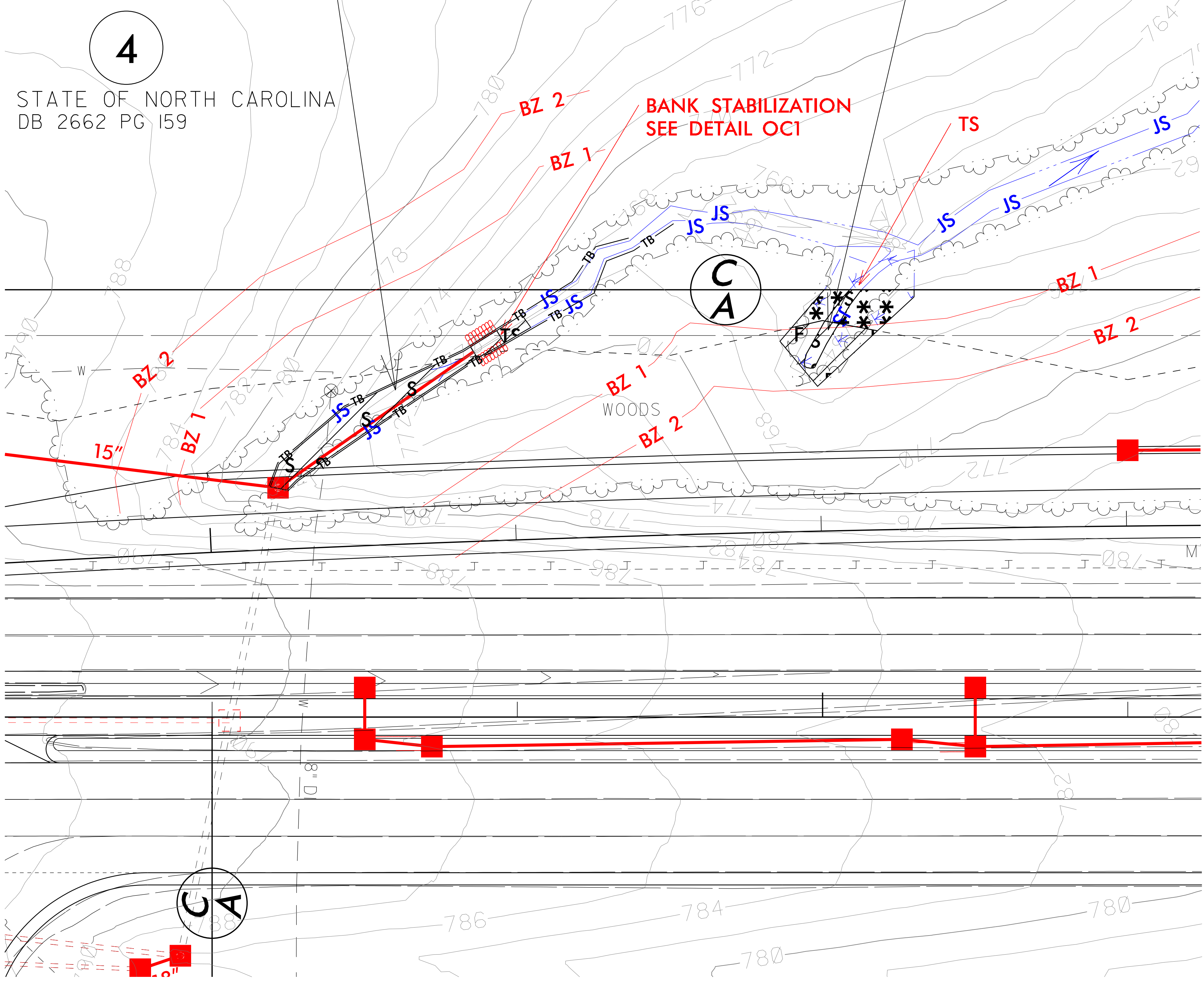
8/17/99

PROJECT REFERENCE NO. R-4707	SHEET NO. INSET: 4,5
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
<b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>	
<b>Mead&amp;Hunt</b> 111 E. Hargett Street, Suite 300 Raleigh, North Carolina 27601 919-714-8670   meadhunt.com NC License No. F-1235	
<b>PERMIT DRAWING SHEET 6 OF 23</b>	



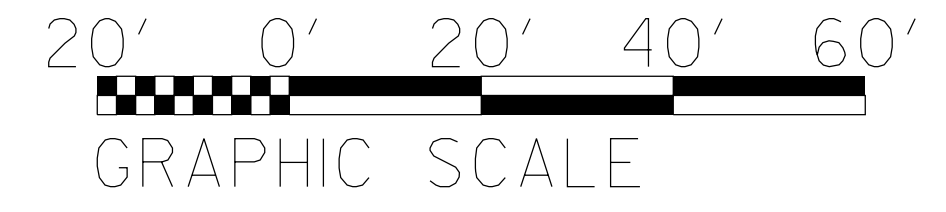
# SITE 1

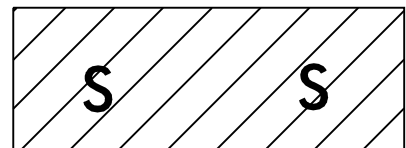
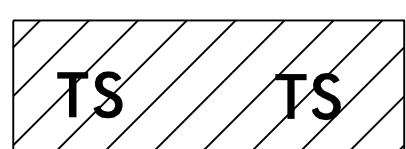
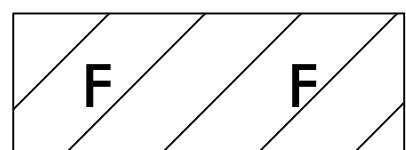
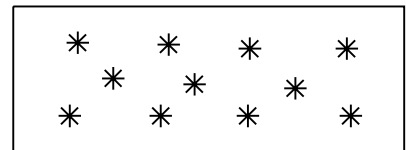
# SITE 2

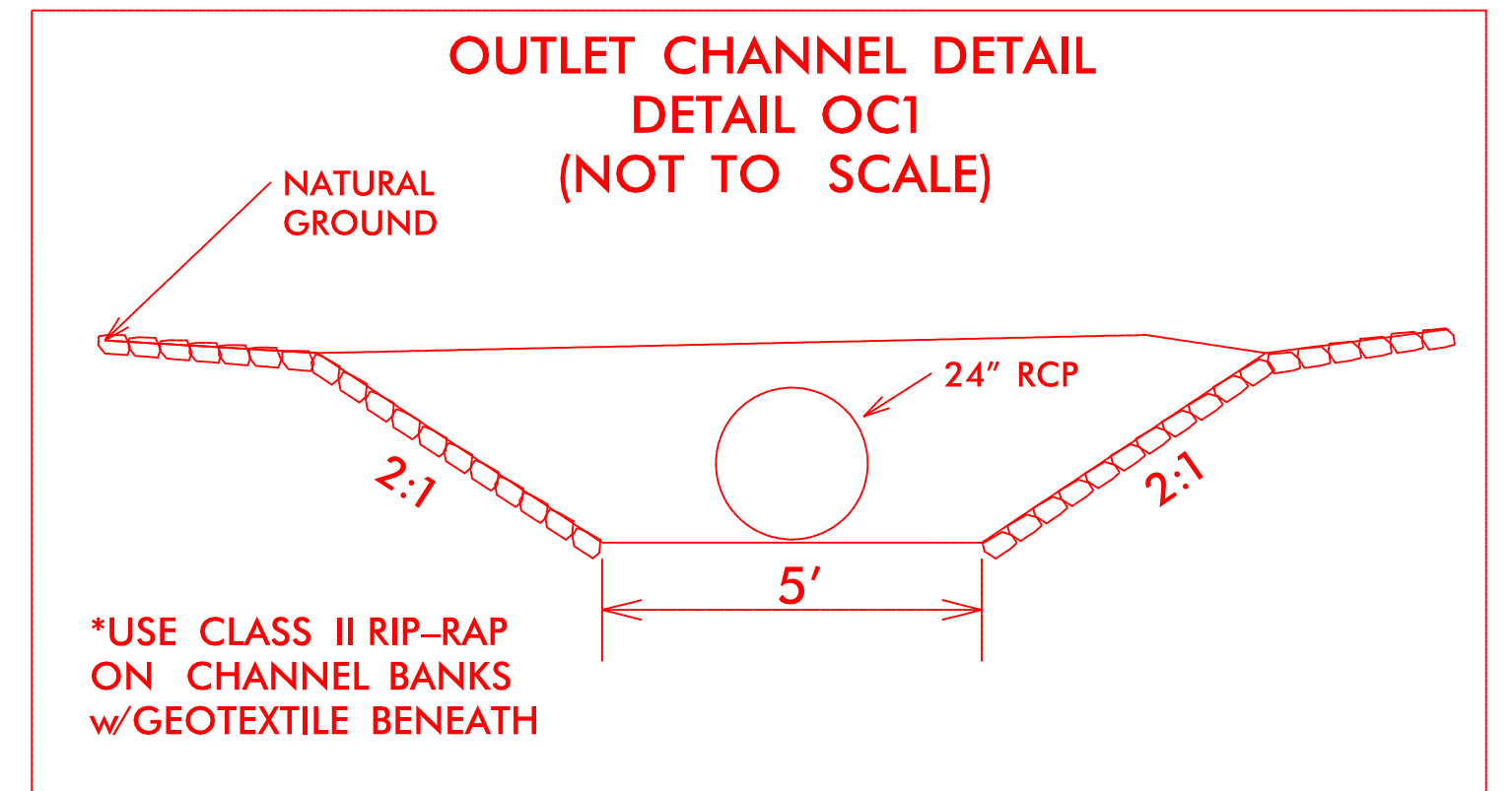


4

STATE OF NORTH CAROLINA  
DB 2662 PG 159



-  DENOTES IMPACTS IN SURFACE WATER
-  DENOTES TEMPORARY IMPACTS IN SURFACE WATER
-  DENOTES FILL IN WETLAND
-  DENOTES MECHANIZED CLEARING



-L- STA 33+85 (36.5' +/- LT)

REVISIONS  
 25-APR-2019 16:52  
 X:\4506200\172319\_01\TECH\Hydraulics\PERMITS\_Environmental\Drawings\Wetland and Stream Impacts\R4707\_Hyd\_prm\_wet\_inset\_01.dgn  
 2130msr











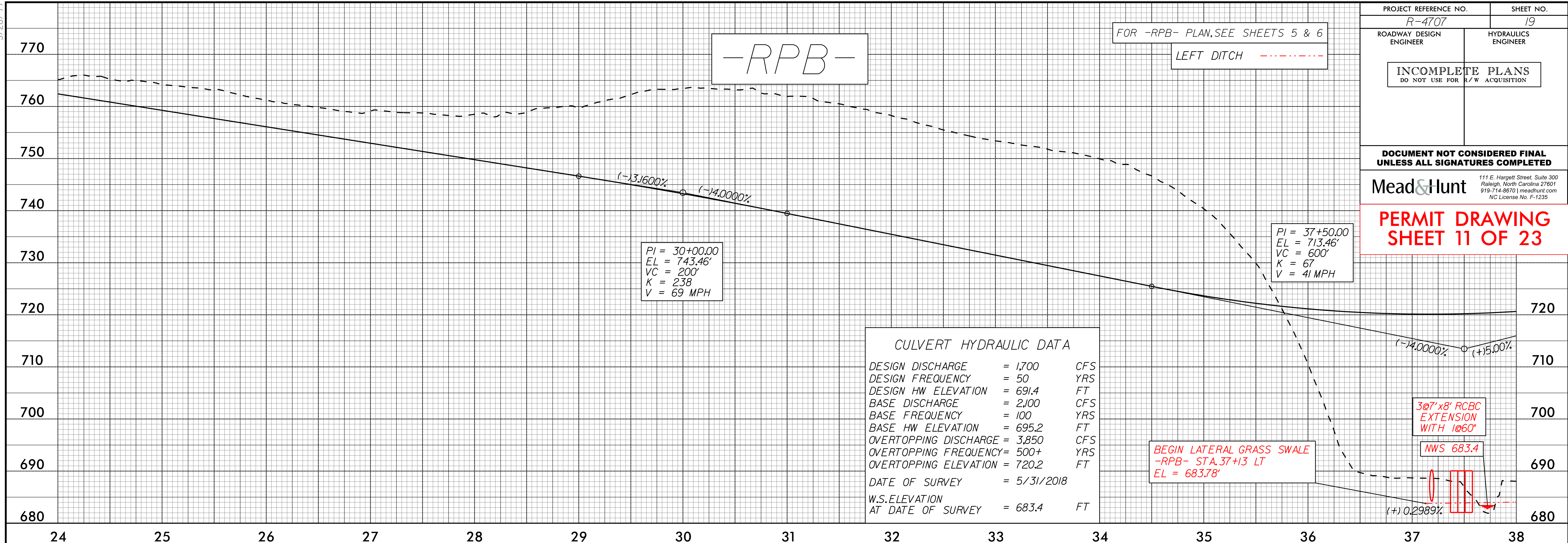






5/28/99

PROJECT REFERENCE NO. R-4707	SHEET NO. 19
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Mead&Hunt <small>111 E. Hargett Street, Suite 300 Raleigh, North Carolina 27601 919-714-8670   meadhunt.com NC License No. F-1235</small>	
PERMIT DRAWING SHEET 11 OF 23	



PI = 30+00.00  
EL = 743.46'  
VC = 200'  
K = 238  
V = 69 MPH

PI = 37+50.00  
EL = 713.46'  
VC = 600'  
K = 67  
V = 41 MPH

CULVERT HYDRAULIC DATA		
DESIGN DISCHARGE	= 1,700	CFS
DESIGN FREQUENCY	= 50	YRS
DESIGN HW ELEVATION	= 691.4	FT
BASE DISCHARGE	= 2,100	CFS
BASE FREQUENCY	= 100	YRS
BASE HW ELEVATION	= 695.2	FT
OVERTOPPING DISCHARGE	= 3,850	CFS
OVERTOPPING FREQUENCY	= 500+	YRS
OVERTOPPING ELEVATION	= 720.2	FT
DATE OF SURVEY	= 5/31/2018	
W.S. ELEVATION AT DATE OF SURVEY	= 683.4	FT

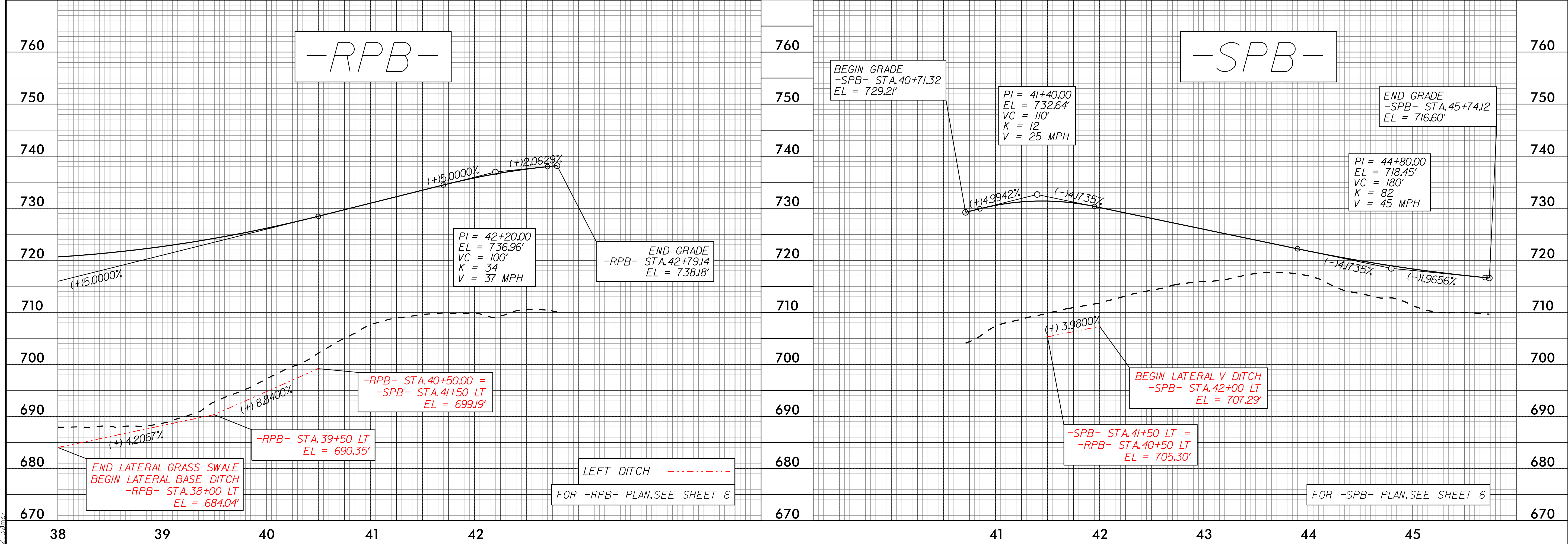
BEGIN LATERAL GRASS SWALE  
-RPB- STA. 37+13 LT  
EL = 683.78'

3@7'x8' RCBC  
EXTENSION  
WITH 1@60'

NWS 683.4

(+) 0.2989%

P:\APR\_2018\_1652  
 P:\Hunt\Projects\ERMITS\_Environmental\Drawings\Wetland and Stream\_Impacts\R4707\_Rdy\_pfl\_19.dgn  
 2/13/2018



PI = 42+20.00  
EL = 736.96'  
VC = 100'  
K = 34  
V = 37 MPH

PI = 41+40.00  
EL = 732.64'  
VC = 110'  
K = 12  
V = 25 MPH

PI = 44+80.00  
EL = 718.45'  
VC = 180'  
K = 82  
V = 45 MPH

END LATERAL GRASS SWALE  
BEGIN LATERAL BASE DITCH  
-RPB- STA. 38+00 LT  
EL = 684.04'

-RPB- STA. 39+50 LT  
EL = 690.35'

-RPB- STA. 40+50.00 =  
-SPB- STA. 41+50 LT  
EL = 699.19'

END GRADE  
-RPB- STA. 42+79.14  
EL = 738.18'

-SPB- STA. 41+50 LT =  
-RPB- STA. 40+50 LT  
EL = 705.30'

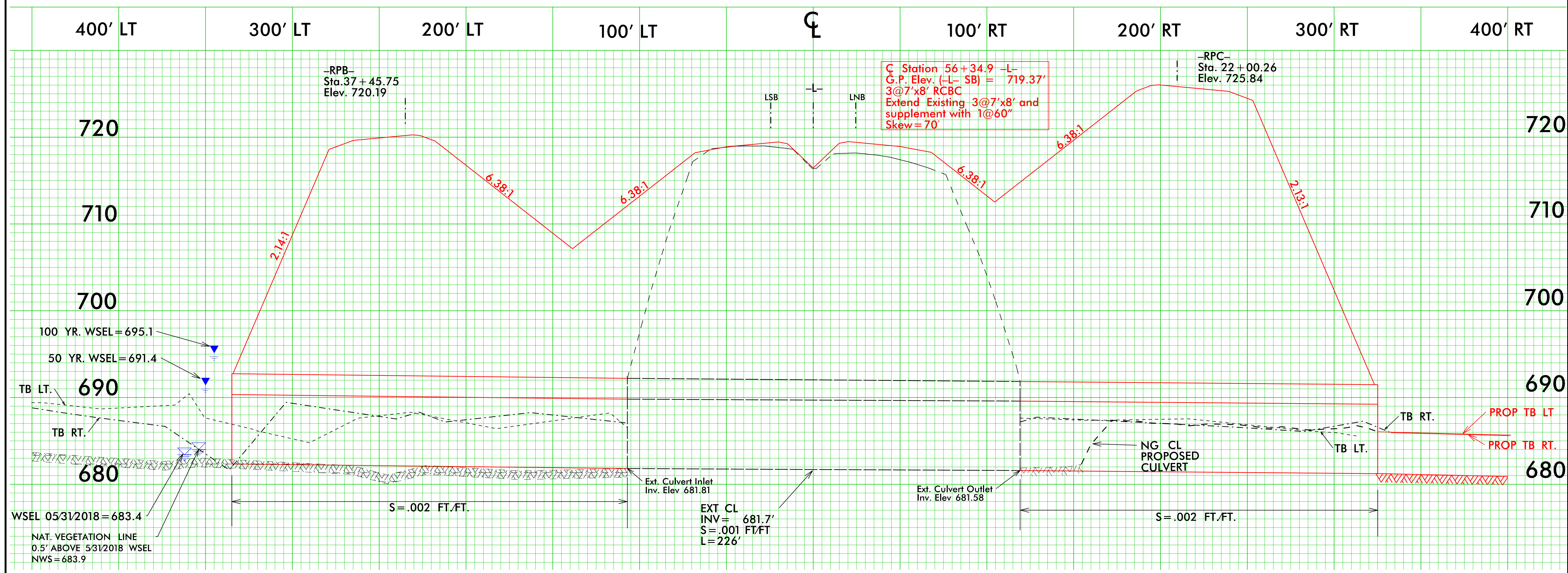
BEGIN LATERAL V DITCH  
-SPB- STA. 42+00 LT  
EL = 707.29'

END GRADE  
-SPB- STA. 45+74.12  
EL = 716.60'

LEFT DITCH  
FOR -RPB- PLAN, SEE SHEET 6

FOR -SPB- PLAN, SEE SHEET 6

PROJECT REFERENCE NO. R-4707	SHEET NO. L PFL
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION	
<b>DOCUMENT NOT CONSIDERED FINAL</b> <b>UNLESS ALL SIGNATURES COMPLETED</b>	
<b>Mead&amp;Hunt</b>	
<small>111 E. Hargett Street, Suite 300          Raleigh, North Carolina 27601          919-714-8870   meadandhunt.com          NC License No. F-1235</small>	
<b>PERMIT DRAWING</b> <b>SHEET 12 OF 23</b>	

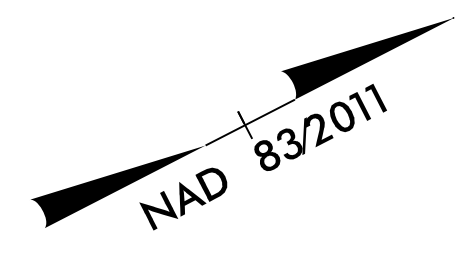
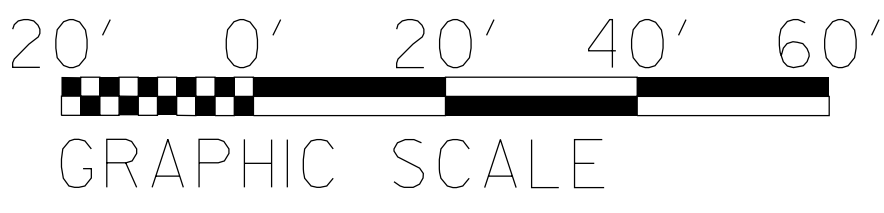


REVISIONS

25-APR-2019 16:52  
 R:\Hydraulics\PERMITS\_Environmental\Drawings\Wetland and Stream Impacts\R4707\_Hyd.prm\_wet\_pfl.dgn  
 2130msr



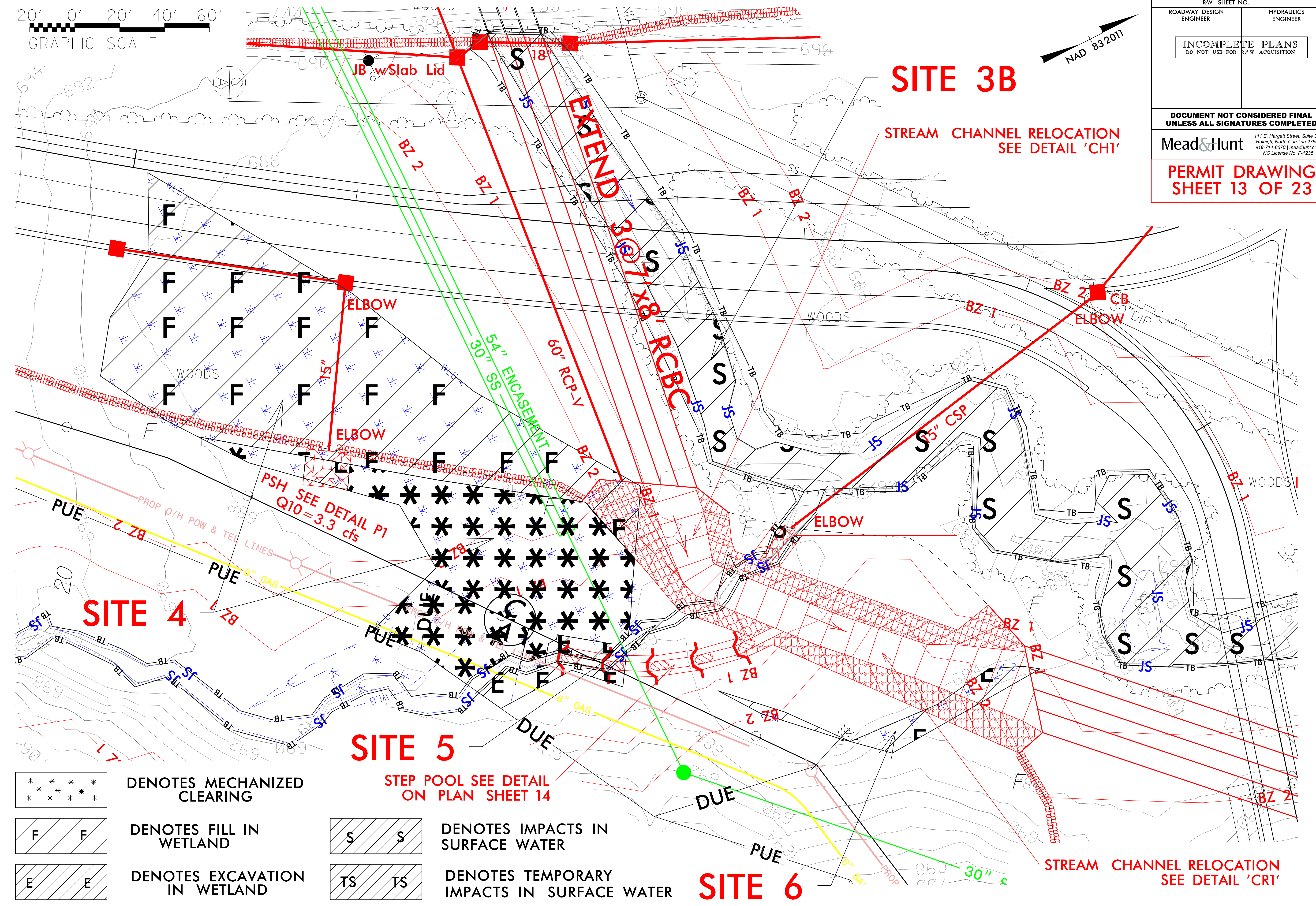
PROJECT REFERENCE NO. R-4707	SHEET NO. INSET: 6B
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Mead&Hunt 111 E. Hargett Street, Suite 300 Raleigh, North Carolina 27601 919-714-8870   meadandhunt.com NC License No. F-1235	
PERMIT DRAWING SHEET 13 OF 23	



# SITE 3B

STREAM CHANNEL RELOCATION  
SEE DETAIL 'CH1'

PERMIT DRAWING  
SHEET 13 OF 23



- DENOTES MECHANIZED CLEARING
- DENOTES FILL IN WETLAND
- DENOTES EXCAVATION IN WETLAND
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER

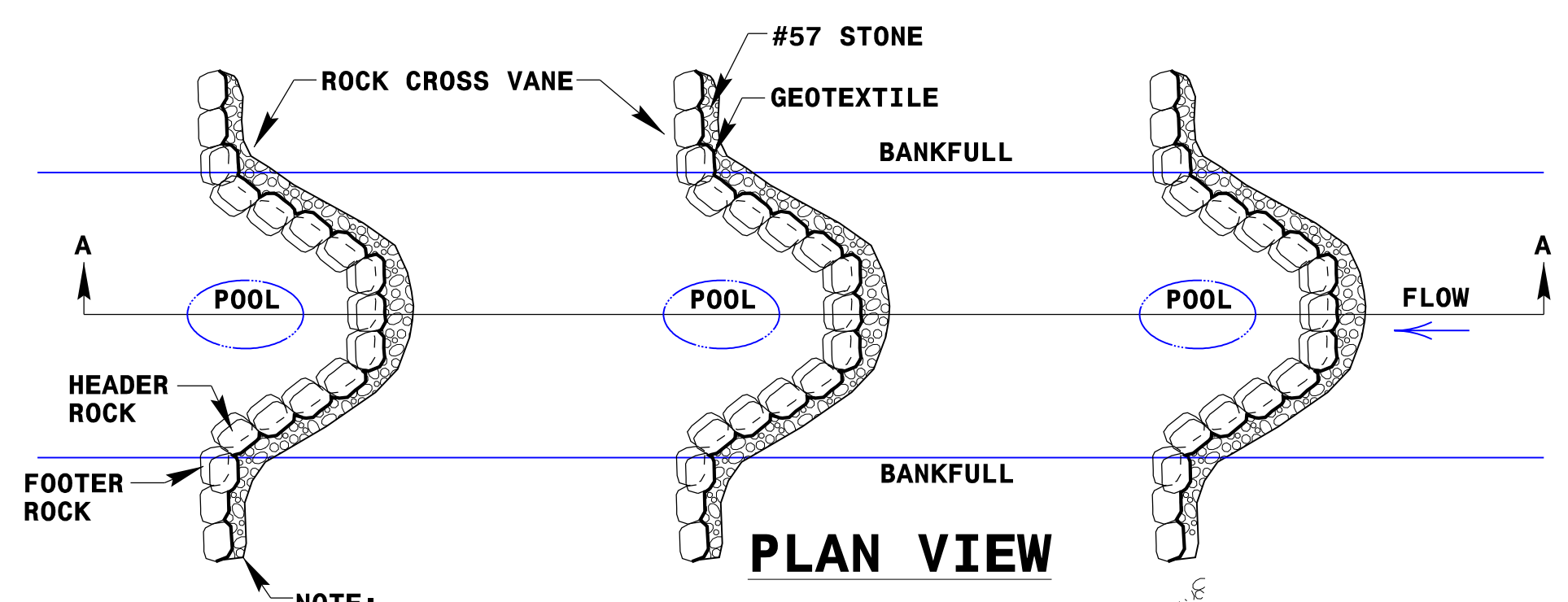
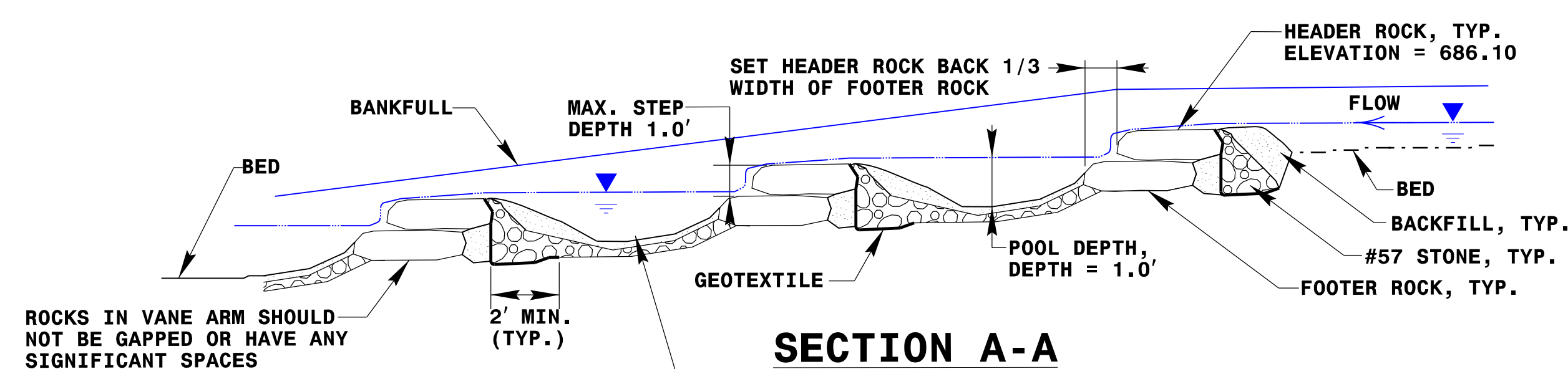
STEP POOL SEE DETAIL  
ON PLAN SHEET 14

# SITE 6

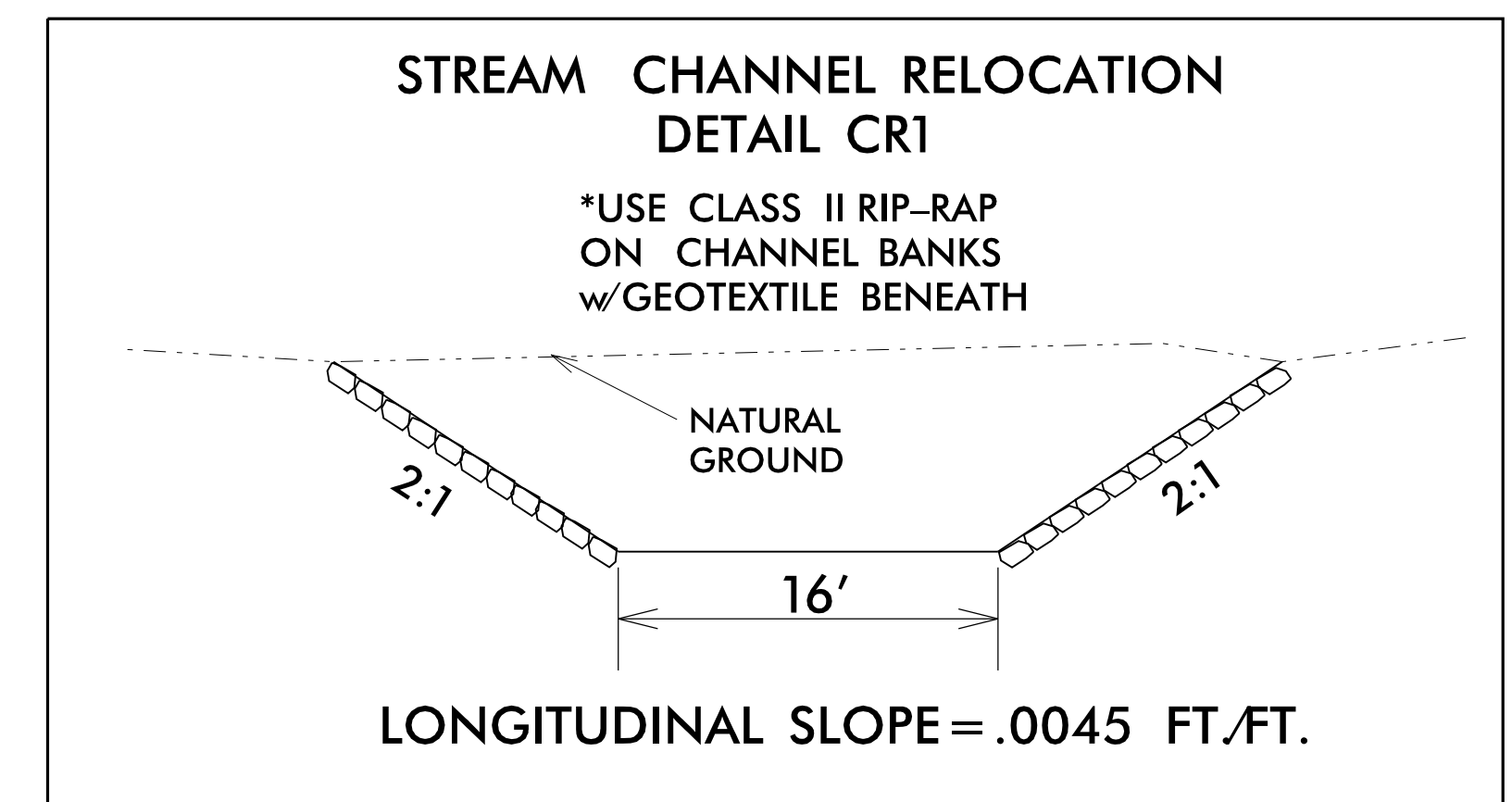
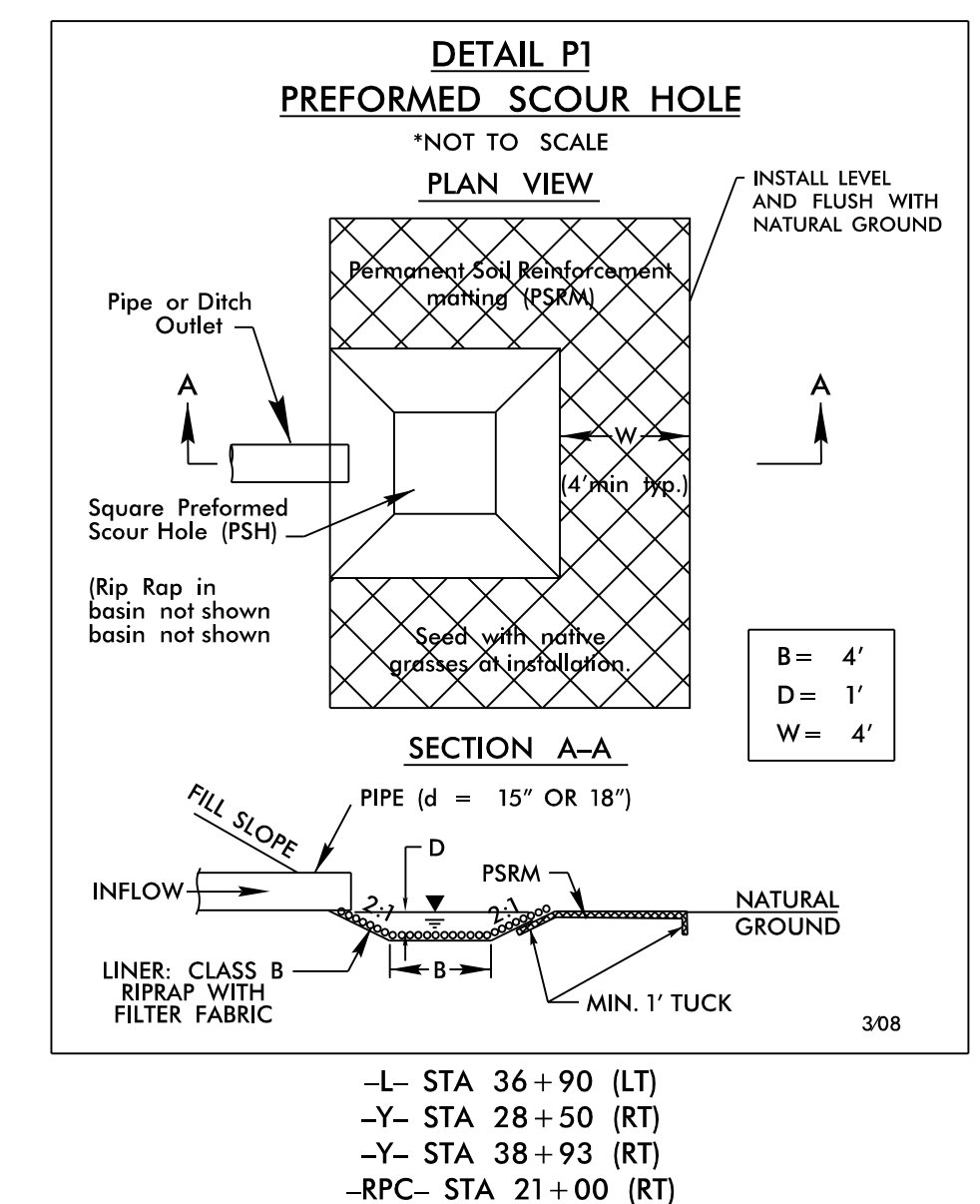
STREAM CHANNEL RELOCATION  
SEE DETAIL 'CR1'

REVISIONS  
 25-APR-2019 16:52  
 X:\4306200\172319.0\TECH\Hydraulics\PERMITS\Environmental\Drawings\Wetland and Stream Impacts\R4707\_Hyd\_prm\_wet\_inset\_03.dgn  
 Z130msr

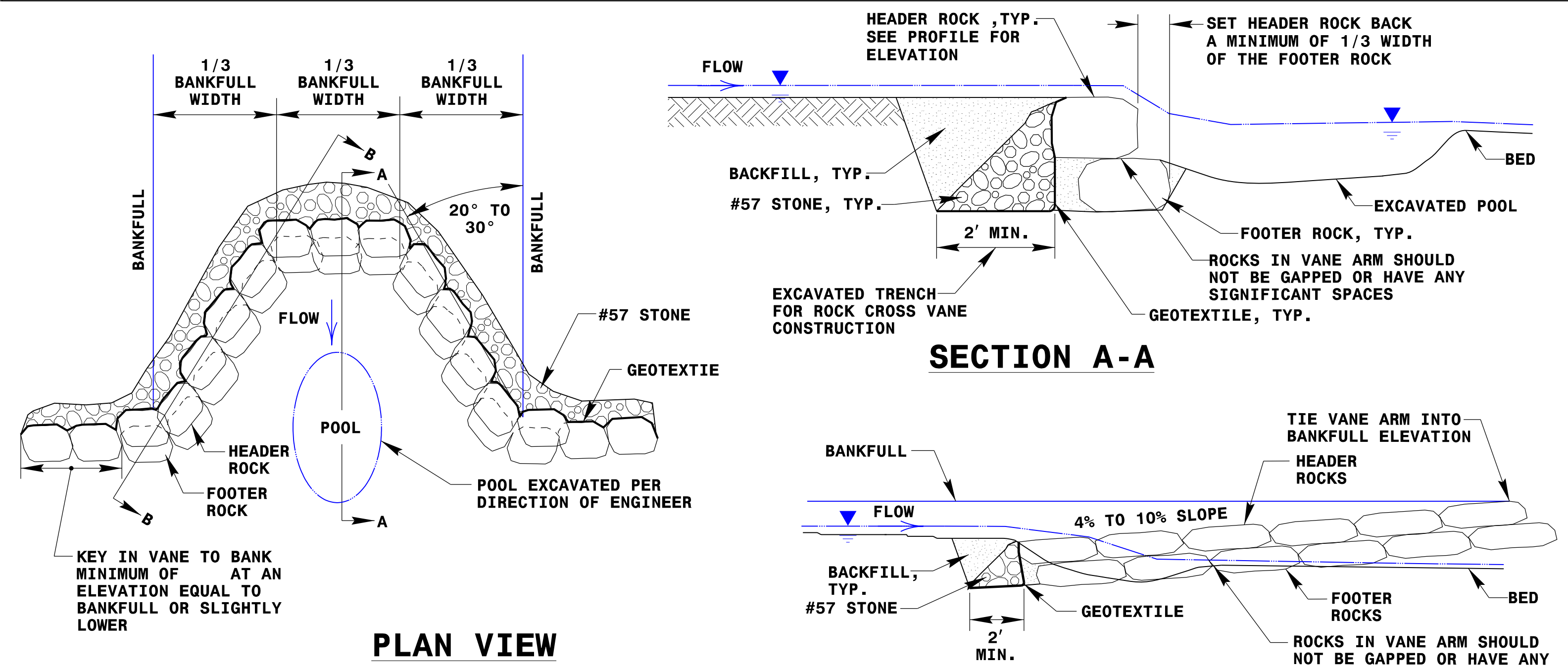




- NOTES:**
1. STEPS TO BE SPACED 18' TO 22' APART.
  2. POOL SPACING SHALL BE INVERSELY PROPORTIONAL TO STREAM SLOPE, AND DIRECTLY PROPORTIONAL TO BANKFULL WIDTH.
  3. POOL DEPTHS AT BANKFULL ELEVATION SHALL BE TYPICALLY 2 TIMES DEEPER THAN STEP DEPTHS AT BANKFULL ELEVATION.
  4. ADEQUATE NUMBER OF FOOTER BOULDERS TO BE USED IN ORDER TO HOLD UP THE BOULDERS AT HEAD OF STEPS DURING HIGH ENERGY/HIGH FLOW EVENTS.
  5. STEP POOL DEPTH SHOULD BE 2 TO 3 TIMES BANKFULL DEPTH.



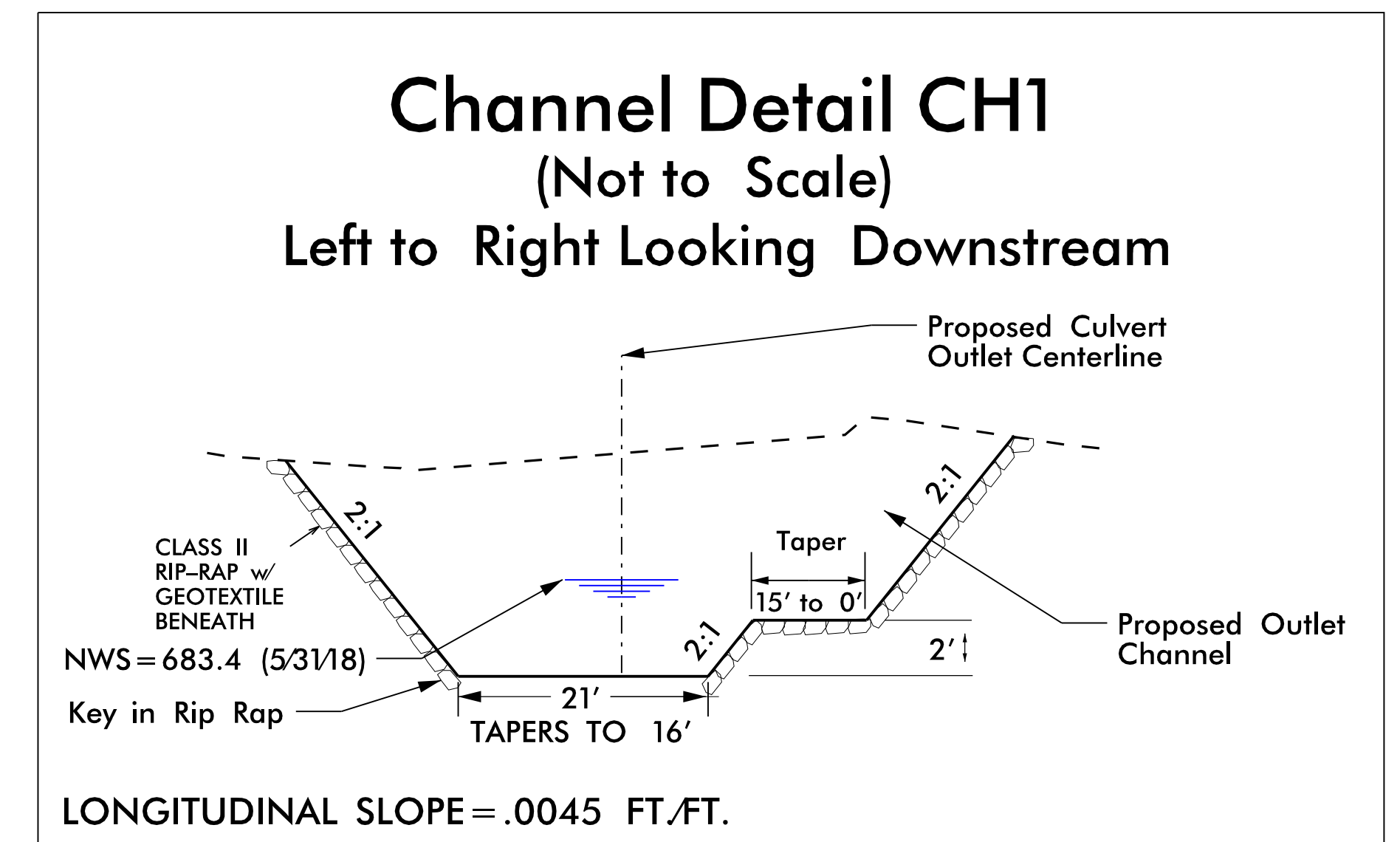
FROM -L- STA. 57+58 (350' RT +/-)  
TO -L- 59+15 (405' RT +/-)



STATION	BOULDER DIMENSIONS (FT)		
	HEIGHT	LENGTH	WIDTH
-	2.0'	3.0'	2.5'

**ROCK CROSS VANE DETAIL FOR STEP POOLS**

- NOTES:**
1. DEEPEST PART OF POOL TO BE IN LINE WITH WHERE VANE ARM TIES INTO BANKFULL.
  2. DO NOT EXCAVATE POOL TOO CLOSE TO FOOTER BOULDERS.
  3. CLASS "A" STONE CAN BE USED TO REDUCE VOIDS BETWEEN HEADERS AND FOOTERS.
  4. COMPACT BACKFILL TO EXTENT POSSIBLE OR AT THE DIRECTION OF THE ENGINEER.
  5. POOL DEPTH SHOULD BE 2 TO 3 TIMES BANKFULL DEPTH.

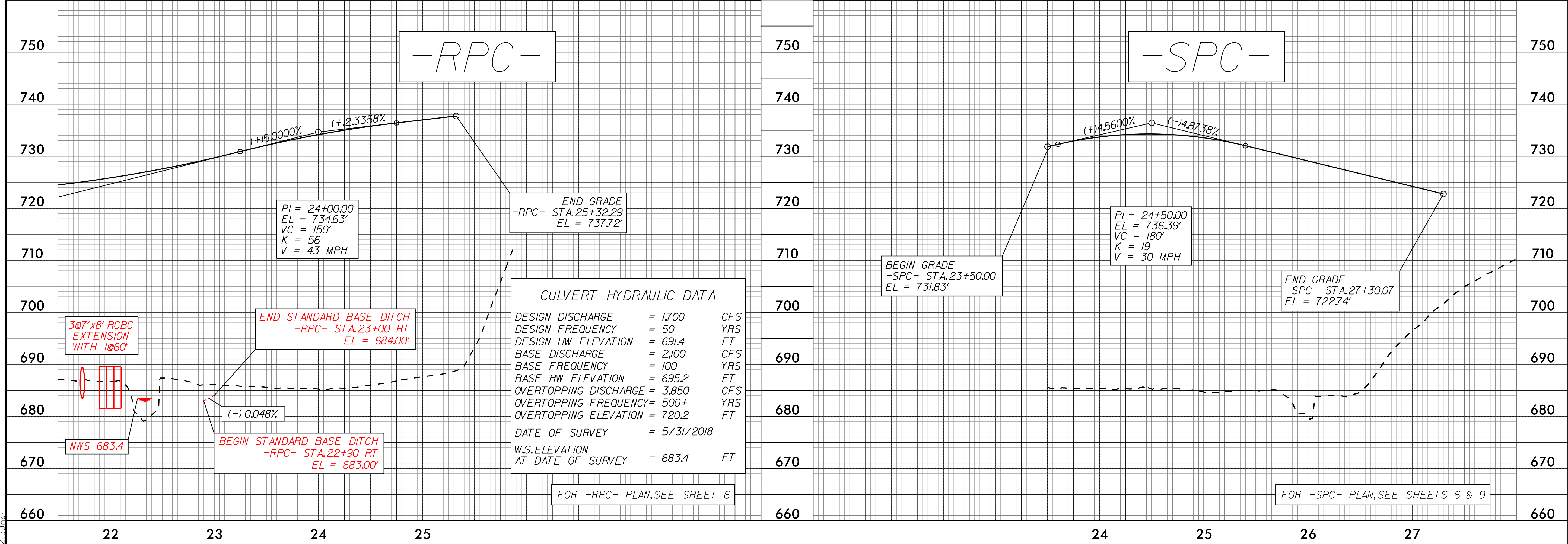
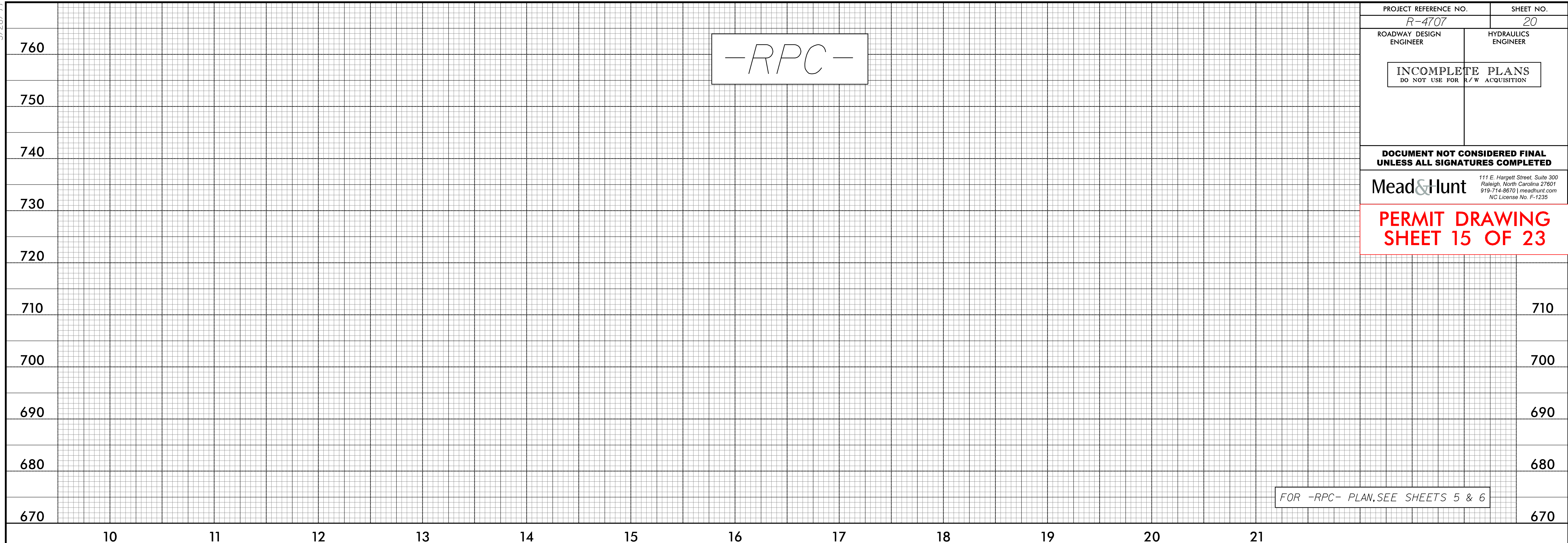


FROM -L- STA. 57+54 (@ CULVERT OUTLET 306' RT)  
TO -L- STA. 57+58 (350' RT +/-)

6/2/99  
25-APR-2019 16:53  
R:\Hydraulics\PERMITS\_Environmental\Drawings\Wetland and Stream Impacts\R4707\_Rdy\_dtl\_2D.dgn  
Z:\30msr

5/28/99

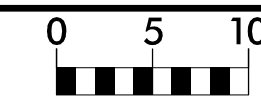
PROJECT REFERENCE NO. R-4707	SHEET NO. 20
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
<b>Mead&amp;Hunt</b> <small>111 E. Hargett Street, Suite 300 Raleigh, North Carolina 27601 919-714-8670   meadhunt.com NC License No. F-1235</small>	
PERMIT DRAWING SHEET 15 OF 23	



P5-APP-2018-16573-Permit-Drawings\Wetland and Stream\_Impacts\R4707\_Rdy\_p1\_20.dgn



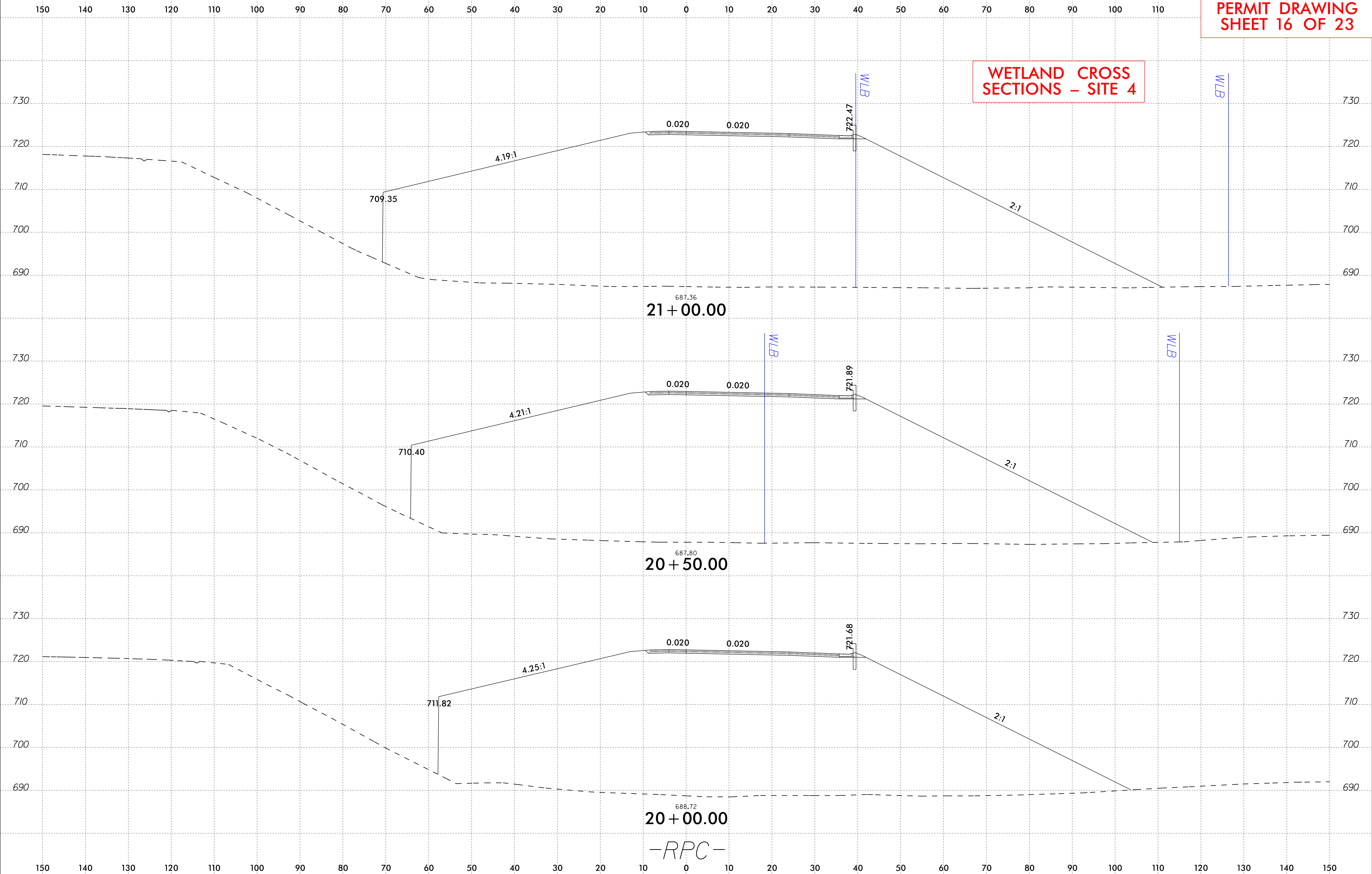
6/23/16  
25-APR-2019 16:53  
D:\hydro\ulics\PERMITS\Environmental\Drawings\Wetland and Stream Impacts\R4707\_Rdy\_xpl\_RPC.dgn  
230m



PROJ. REFERENCE NO. R-4707	SHEET NO. X-72
-------------------------------	-------------------

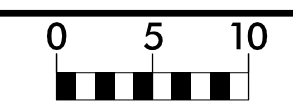
**PERMIT DRAWING  
SHEET 16 OF 23**

**WETLAND CROSS  
SECTIONS - SITE 4**



-RPC-

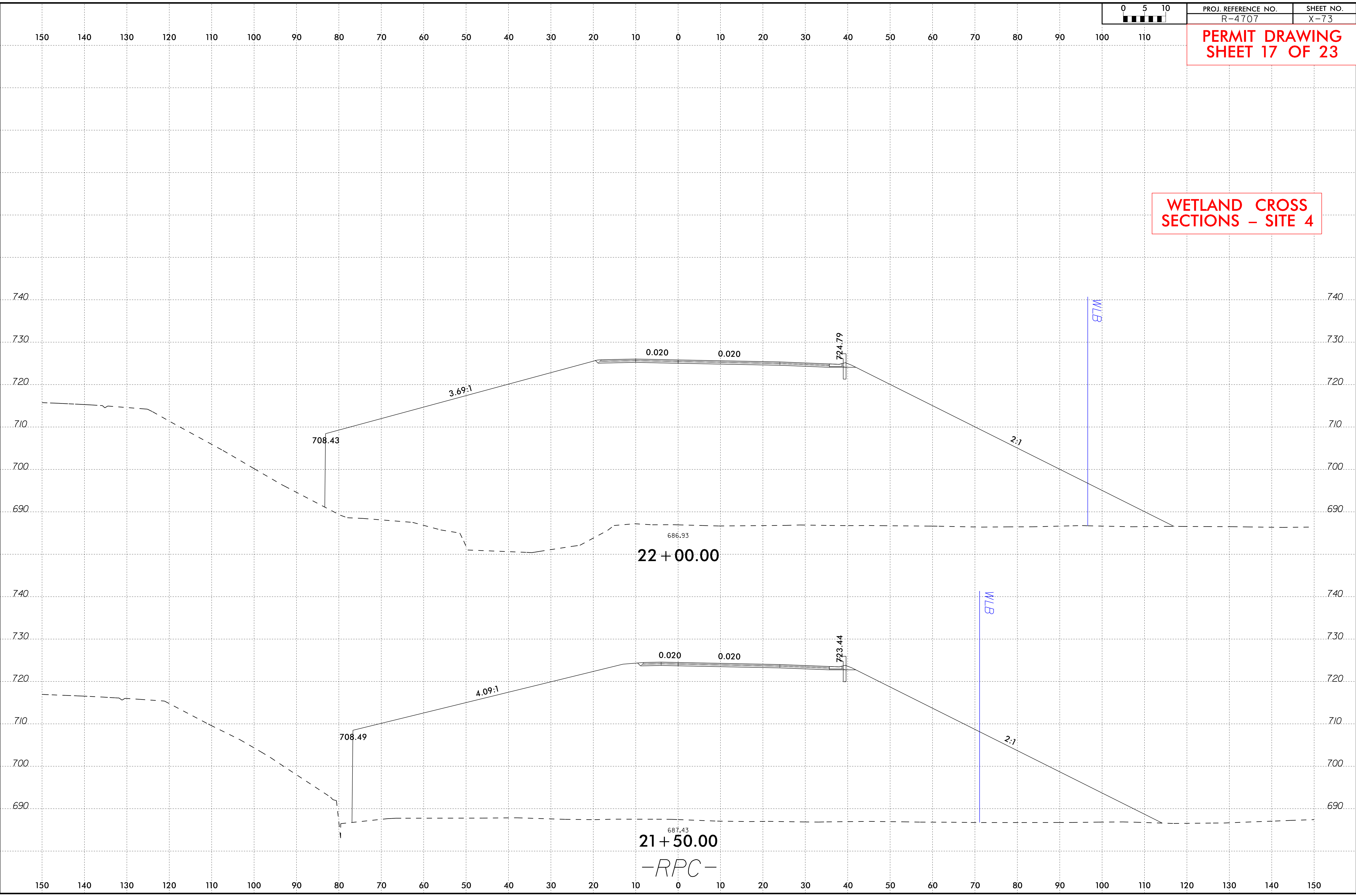
6/23/16  
25-APR-2019 16:53  
D:\hydro\ulics\PERMITS\Environmental\Drawings\Wetland and Stream Impacts\R4707\_Rdy\_xpl\_RPC.dgn  
230m



PROJ. REFERENCE NO. R-4707	SHEET NO. X-73
-------------------------------	-------------------

**PERMIT DRAWING  
SHEET 17 OF 23**

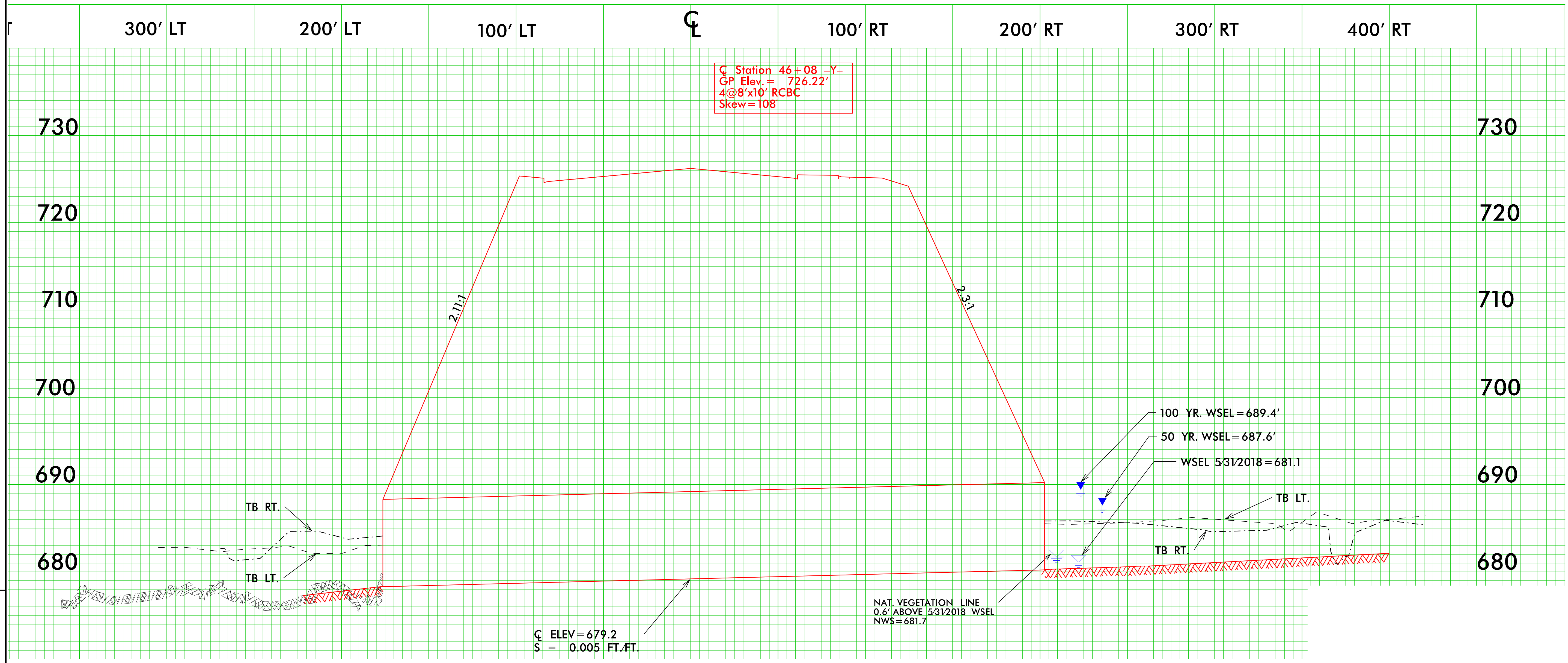
**WETLAND CROSS  
SECTIONS - SITE 4**





PROJECT REFERENCE NO. R-4707	SHEET NO. Y PFL
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION	
<b>DOCUMENT NOT CONSIDERED FINAL</b> <b>UNLESS ALL SIGNATURES COMPLETED</b>	
<b>Mead&amp;Hunt</b>	
<small>111 E. Hargett Street, Suite 300          Raleigh, North Carolina 27601          919-714-8870   meadandhunt.com          NC License No. F-1235</small>	
<b>PERMIT DRAWING</b> <b>SHEET 18 OF 23</b>	

8/17/99  
 REVISIONS  
 25-APR-2019 16:53  
 R:\Hydraulics\PERMITS\_Environmental\Drawings\Wetland and Stream Impacts\R4707\_Hyd\_prm\_wet\_pfl\_Y.dgn  
 Z130msr

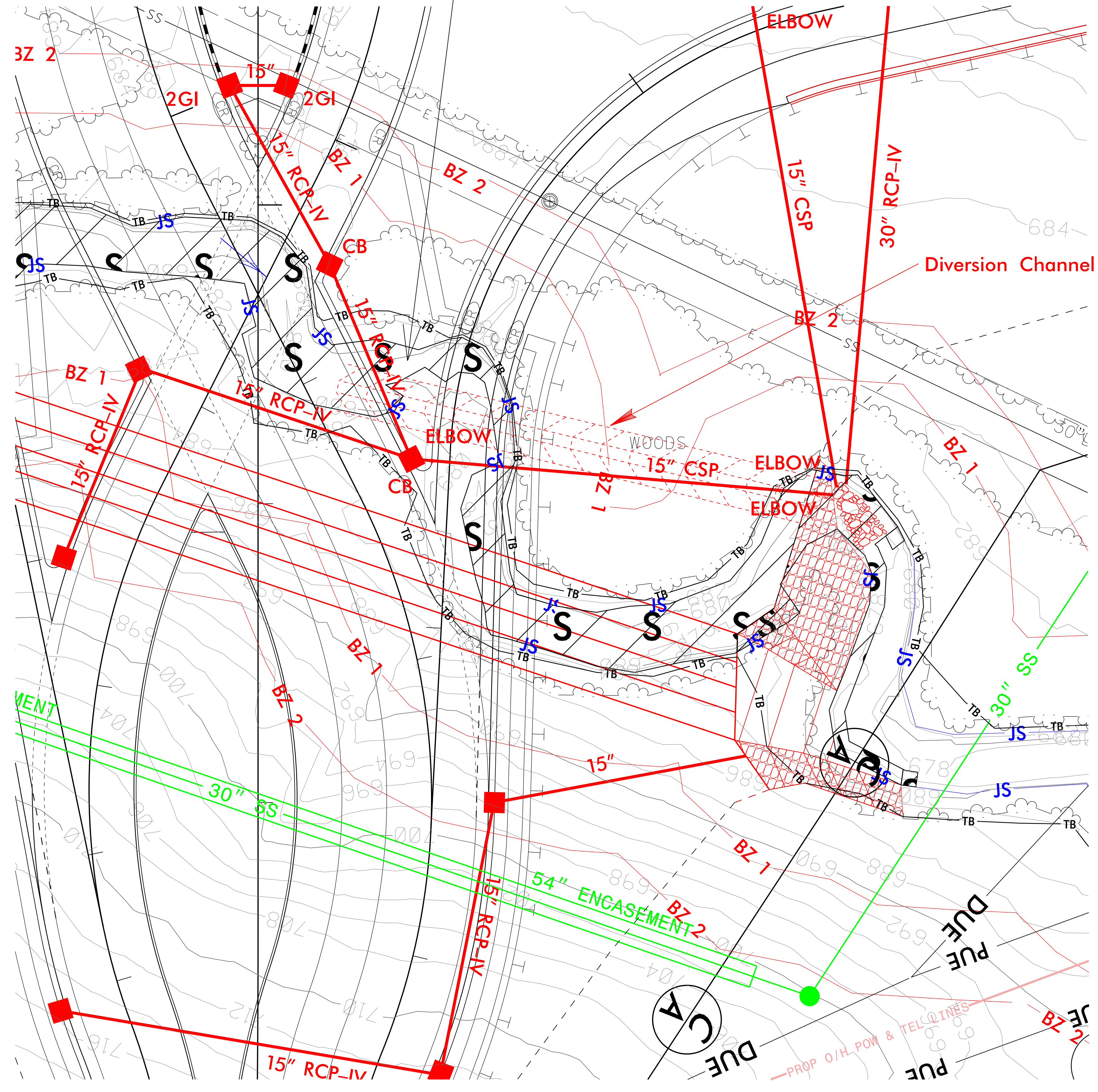




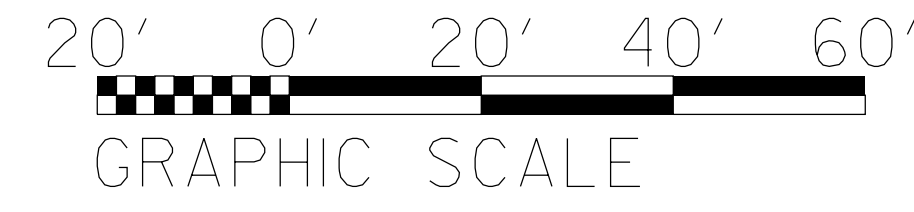
8/17/99

REVISIONS  
25-APR-2019 16:53  
X:\4506200\172319.0\1\TECH\Hydraulics\PERMITS\Environmental\Drawings\Wetland and Stream Impacts\R4707\_Hyd\_prm\_wet\_inset\_04.dgn  
Z:\30msr

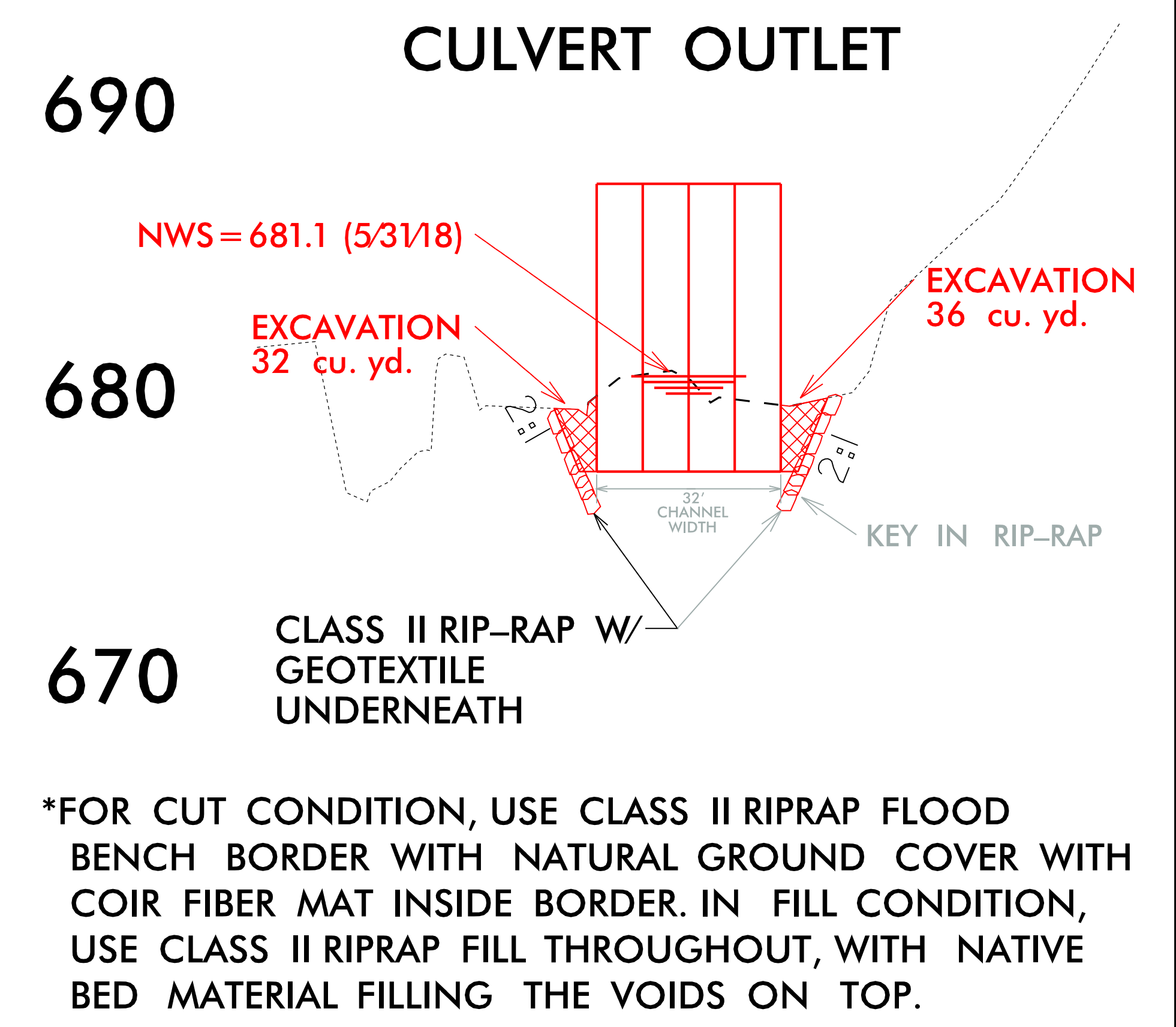
# SITE 3B



PROJECT REFERENCE NO. R-4707	SHEET NO. INSET:6C
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
Mead&Hunt 111 E. Hargett Street, Suite 300 Raleigh, North Carolina 27601 919-714-8870   meadhunt.com NC License No. F-1235	
<b>PERMIT DRAWING SHEET 19 OF 23</b>	



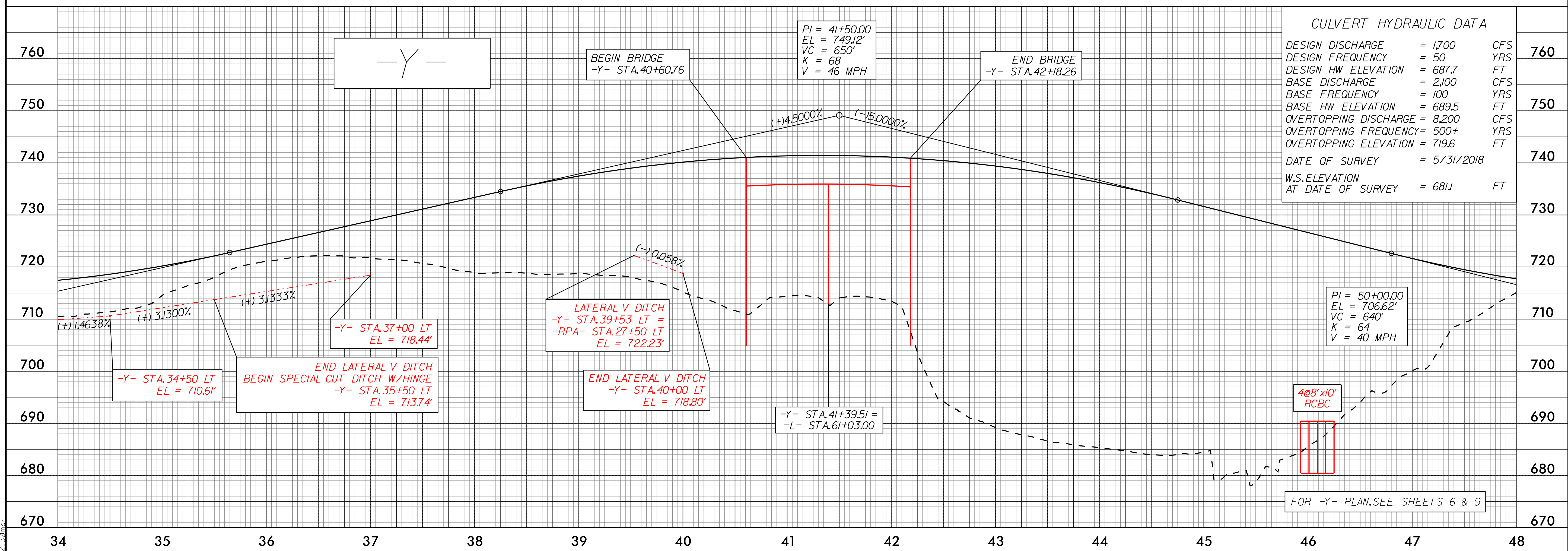
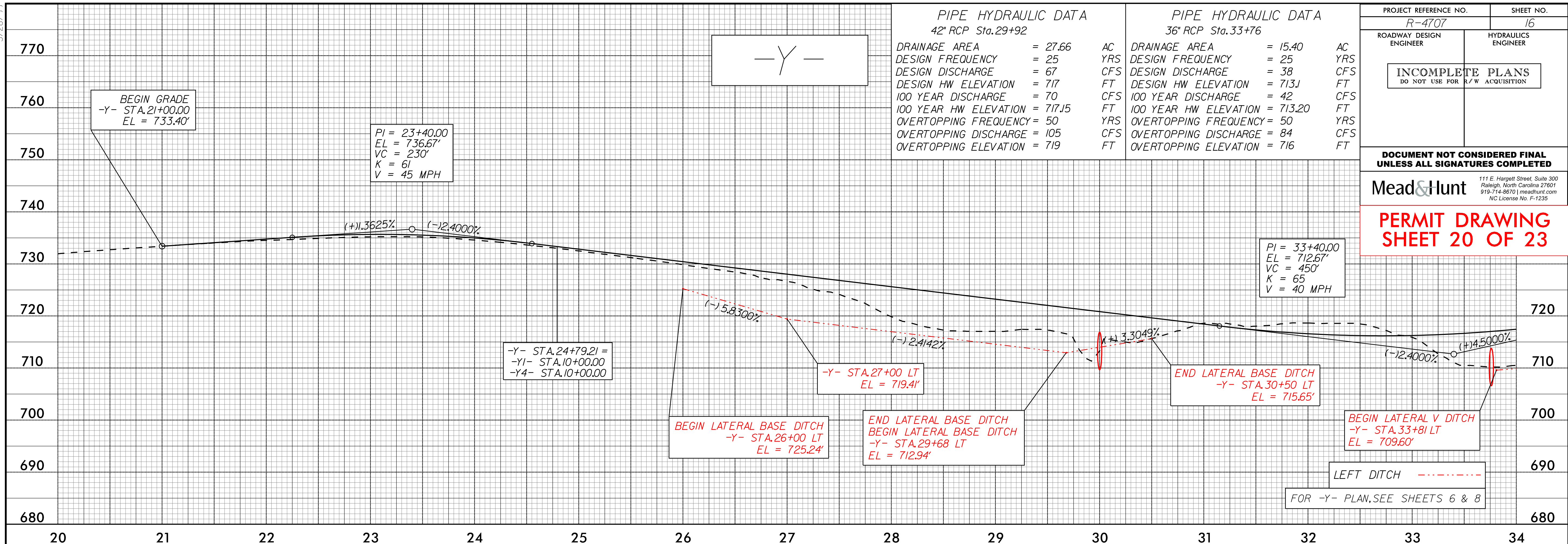
- DENOTES IMPACTS IN SURFACE WATER
- DENOTES TEMPORARY IMPACTS IN SURFACE WATER





5/28/19

05-APP-2019 16573  
R:\Hunt\Projects\ERMITs\_Environmental\Drawings\Wetland and Stream\_Impacts\R4707\_Rdy\_pfl\_16.dgn  
2/13/2019

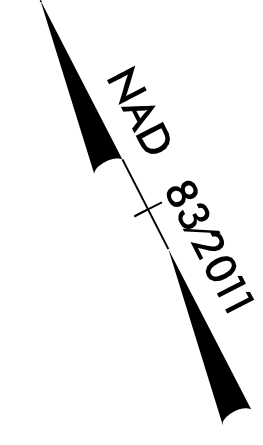








PROJECT REFERENCE NO. R-4707	SHEET NO. 9
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION	
<b>DOCUMENT NOT CONSIDERED FINAL</b> UNLESS ALL SIGNATURES COMPLETED	
<b>Mead&amp;Hunt</b> 111 E. Hargett Street, Suite 300 Raleigh, North Carolina 27601 919-714-8870   meadandhunt.com NC License No. F-1235	
<b>PERMIT DRAWING</b> <b>SHEET 22 OF 23</b>	

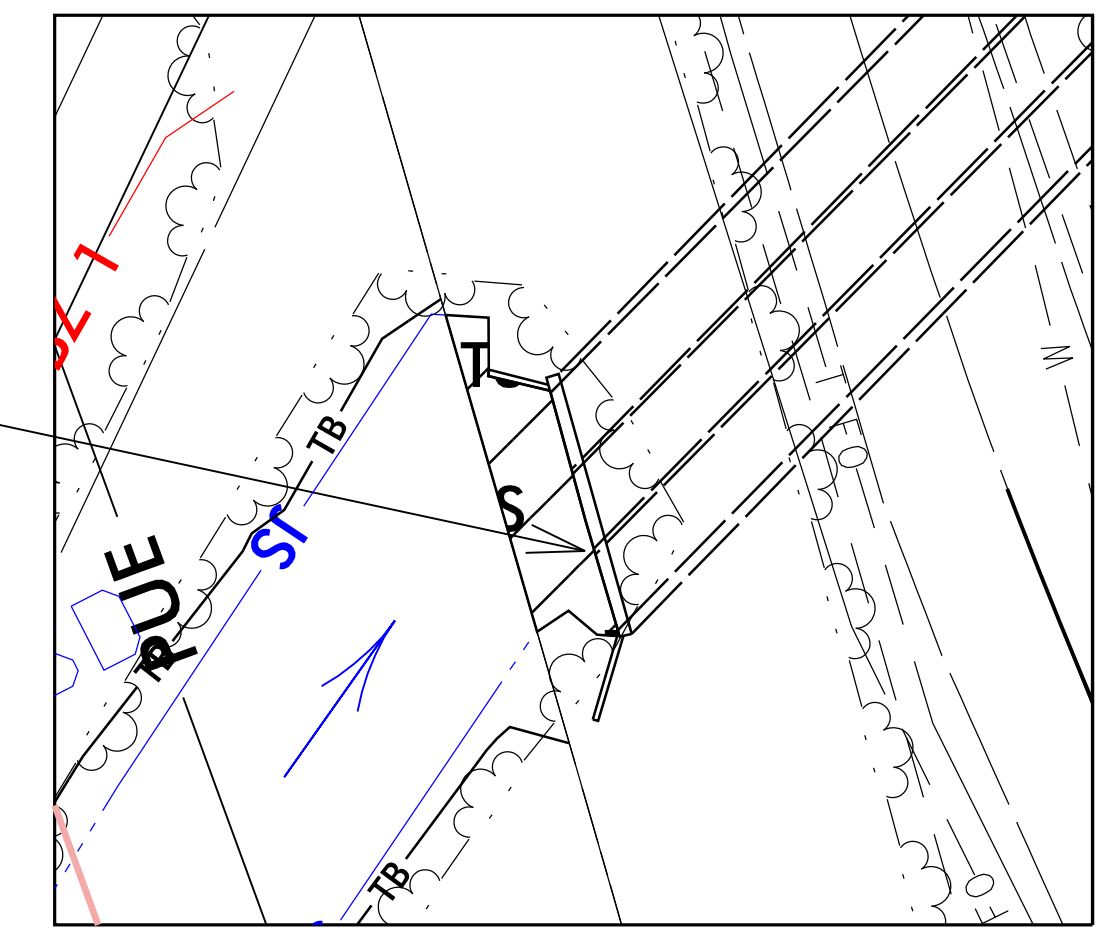


# SITE 3C

DENOTES TEMPORARY IMPACTS IN SURFACE WATER

## SITE 3C

Existing Culvert Barrel has 5'± of Blockage in right barrel (looking downstream) due to sediment.  
 Recommend:  
 Removal of Sediment in left and center barrels from upstream side only and leaving 1' of sediment in right barrel.



MATCHLINE -Y- STA. 47 + 00.00 SEE SHEET 6

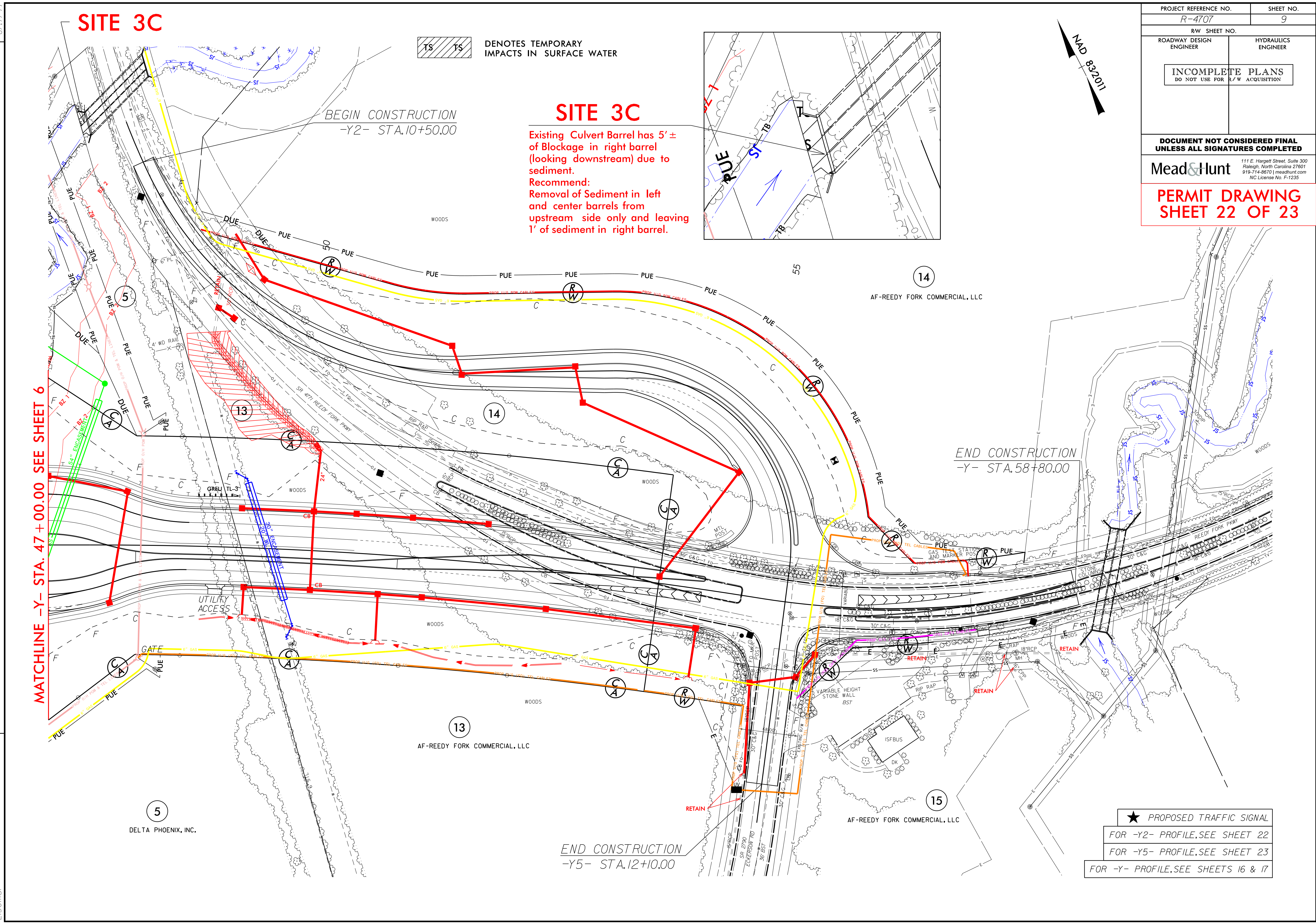
BEGIN CONSTRUCTION  
-Y2- STA.10+50.00

END CONSTRUCTION  
-Y- STA.58+80.00

END CONSTRUCTION  
-Y5- STA.12+10.00

REVISIONS

25-APR-2019 16:53 R:\Hydraulics\PERMITS\_Environmental\Drawings\Wetland and Stream Impacts\R4707\_Hyd\_prm\_wet\_09.dgn Z130msr



- ★ PROPOSED TRAFFIC SIGNAL
- FOR -Y2- PROFILE, SEE SHEET 22
- FOR -Y5- PROFILE, SEE SHEET 23
- FOR -Y- PROFILE, SEE SHEETS 16 & 17



## 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- Sta. 33+19 - 33+86	24" RCP III						0.01		79		
1	-L- Sta. 33+86 - 34+00	Bank Stabilization						< 0.01	< 0.01	10	10	
2	-L- Sta. 34+86 - 35+30	Fill	< 0.01			< 0.01		< 0.01	< 0.01	17	13	
3A	-RPB- Sta. 36+62 - 38+03	3 @ 7' x 8' RCBC Extension						0.14		287		
3A	-RPB- Sta. 36+82 - 37+16	Bank Stabilization						0.02	0.03	101	10	
3B	-RPC- Sta. 21+50	3 @ 7' x 8' RCBC Extension						0.43		953		
	to -Y- Sta. 46+56	and 4 @ 8' x 10' RCBC										
3B	-Y- Sta. 45+89 - 46+95	Bank Stabilization						0.03	< 0.01	122	5	
3C	-Y2- Sta. 10+00	Sediment Removal (RCBC)							< 0.01		8	
4	-RPC- Sta. 20+01 - 22+35	Fill, PSH, Step Pool	0.34		0.02	0.14						
4	-RPC- Sta. 21+28 - 21+93	Utilities Relocation				0.03						
5	-RPC- Sta. 20+01 - 22+36	Channel Relocation, Step Pool						0.02	< 0.01	156	12	
6	-Y- Sta. 45+32 - 45+70	Channel Relocation			0.02							
<b>TOTALS*:</b>			0.35		0.04	0.17		0.65	0.04	1724	58	0

\*Rounded totals are sum of actual impacts

NOTES:  
 3A - TEMPORARY SURFACE WATER IMPACT IS WITHIN THE BANK STABILIZATION IMPACT  
 6 - TOTAL TAKE DUE TO EXCAVATION

NC DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS  
 APRIL 3, 2019  
 GUILFORD  
 R-4707  
 36599.1.5  
 SHEET 23 OF 23

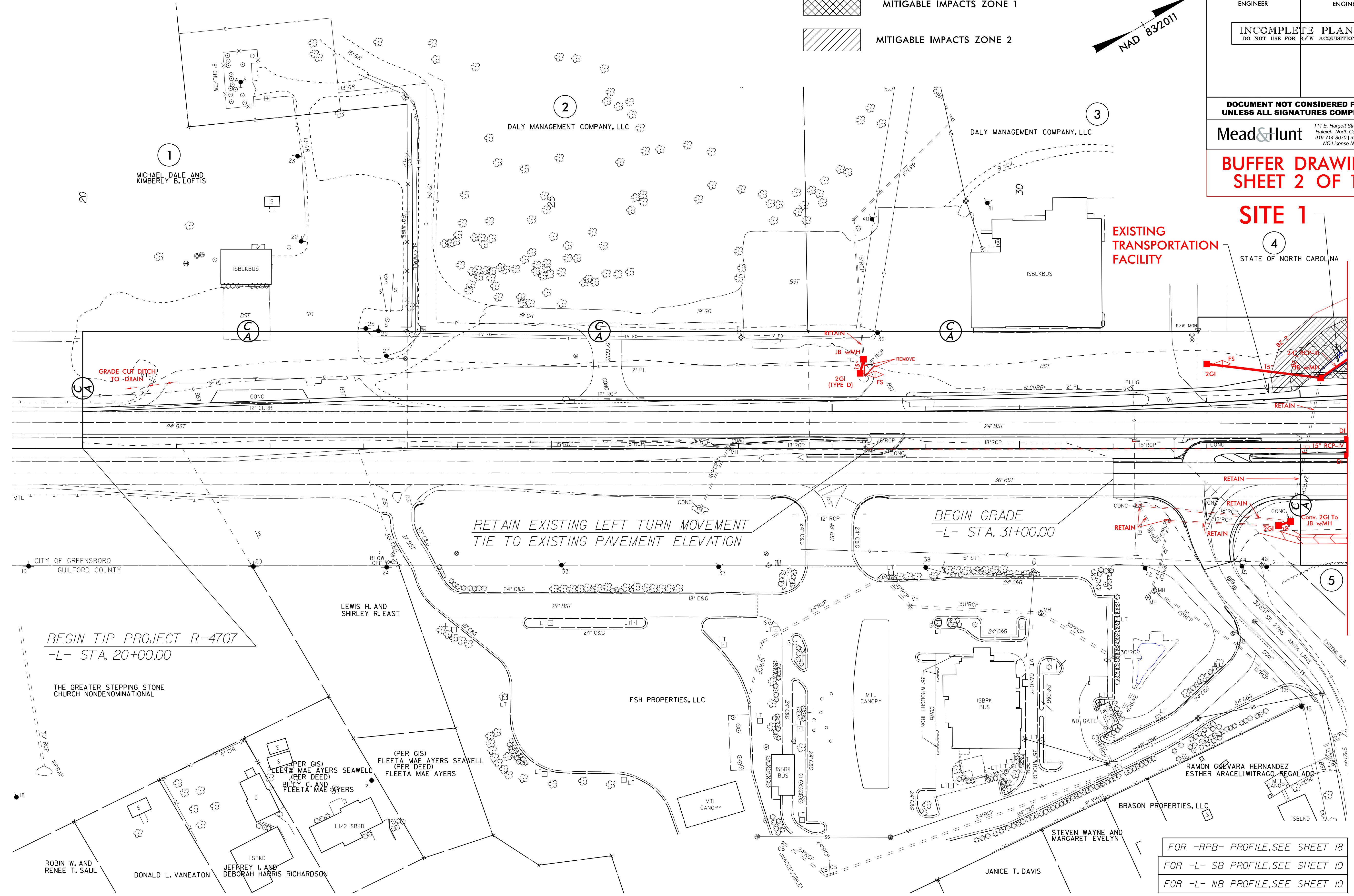
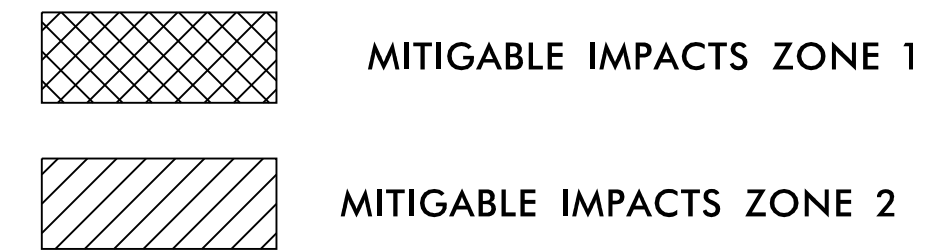






8/17/99

PROJECT REFERENCE NO. R-4707		SHEET NO. 4	
RW SHEET NO.		HYDRAULICS ENGINEER	
ROADWAY DESIGN ENGINEER		HYDRAULICS ENGINEER	
<b>INCOMPLETE PLANS</b> DO NOT USE FOR R/W ACQUISITION			
<b>DOCUMENT NOT CONSIDERED FINAL</b> UNLESS ALL SIGNATURES COMPLETED			
<b>Mead&amp;Hunt</b>		111 E. Hargett Street, Suite 300 Raleigh, North Carolina 27601 919-714-8870   meadandhunt.com NC License No. F-1235	
<b>BUFFER DRAWING</b> <b>SHEET 2 OF 10</b>			



REVISIONS

25-APR-2018 15:53  
 25-4-306200  
 2130mar

Environmental\Drawings\Buffer\_Impacts\R4707\_Hyd\_perm\_buf\_04.dgn

MATCHLINE -L- STA. 33+50.00 SEE SHEET 5

FOR -RPB- PROFILE, SEE SHEET 18  
 FOR -L- SB PROFILE, SEE SHEET 10  
 FOR -L- NB PROFILE, SEE SHEET 10

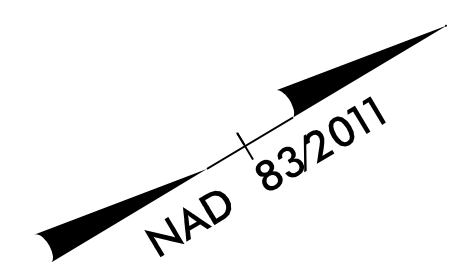






8/17/99

PROJECT REFERENCE NO. R-4707	SHEET NO. INSET: 4,5
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
<b>Mead&amp;Hunt</b> <small>111 E. Hargett Street, Suite 300 Raleigh, North Carolina 27601 919-714-8870   meadandhunt.com NC License No. F-1235</small>	
<b>BUFFER DRAWING SHEET 4 OF 10</b>	



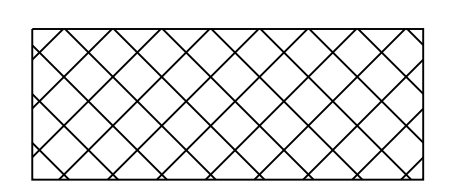
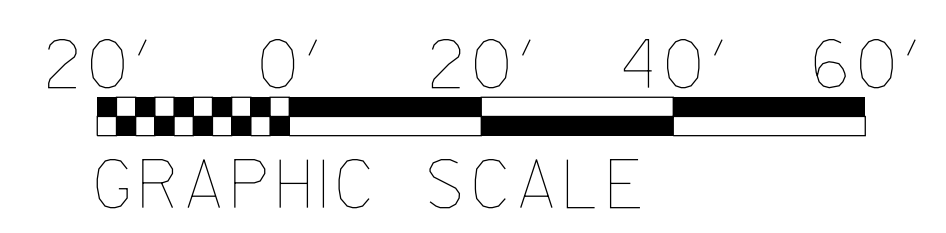
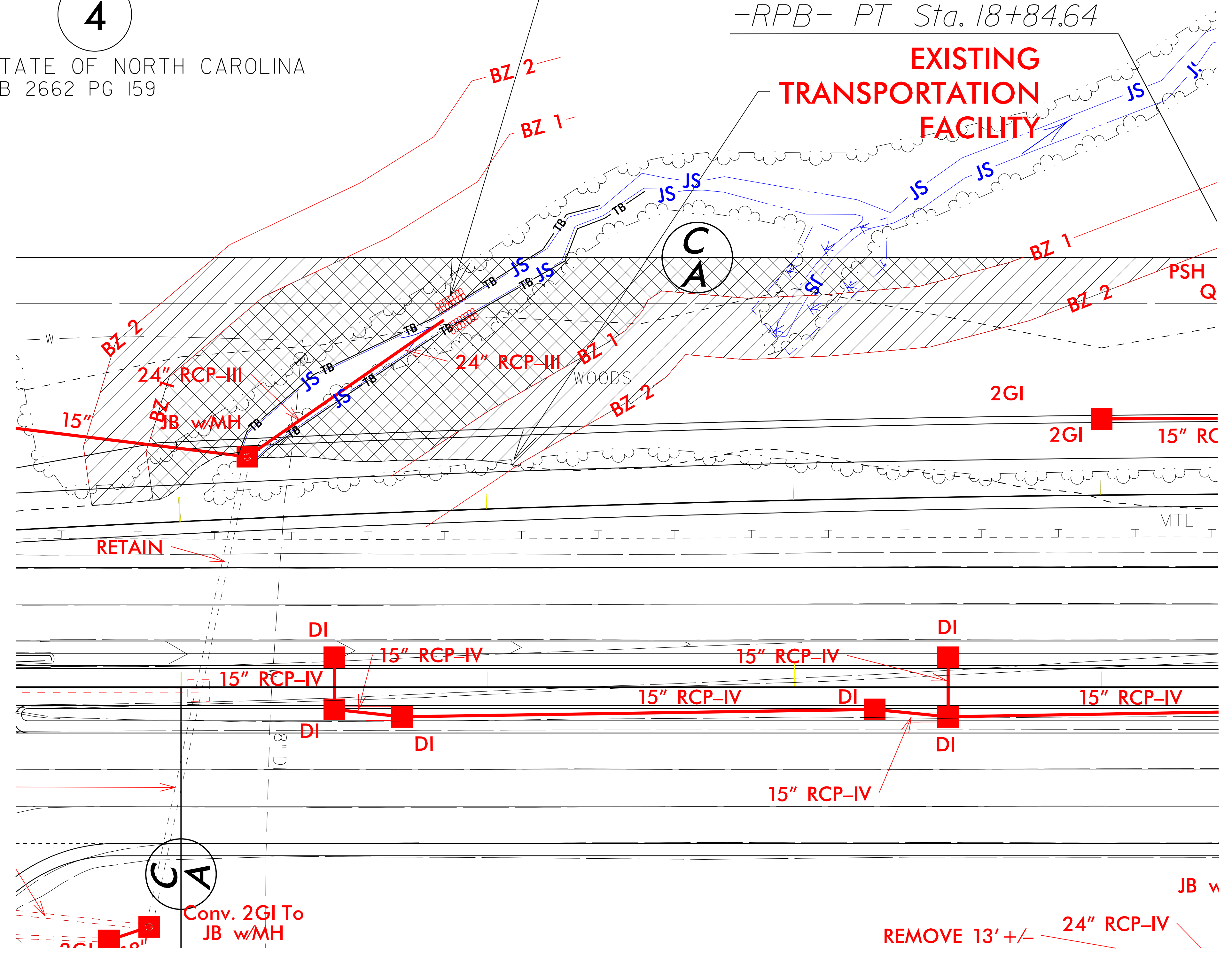
**4**

STATE OF NORTH CAROLINA  
DB 2662 PG 159

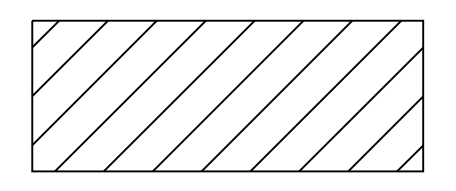
# SITE 1

-RPB- PT Sta. 18+84.64

## EXISTING TRANSPORTATION FACILITY



**MITIGABLE IMPACTS ZONE 1**



**MITIGABLE IMPACTS ZONE 2**

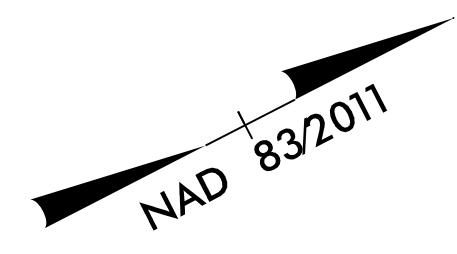
REVISIONS  
 25-APR-2019 16:53  
 X:\4506200\172319\_01\TECH\Hydraulics\PERMITS\_Environment\Drawings\Buffer\_Impacts\R4707\_Hyd\_prm\_buf\_inset\_01.dgn  
 2130msr



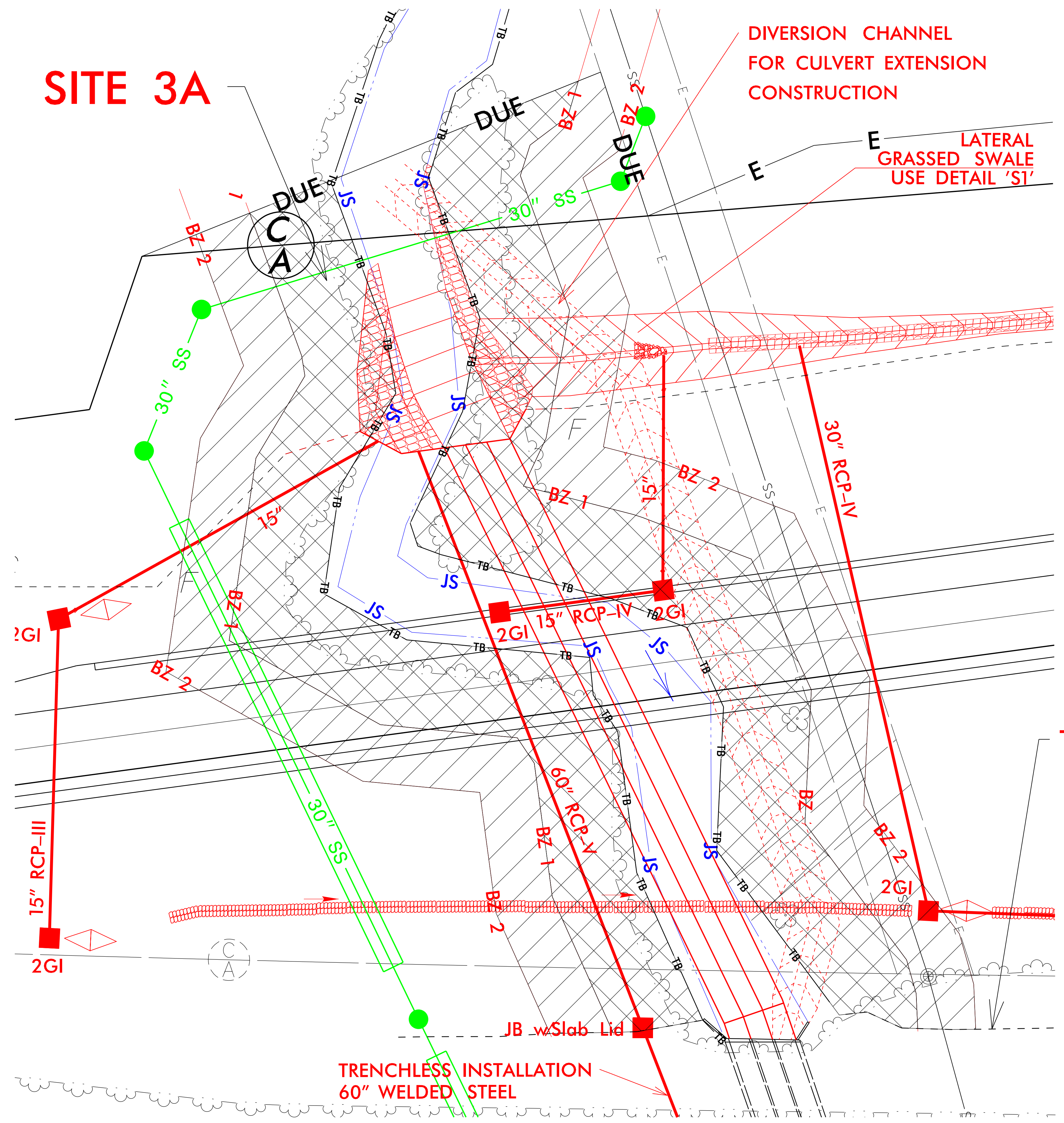




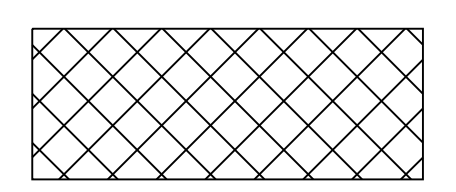
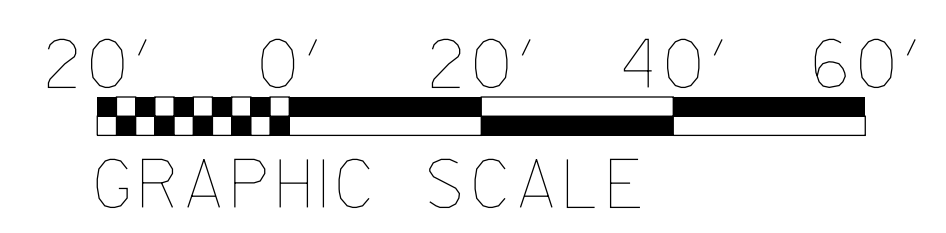
PROJECT REFERENCE NO. R-4707	SHEET NO. INSET:6A
RW SHEET NO.	
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
<b>Mead&amp;Hunt</b> <small>111 E. Hargett Street, Suite 300 Raleigh, North Carolina 27601 919-714-8870   meadhunt.com NC License No. F-1235</small>	
<b>BUFFER DRAWING SHEET 6 OF 10</b>	



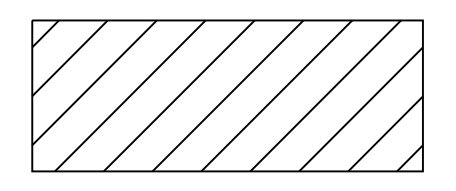
# SITE 3A



Q2 = 56.8 cfs  
 V2 = 2.7 fps  
 Q10 = 72.6 cfs  
 V10 = 2.9 fps

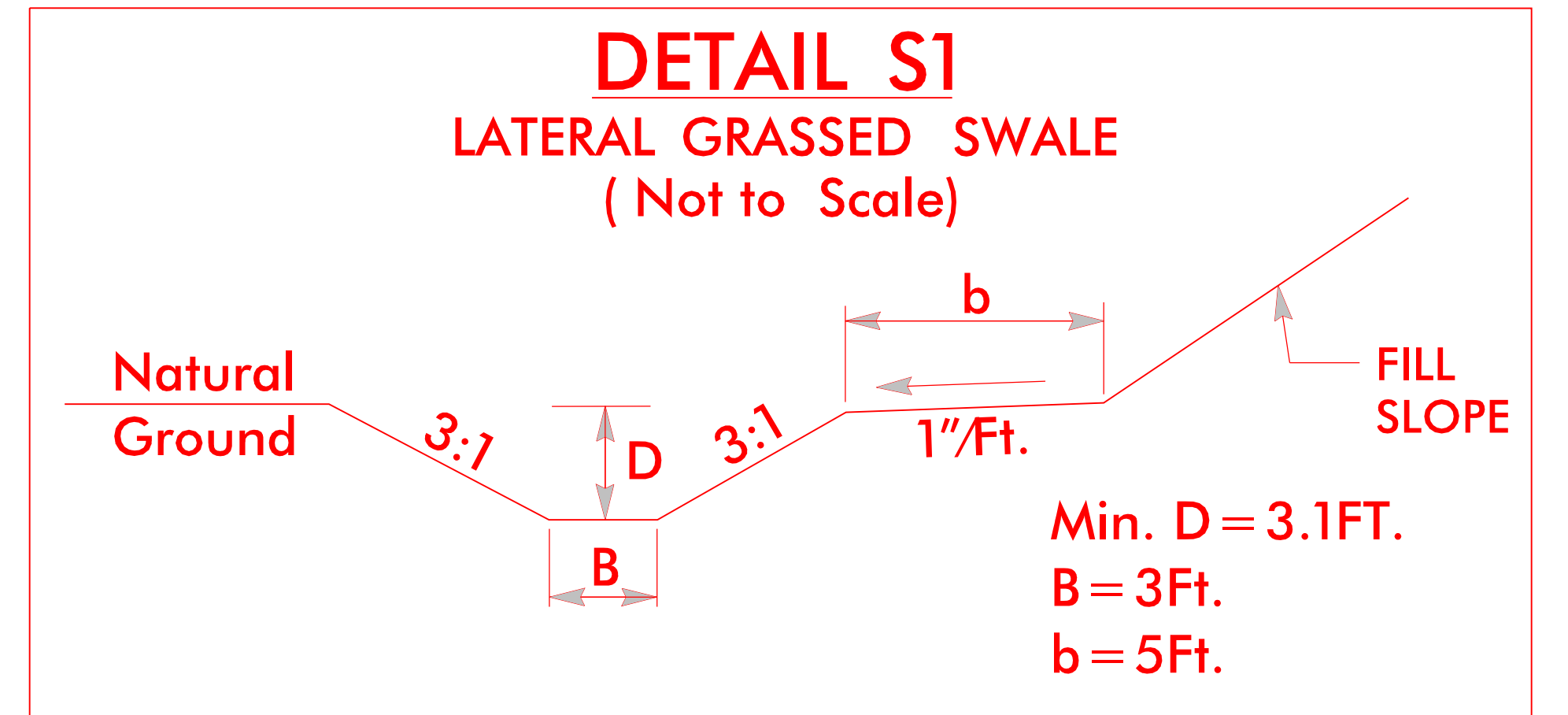


MITIGABLE IMPACTS ZONE 1



MITIGABLE IMPACTS ZONE 2

**EXISTING  
TRANSPORTATION  
FACILITY**

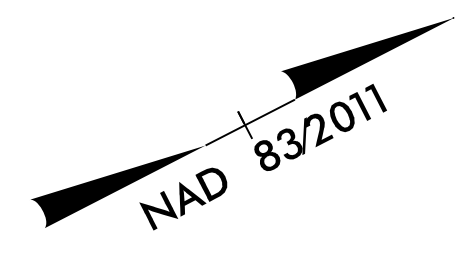


FROM -RPB- 37+13 STA. TO STA. 38+00

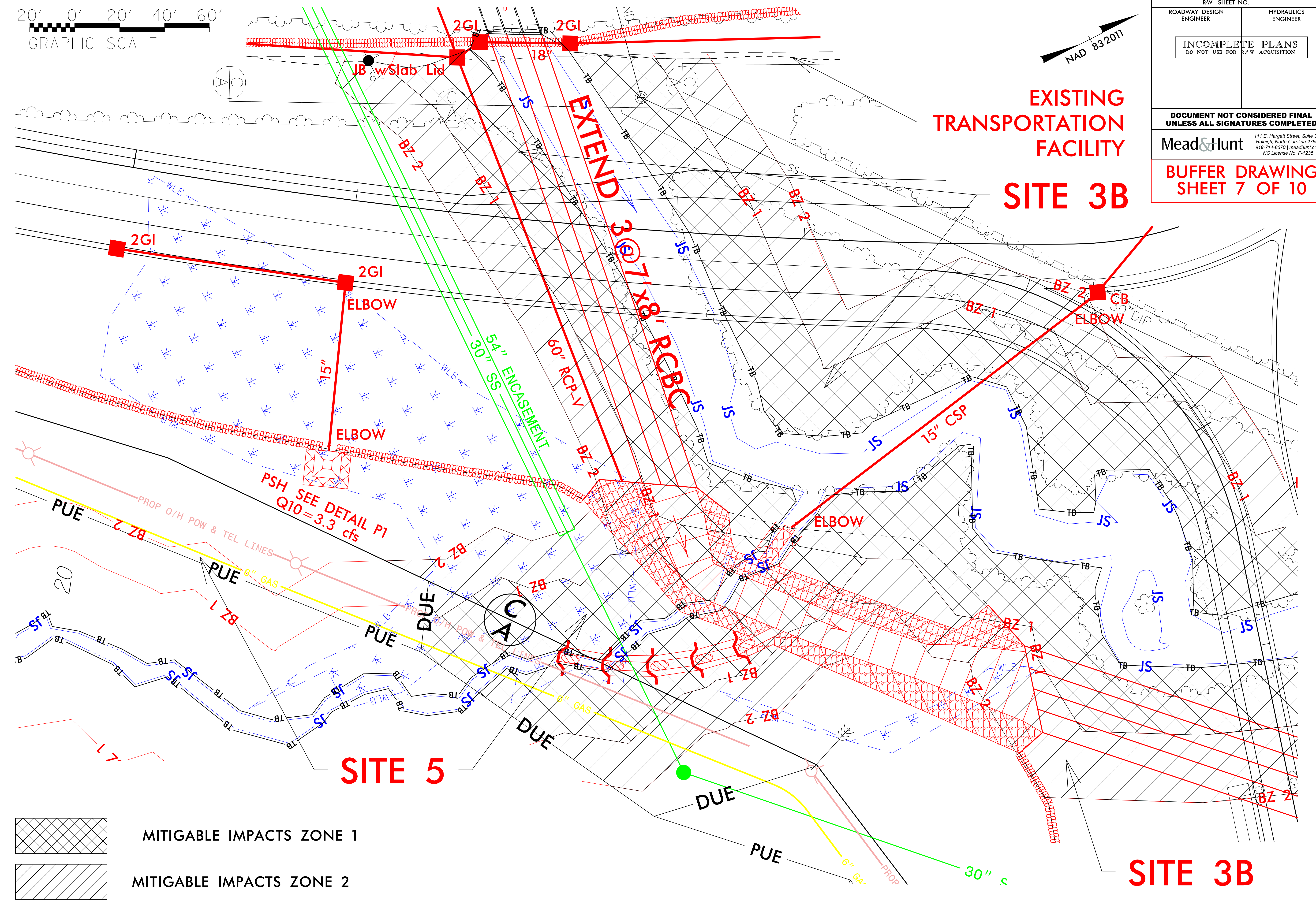
REVISIONS  
 25-APR-2019 16:53  
 X:\4506200\172319.0\1\TECH\Hydraulics\PERMITS\_Environment\Drawings\Buffer\_Impacts\R4707\_Hyd\_prm\_buf\_inset\_02.dgn  
 Z130msr



PROJECT REFERENCE NO. R-4707	SHEET NO. INSET: 6B
RW SHEET NO.	HYDRAULICS ENGINEER
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
<b>Mead&amp;Hunt</b> <small>111 E. Hargett Street, Suite 300 Raleigh, North Carolina 27601 919-714-8870   meadandhunt.com NC License No. F-1235</small>	
<b>BUFFER DRAWING SHEET 7 OF 10</b>	



**EXISTING  
TRANSPORTATION  
FACILITY  
SITE 3B**



- MITIGABLE IMPACTS ZONE 1
- MITIGABLE IMPACTS ZONE 2

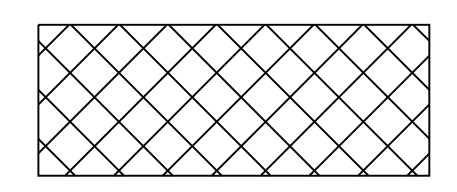
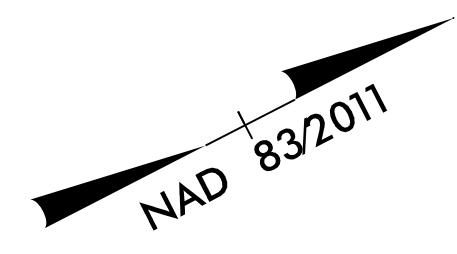
**SITE 3B**

**SITE 5**

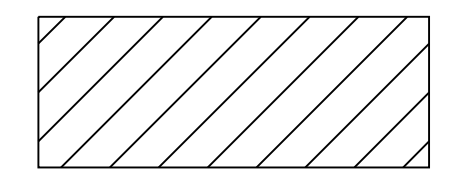
REVISIONS  
 25-APR-2019 16:53  
 X:\4306200\172319\_01\TECH\Hydraulics\PERMITS\_Environmental\Drawings\Buffer\_Impacts\R4707\_Hyd\_prm\_buf\_inset\_03.dgn  
 Z:\30msr



PROJECT REFERENCE NO. R-4707	SHEET NO. INSET: 6C
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER
INCOMPLETE PLANS DO NOT USE FOR R/W ACQUISITION	
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
<b>Mead&amp;Hunt</b> <small>111 E. Hargett Street, Suite 300 Raleigh, North Carolina 27601 919-714-8870   meadandhunt.com NC License No. F-1235</small>	
<b>BUFFER DRAWING SHEET 8 OF 10</b>	



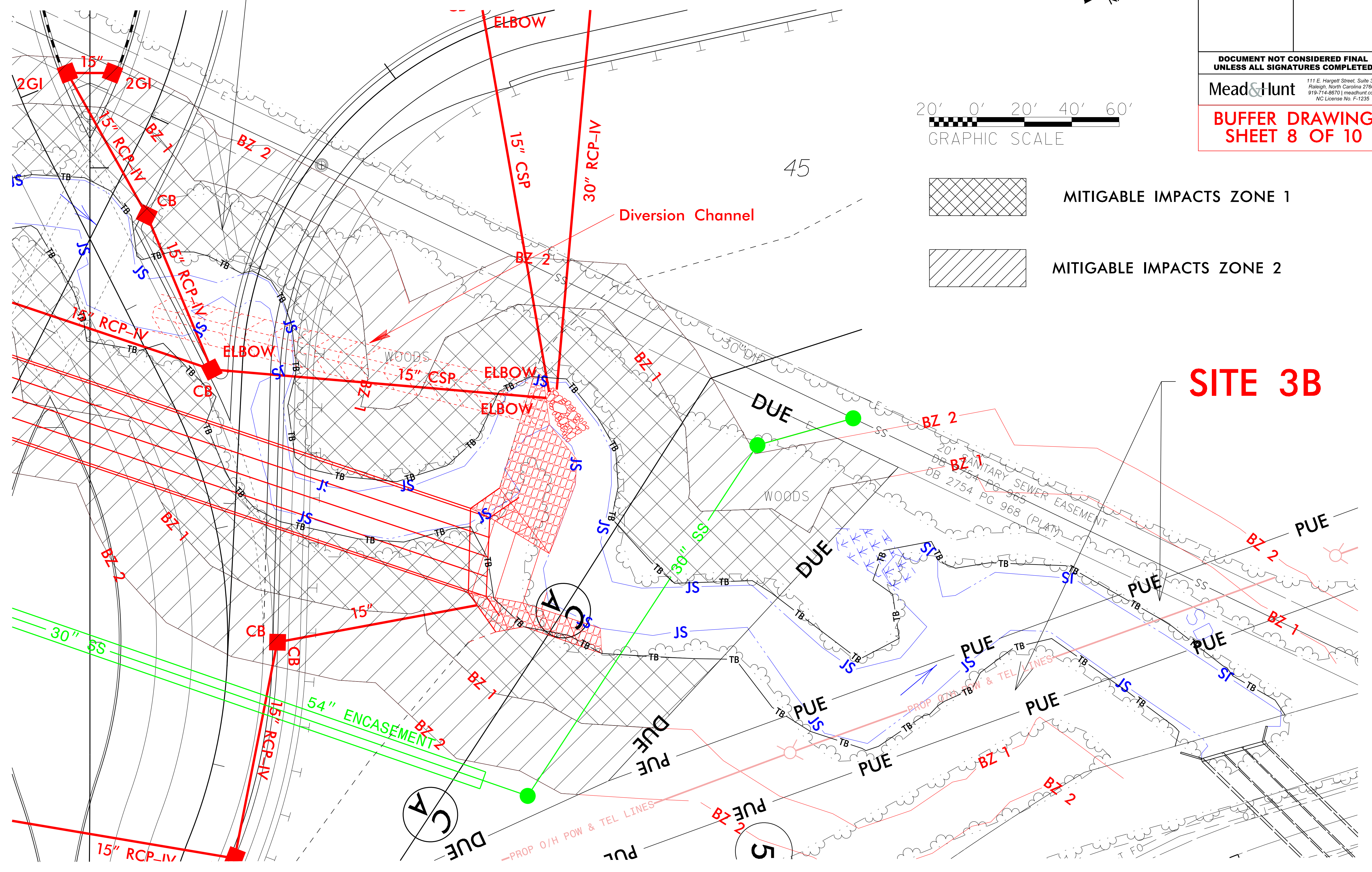
MITIGABLE IMPACTS ZONE 1



MITIGABLE IMPACTS ZONE 2

# SITE 3B

# SITE 3B



REVISIONS  
 25-APR-2019 16:53  
 X:\4506200\172319\_01\TECH\Hydraulics\PERMITS\_Environmental\Drawings\Buffer\_Impacts\R4707\_Hyd\_prm\_buf\_inset\_04.dgn  
 2130msr

8/17/99







