

TIP PROJECT: F-660028

WBS: 41732.6

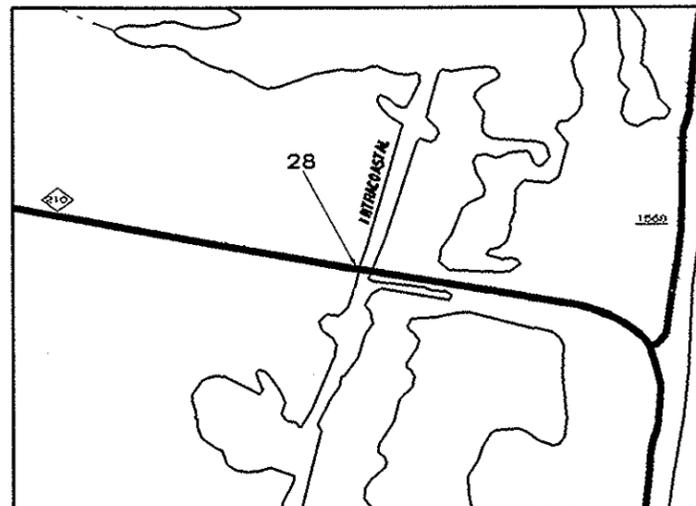
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**ONSLOW COUNTY**

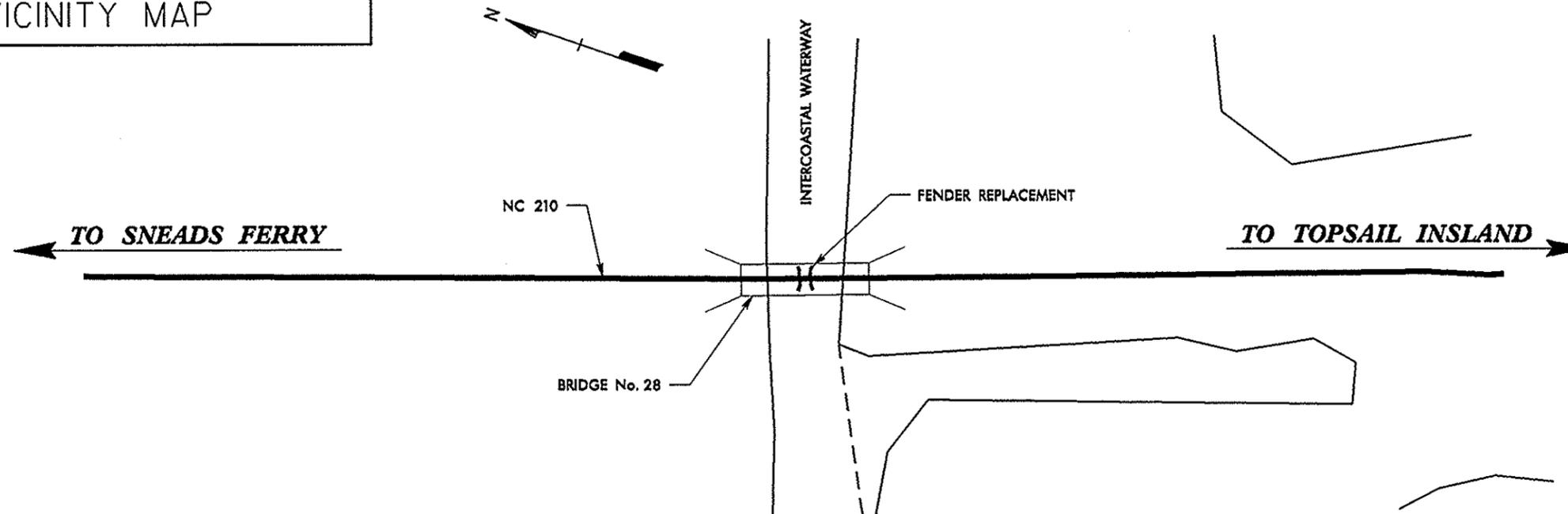
LOCATION: BRIDGE NO. 28 ON NC 210 OVER THE INTERCOASTAL WATERWAY

TYPE OF WORK: REPLACEMENT OF EXISTING FENDER SYSTEM

STATE	STATE PROJECT REFERENCE NO.		
N.C.	F-660028		
WBS PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION	



VICINITY MAP



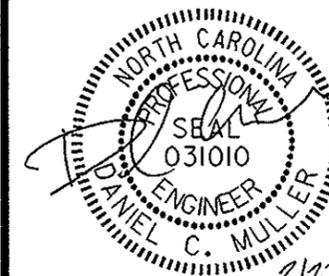
2012 STANDARDS SPECIFICATION

LETTING DATE:  
APRIL 5, 2012

Prepared In the Office of:  
**DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS**  
4809 Beryl Road Raleigh, N.C. 27606

**RICK NELSON, P.E.**  
PROJECT ENGINEER

**DANIEL C. MULLER, P.E.**  
PROJECT DESIGN ENGINEER



**GENERAL NOTES:**

FOR U.S. COAST GUARD NOTIFICATION, SEE SPECIAL PROVISION FOR "COORDINATION WITH THE U.S. COAST GUARD".

FOR NAVIGATIONAL LIGHTS, SEE SPECIAL PROVISION FOR "COORDINATION WITH THE U.S. COAST GUARD".

FOR SECURING OF VESSELS, SEE SPECIAL PROVISIONS.

FOR REMOVAL OF EXISTING FENDER SYSTEMS, SEE SPECIAL PROVISIONS.

FOR PILE DRIVING EQUIPMENT DATA SUBMITTAL, SEE SPECIAL PROVISION FOR "SUBMITTAL OF WORKING DRAWINGS".

ALL THE BOLTS, WASHER, NUTS, AND ALL OTHER HARDWARE SHALL BE GALVANIZED AND SHALL BE GRADE A-307.

GALVANIZING SHALL BE DONE IN ACCORDANCE WITH SECTION 1076 OF NCDOT STANDARD SPECIFICATIONS FOR ROAD AND STRUCTURES DATED JULY 2012.

ALL O.G. WASHERS SHALL CONFORM TO ASTM A47 CLASS 30.

ALL TREATED LUMBER SHALL CONFORM TO SECTION 1082 OF THE STANDARD SPECIFICATIONS OR AS NOTED ON THE PLANS.

FOR WIRE ROPE FOR FENDER SYSTEM, SEE SPECIAL PROVISION.

THE CONTRACTOR SHALL RELOCATE THE CLEARANCE MARKER AT BOTH ENDS OF THE FENDER SYSTEM TO THE LOCATION DESIGNATED BY THE ENGINEER.

THE CONTRACTOR SHALL VISIT THE JOB SITE AND CHECK THE MATERIALS AND THE QUANTITY NEEDED TO COMPLETE ALL THE WORK IN ACCORDANCE WITH THE PLANS, PROJECT SPECIAL PROVISIONS, AND THE NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES DATED JULY 2012.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR FULFILLING ALL THE REQUIREMENTS OF THE NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES DATED JULY 2012, EXCEPT AS OTHERWISE NOTED ON THE PLANS AND SPECIAL PROVISIONS.

PROPOSED TIMBER PILING IS LOCATED TO MINIMIZE LOCATIONS WHERE EXISTING AND PROPOSED PILING COINCIDE. HOWEVER, NOTE THAT SOME OR ALL OF THE EXISTING PILING MAY BE REQUIRED TO BE FULLY REMOVED IF THE EXISTING PILING BREAKS UPON INITIAL EXTRACTION.

THE PROPOSED FENDER FACE OF NEW FENDER SYSTEM SHALL MATCH THE EXISTING FENDER FACE OF THE EXISTING FENDER SYSTEM. DIMENSIONS SHOWN ON THE PLANS ARE FROM PRELIMINARY FIELD MEASUREMENTS AND SHALL BE FIELD VERIFIED PRIOR TO FABRICATING AND/OR OBTAINING MATERIALS.

ALL DOME HEAD TIMBER BOLTS SHALL BE FASTENED BY THE "TURN-OF-NUT TIGHTING" METHOD AS DESCRIBED IN SECTION 440 OF THE STANDARD SPECIFICATIONS.

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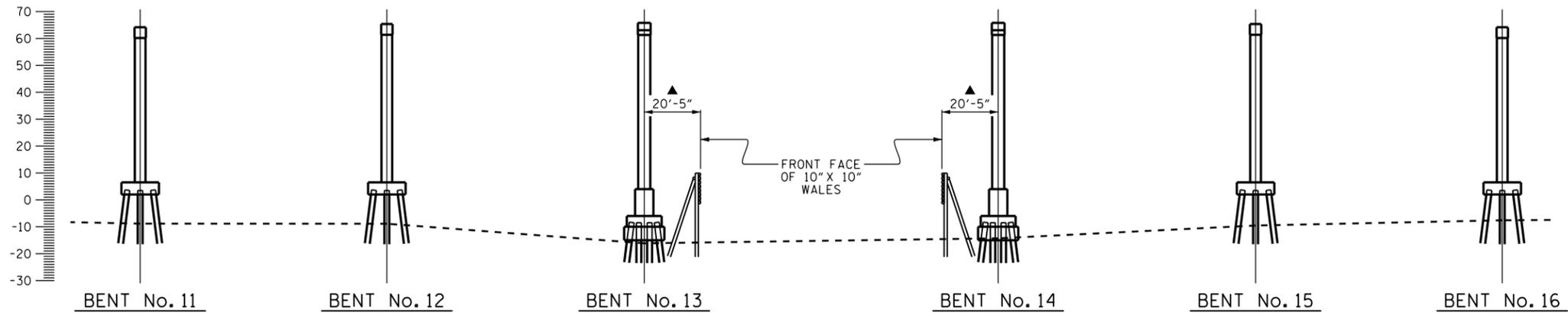
COUNTY ONSLow

BRIDGE NO. 28

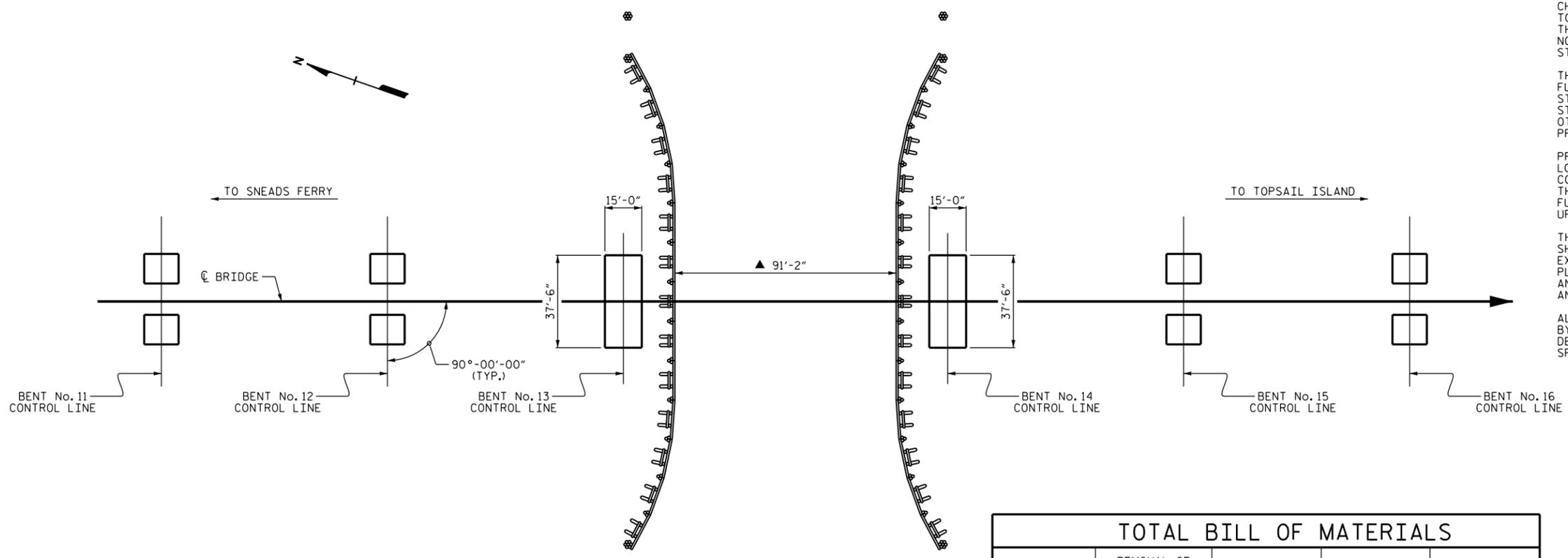
STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH

**FENDER SYSTEM  
FENDER LAYOUT PLAN**

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	F-1
1			3			TOTAL SHEETS
2			4			5



**ELEVATION**  
TAKEN ALONG C OF BRIDGE



**PLAN VIEW**

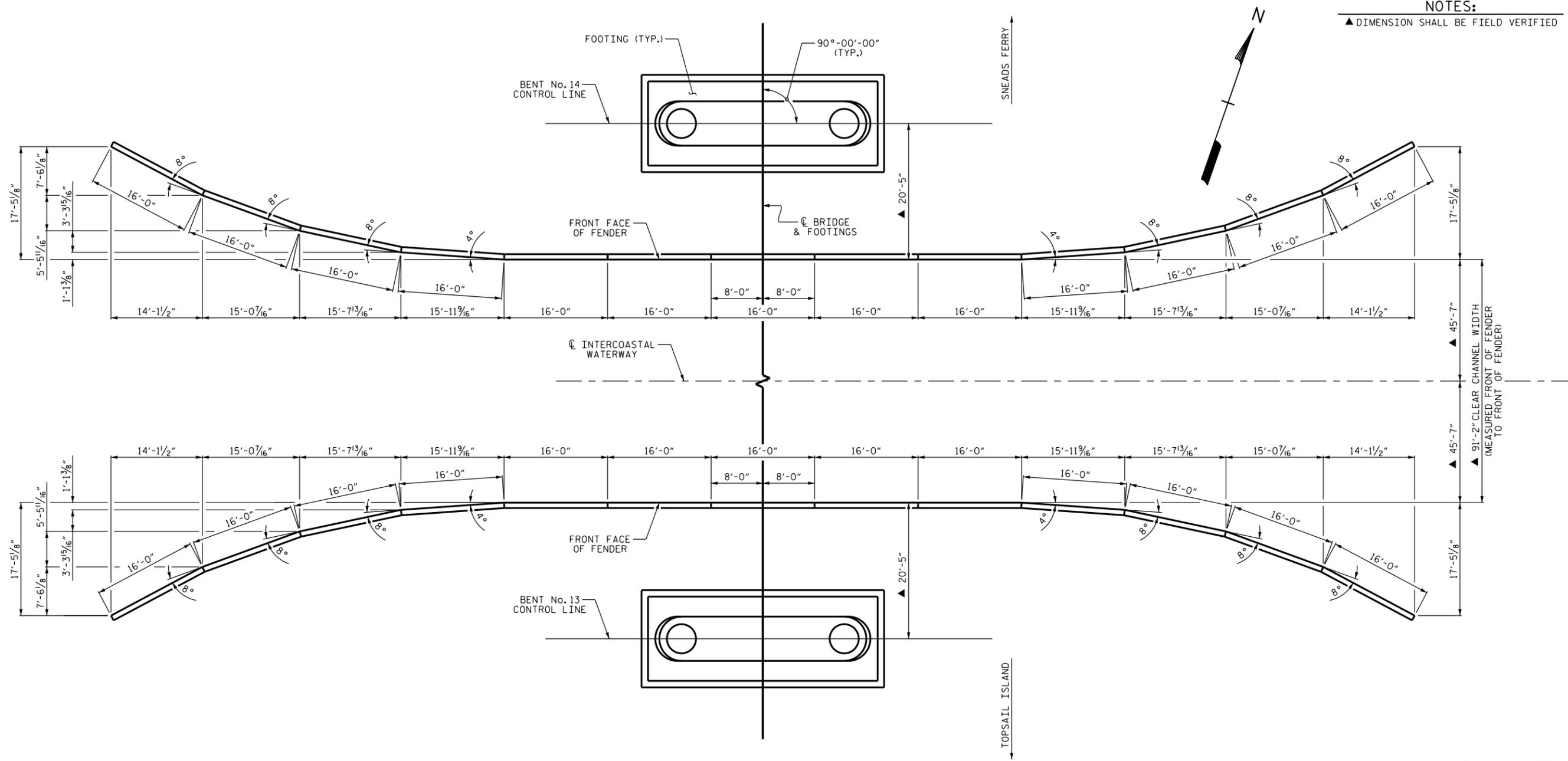
▲ DIMENSION SHALL BE FIELD VERIFIED

TOTAL BILL OF MATERIALS				
	REMOVAL OF EXISTING FENDER SYSTEM	10"x10" TREATED LUMBER	12" TREATED TIMBER PILE	HARDWARE
LUMP SUM	LUMP SUM	3085 LIN. FT.	11600 LIN. FT.	7270 LBS

DRAWN BY : T. BANKOVICH DATE : 7-2011  
CHECKED BY : T. BEACH DATE : 8-2011

NOTES:

▲ DIMENSION SHALL BE FIELD VERIFIED



FENDER LAYOUT

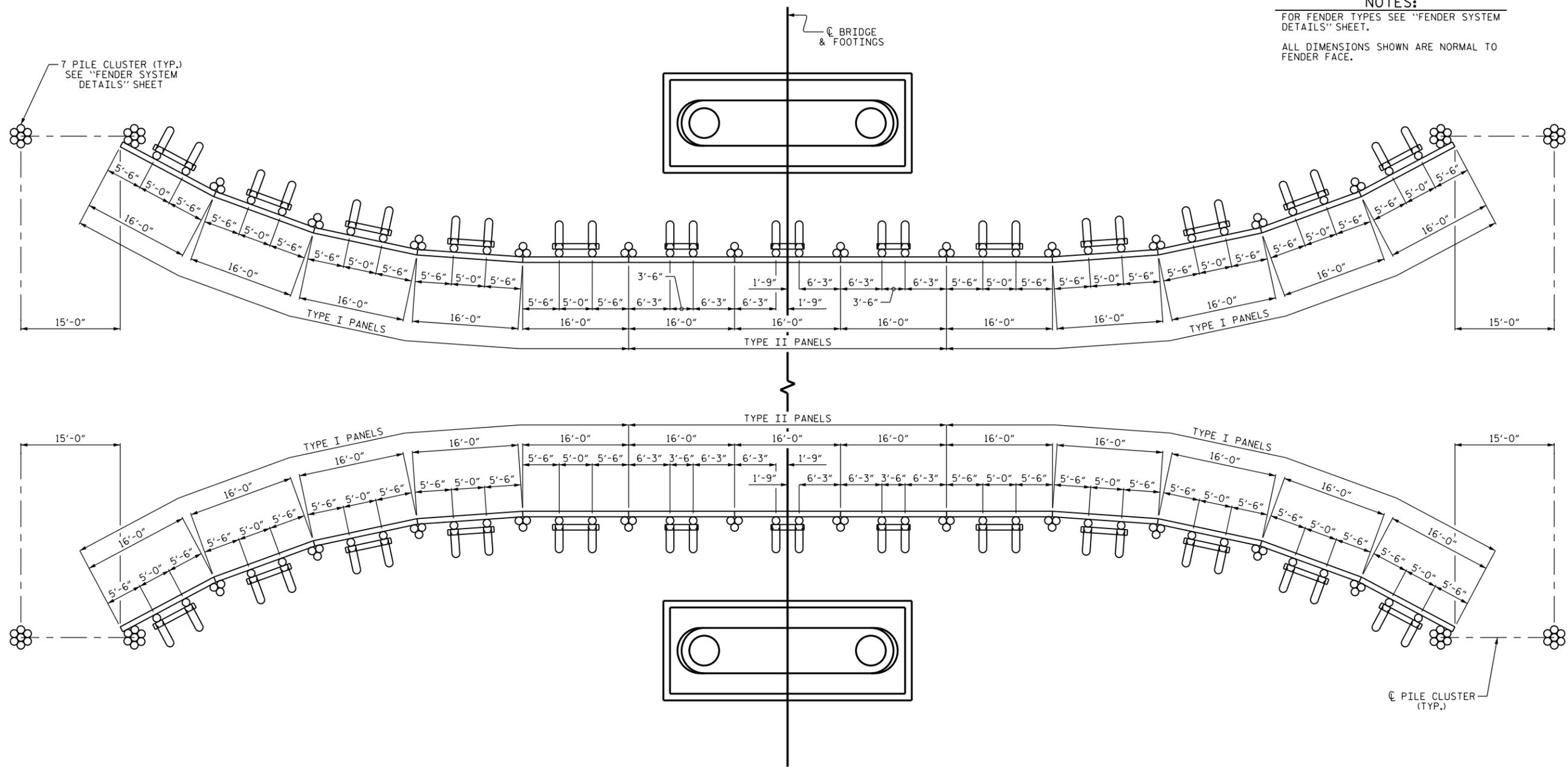
PROJECT NO. F-660028  
 COUNTY ONSLow  
 BRIDGE NO. 28

STATE OF NORTH CAROLINA						SHEET NO. F-2
DEPARTMENT OF TRANSPORTATION						
RALEIGH						TOTAL SHEETS 5
FENDER SYSTEM						
FENDER LAYOUT						
REVISIONS						
NO.	BY:	DATE:	NO.	BY:	DATE:	
1			3			
2			4			

DRAWN BY : T. BANKOVICH DATE : 7-2011  
 CHECKED BY : T. BEACH DATE : 8-2011

05-DEC-2011 12:25  
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 dmuller

**NOTES:**  
 FOR FENDER TYPES SEE "FENDER SYSTEM DETAILS" SHEET.  
 ALL DIMENSIONS SHOWN ARE NORMAL TO FENDER FACE.



PILE LAYOUT

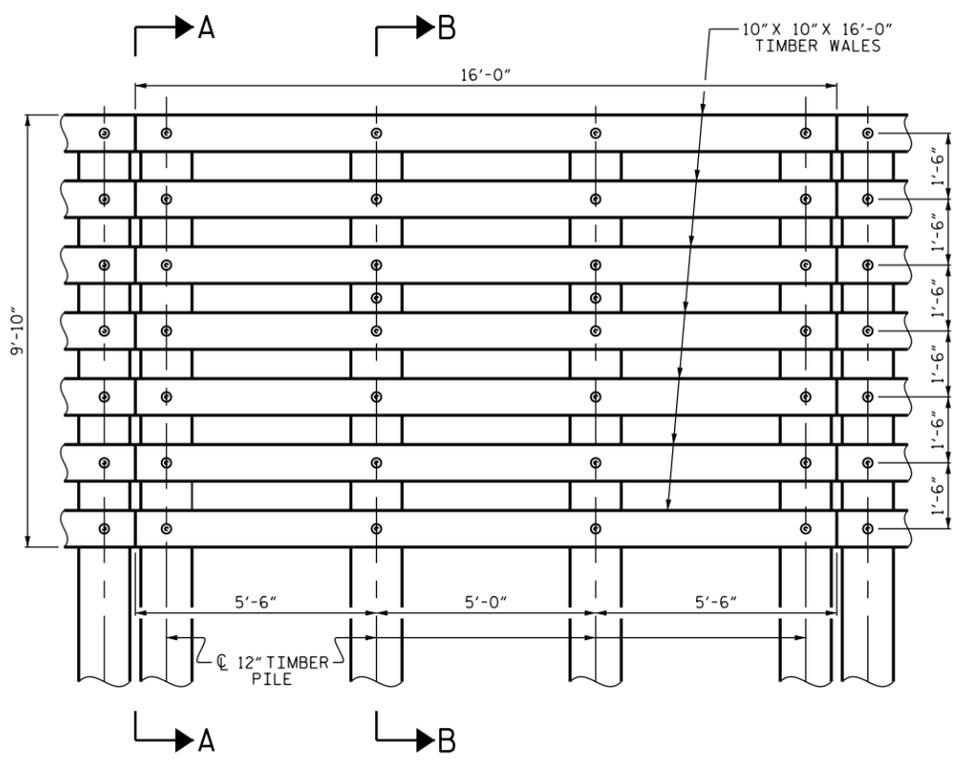
PROJECT NO. F-660028  
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STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 RALEIGH  
 FENDER SYSTEM  
 PILE LAYOUT

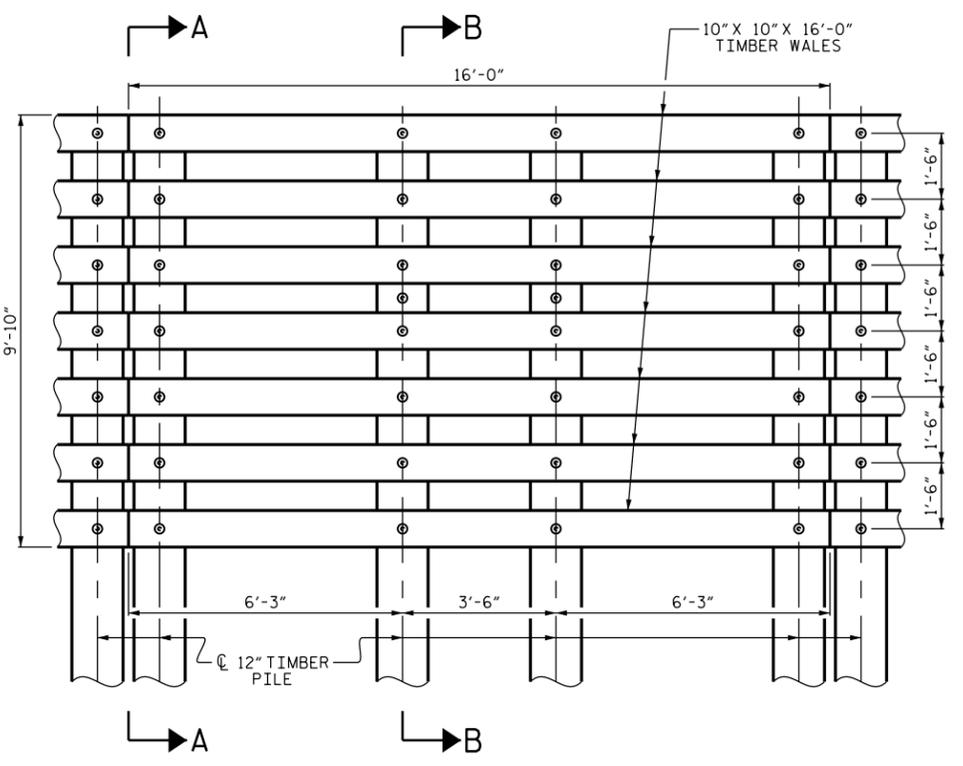
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	F-3
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2			4			5

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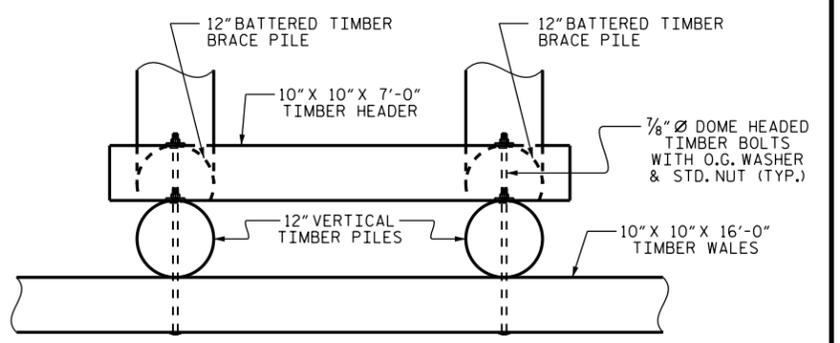
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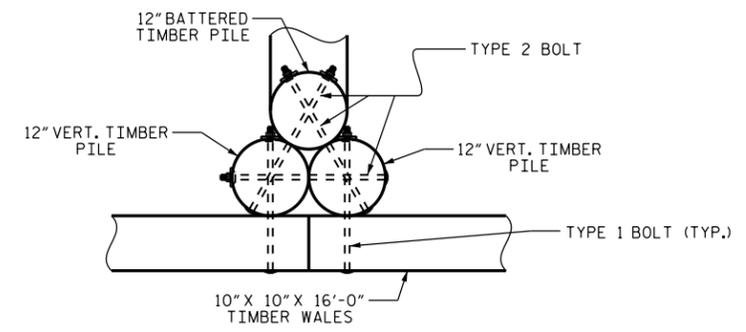
TYPE I PANELS



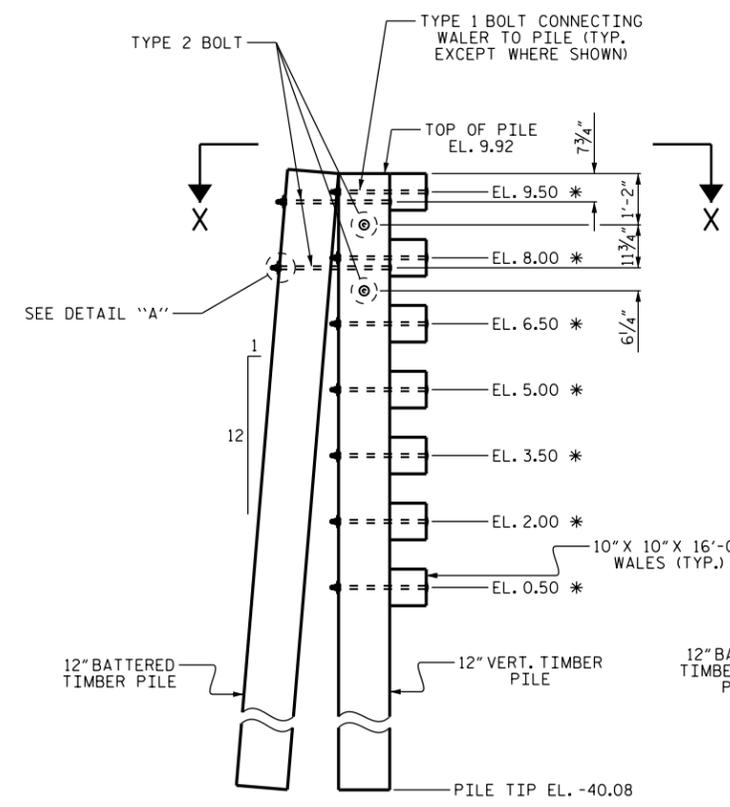
TYPE II PANELS



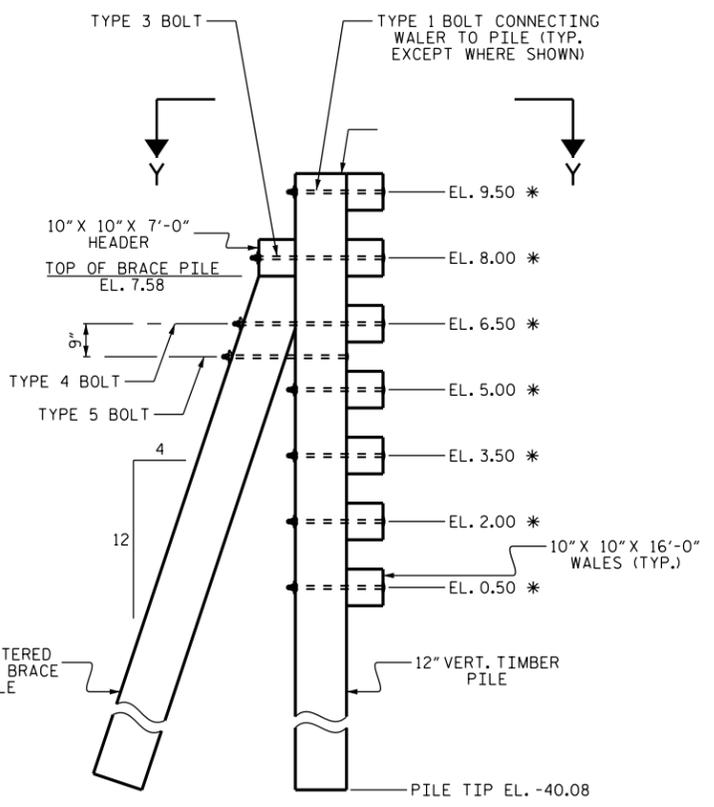
VIEW Y-Y



VIEW X-X



SECTION A-A

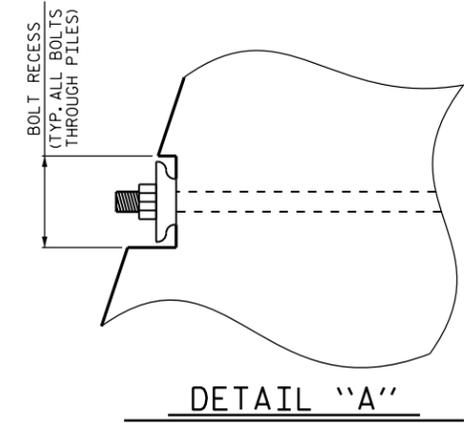


SECTION B-B

\* ELEVATIONS SHOWN ARE TO THE CENTER OF WALE

BOLT TYPE TABLE	
BOLT TYPE	LENGTH
1	25"
2	27"
3	35"
4	40"
5	33"

ALL BOLT TYPES ARE 7/8" Ø DOME HEADED TIMBER BOLTS WITH O.G. WASHER & STD. NUT



DETAIL "A"

NOTES:

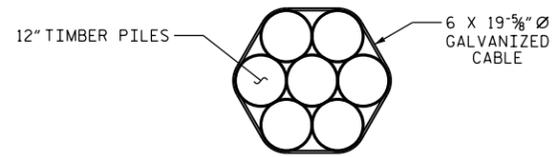
ALL DOME HEADS SHALL BE LOCATED AT THE FRONT FACE OF THE FENDER SYSTEM.  
ON THE BACK SIDE OF FENDER SYSTEM THE BOLTS GOING THROUGH VERTICAL AND BATTERED PILES SHALL BE RECESSED TO ALLOW THE WASHER/NUT TO LIE FLUSH AGAINST THE PILE.

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STATE OF NORTH CAROLINA  
DEPARTMENT OF TRANSPORTATION  
RALEIGH  
FENDER SYSTEM  
FENDER SYSTEM  
DETAILS

REVISIONS						SHEET NO.	
NO.	BY:	DATE:	NO.	BY:	DATE:	F-4	
1			3			TOTAL SHEETS	5
2			4				

DRAWN BY : T. BANKOVICH DATE : 7-2011  
CHECKED BY : T. BEACH DATE : 8-2011



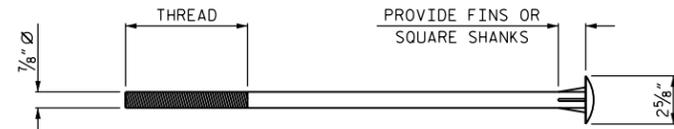
### DETAIL OF 7-PILE CLUSTER (DOLPHINS)

#### PILES AT ENDS OF FENDER SYSTEM

SIX (6) OUTSIDE PILES TO BE EQUALLY SPACED ON A 6 FT. CIRCLE AND DRAWN TOGETHER AT TOP, WRAPPED WITH 3 TURNS OF 6 X 19-5/8" Ø GALVANIZED CABLE AT ELEVATIONS +4.25 AND +8.75. CABLE SHALL BE SECURED WITH 3/8" Ø X 4" GALVANIZED STAPLES AND THREE WIRE CLIPS AT EACH END. ALL PILES SHALL BE VERTICAL.

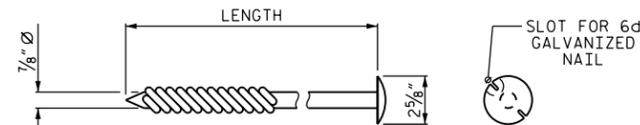
#### PILES 15' FROM ENDS OF FENDER SYSTEM

SIX (6) OUTSIDE PILES TO BE EQUALLY SPACED ON A 6 FT. CIRCLE AT TOP AND BATTERED AT 1/2:12. DRAW THE PILES TOGETHER AT THE TOP AND WRAP WITH 3 TURNS OF 6 X 19-5/8" Ø GALVANIZED CABLE AT ELEVATION +4.25 AND +8.75. CABLE SHALL BE SECURED WITH 3/8" Ø X 4" GALVANIZED STAPLES AND THREE WIRE ROPE CLIPS AT EACH END.



#### TYPICAL DOME HEAD TIMBER BOLT

ALL BOLT HEADS MUST BE IN FULL CONTACT WITH THE SURFACE OF THE TIMBER PILES OR WALES.



#### TYPICAL DOME HEAD DRIVE SPIKE

ALL DRIVE SPIKE HEADS MUST BE IN FULL CONTACT WITH THE SURFACE OF THE TIMBER PILES OR WALES.

STRUCTURAL TIMBER					
ITEM	UNIT	LENGTH	SIZE	NO.	TOTAL
12" TIMBER PILE	LIN. FT.	50'-0"	12"	180	9000'-0"
12" BRACE PILE	LIN. FT.	50'-0"	12"	52	600'-0"
TIMBER WALE	LIN. FT.	16'-0"	10" X 10"	182	2,912'-0"
TIMBER HEADER	LIN. FT.	7'-0"	10" X 10"	20	140'-0"
TIMBER HEADER	LIN. FT.	5'-6"	10" X 10"	6	33'-0"

STRUCTURAL HARDWARE (GALVANIZED)			
ITEM	UNIT	NO.	TOTAL
6 X 19-5/8" Ø WIRE ROPE	LIN. FT.	—	730'-0"
3/8" X 4" STAPLES	LBS.	290	64 LBS.
5/8" WIRE ROPE CLIPS	LBS.	150	150 LBS.
1/8" Ø DOME HEAD DRIVE SPIKE	LBS.	60	173 LBS.
6d COMMON NAIL	BOX	1	1 LBS.
1/8" Ø X 25" DOME HEAD TIMBER BOLT	LBS.	650	3,315 LBS.
1/8" Ø X 27" DOME HEAD TIMBER BOLT	LBS.	150	820 LBS.
1/8" Ø X 35" DOME HEAD TIMBER BOLT	LBS.	60	414 LBS.
1/8" Ø X 40" DOME HEAD TIMBER BOLT	LBS.	60	469 LBS.
1/8" Ø X 33" DOME HEAD TIMBER BOLT	LBS.	60	358 LBS.
O.G. WASHER	LBS./100	980	1,215 LBS.
1/8" HEAVY HEX NUT	LBS./100	980	291 LBS.

PROJECT NO. F-660028  
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STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH					
FENDER SYSTEM					
FENDER SYSTEM DETAILS					
REVISIONS					SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:
1			3		
2			4		
TOTAL SHEETS					5

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