WBS: 15B.13.34

CONTRACT:

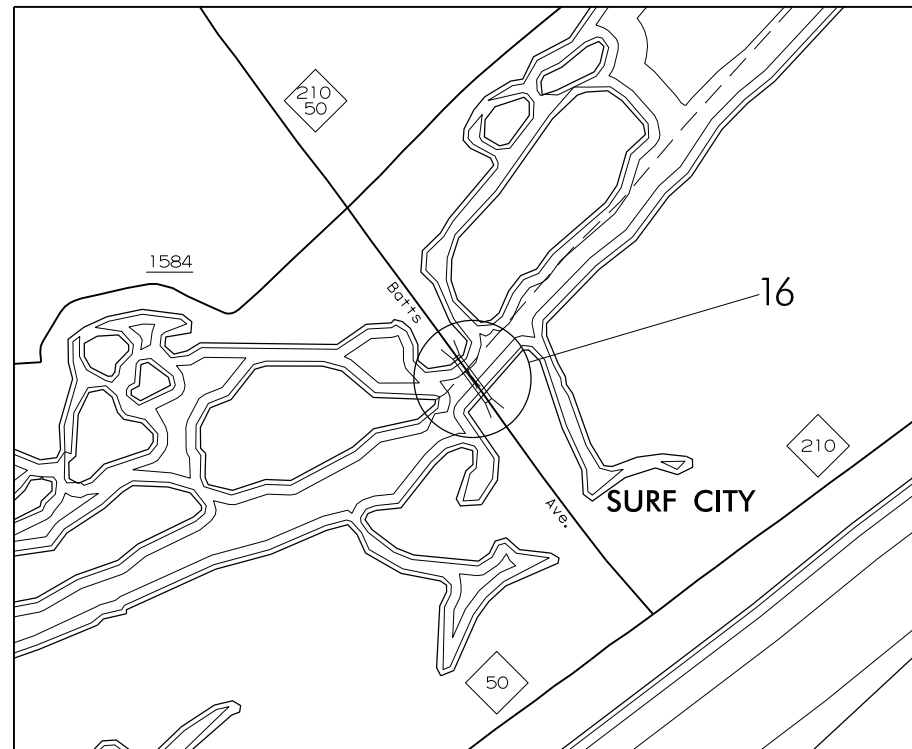# STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PENDER COUNTY
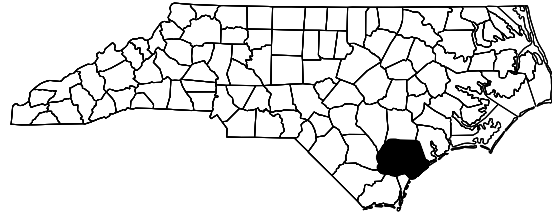
STATE	STATE PROJECT REFERENCE NO.	SHEET NO.	TOTAL SHEETS
N.C.	–	1	
STATE PROJ. NO.	**F. A. PROJ. NO.**	**DESCRIPTION**	
15B.13.34	–	P.E.	
15B.13.34	–	CONST.	

LOCATION: *PENDER COUNTY:*
BRIDGE #16 ON NC50/NC210 OVER THE INTRACOASTAL WATERWAY

TYPE OF WORK: *REPLACEMENT OF EXISTING FENDER SYSTEM*

VICINITY MAP – PENDER CO.
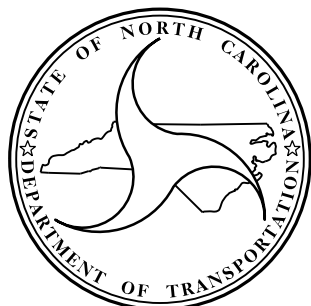
DESIGN DATA
PENDER COUNTY
#16 ADT 2012   =   11,000

PROJECT LENGTH
PENDER COUNTY
#30   =   0.09 MILES

Prepared In the Office of:
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
STRUCTURES MANAGEMENT UNIT – PRESERVATION & REPAIR GROUP
1000 BIRCH RIDGE DR. RALEIGH, N.C. 27610

TIMOTHY M. SHERRILL, P.E.
PROJECT ENGINEER

2012 STANDARD SPECIFICATIONS

LETTING DATE:
AUGUST 4, 2015

DocuSigned by:
William A. Clarke
1EB...

NORTH CAROLINA
PROFESSIONAL
SEAL
40257
ENGINEER
W. MATTHEW CLARKE

7/24/2015

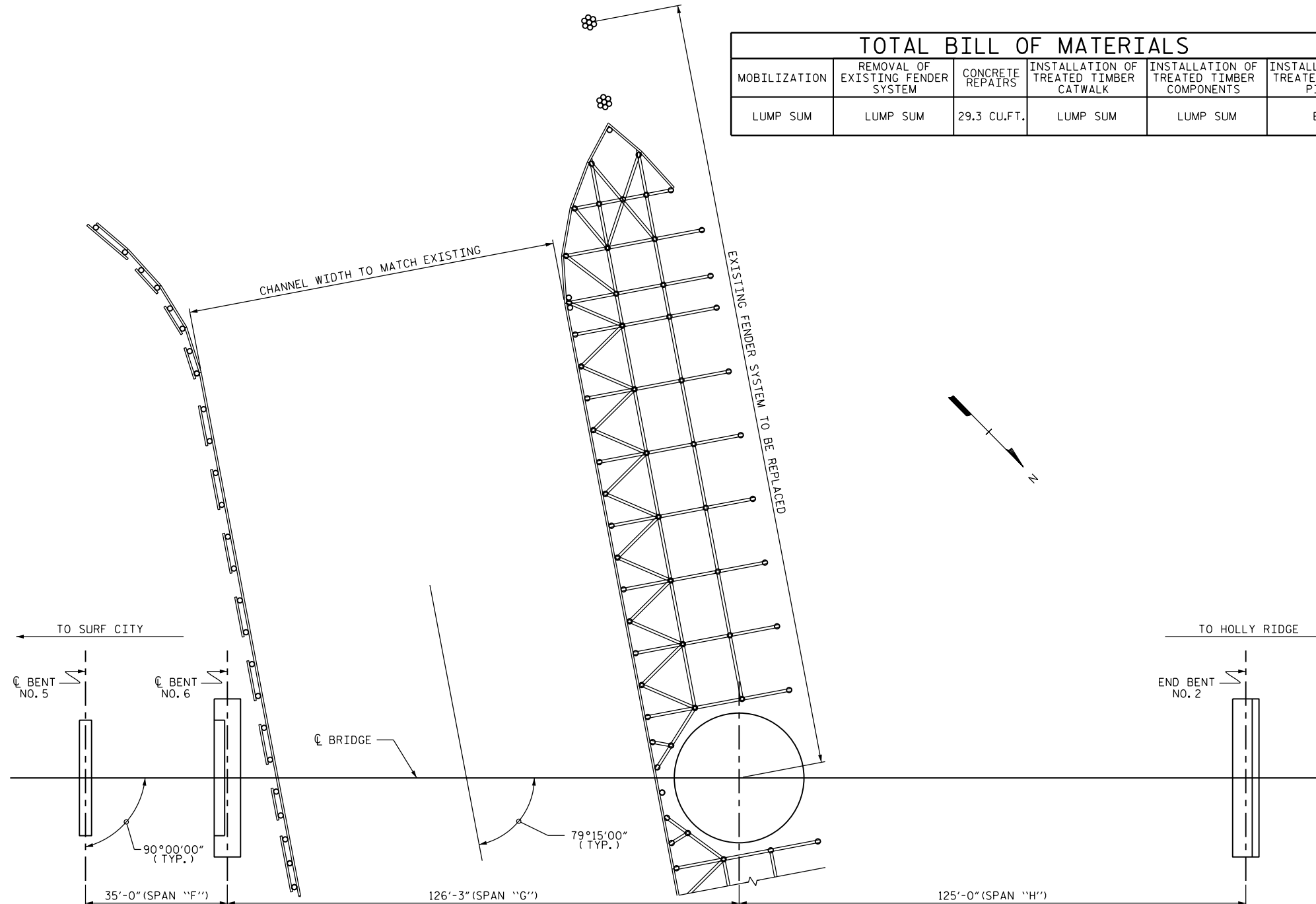**W. MATTHEW   CLARKE, P.E.**
PROJECT DESIGN ENGINEER

GENERAL NOTES:

FOR COORDINATION WITH THE U.S. COAST GUARD, SEE SPECIAL PROVISIONS.

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

FOR SECURING OF VESSELS, SEE SPECIAL PROVISIONS.

FOR MAINTENANCE OF WATER TRAFFIC, SEE SPECIAL PROVISIONS.

FOR CONCRETE REPAIRS, SEE SPECIAL PROVISIONS.

FOR REMOVAL OF EXISTING FENDER SYSTEM, SEE SPECIAL PROVISIONS.

FOR PILE DRIVING EQUIPMENT DATA SUBMITTAL, SEE SPECIAL PROVISIONS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR WORK IN, OVER OR ADJACENT TO NAVIGABLE WATERS, SEE SPECIAL PROVISIONS.

FOR WIRE ROPE FOR FENDER SYSTEM, SEE SPECIAL PROVISIONS.

FOR FENDER REPLACEMENT, SEE SPECIAL PROVISIONS.

FOR AS-BUILT PLANS, SEE SPECIAL PROVISIONS.

FOR LOCATION OF NEW FENDER SYSTEM, SEE SPECIAL PROVISIONS.

ALL 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 JANUARY 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.

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 JANUARY 2012.

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

AT LOCATIONS WHERE EXISTING AND PROPOSED PILING COINCIDE, SOME OR ALL OF EXISTING PILING MAY BE REQUIRED TO BE FULLY REMOVED. IF THE EXISTING PILING BREAKS UPON INITIAL EXTRACTION, WITH THE ENGINEER'S APPROVAL PROPOSED PILING MAY BE SHIFTED NOMINALLY TO AVOID BROKEN, EXISTING PILES.

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 TIGHTENED TO FULLY ENGAGE THE O.G. WASHER WITHOUT EXCESSIVE CRUSHING OF THE TIMBER FIBERS.
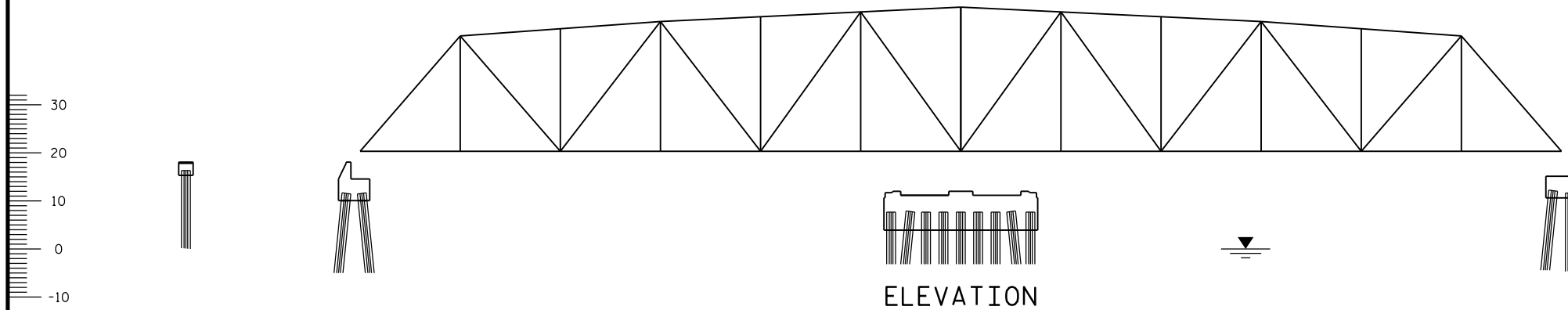
ELEVATION

TAKEN ALONG ℄ OF BRIDGE

TOTAL BILL OF MATERIALS

MOBILIZATION	REMOVAL OF EXISTING FENDER SYSTEM	CONCRETE REPAIRS	INSTALLATION OF TREATED TIMBER CATWALK	INSTALLATION OF TREATED TIMBER COMPONENTS	INSTALLATION OF TREATED TIMBER PILES
LUMP SUM	LUMP SUM	29.3 CU.FT.	LUMP SUM	LUMP SUM	EACH

CHANNEL WIDTH TO MATCH EXISTING

EXISTING FENDER SYSTEM TO BE REPLACED

TO SURF CITY

℄ BENT NO. 5

℄ BENT NO. 6

℄ BRIDGE

END BENT NO. 2

TO HOLLY RIDGE

90°00'00" (TYP.)

79°15'00" (TYP.)

35'-0" (SPAN "F")

126'-3" (SPAN "G")

125'-0" (SPAN "H")

N

DocuSigned by:

William M. Clarke

1EB20097EAAF437...

NORTH CAROLINA
PROFESSIONAL
ENGINEER
SEAL
40257
W. MATTHEW CLARKE

7/24/2015

PROJECT NO. 15B.13.34

PENDER COUNTY

BRIDGE NO. 16

FENDER LAYOUT PLAN

DRAWN BY :	M. A. LEE	DATE :	7/2015
CHECKED BY :	W. M. CLARKE	DATE :	7/2015

24-JUL-2015 13:31
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REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	F-1
1			3			TOTAL SHEETS
2			4			4

Main Layout (Top View)

Dimensions across top: 20'-0" | 7'-0" | 7'-4" | 10'-1" | 11'-1" | 11'-6" | 8'-0" | 96'-0" | *21'-0"

℄ BRIDGE

B ←

6'-0" MAX

℄ FENDER

℄ OF PIVOT PIER

11'-10" (TYP.)
11'-10" (TYP.)
16'-2"
11'-10" (TYP.)
19'-4"
11'-10" (TYP.)
20'-5½"
1'-1½"

5'-8"
12'-1"
5'-11"
5'-11"
17'-9"
11'-10"
5'-8"
1'-5"

7 PILE CLUSTER
SEE NOTE (TYP.)

FRONT FACE OF FENDER TO MATCH EXISTING
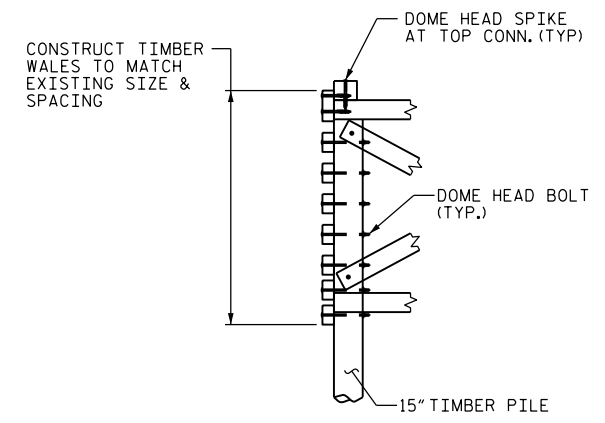
B ←

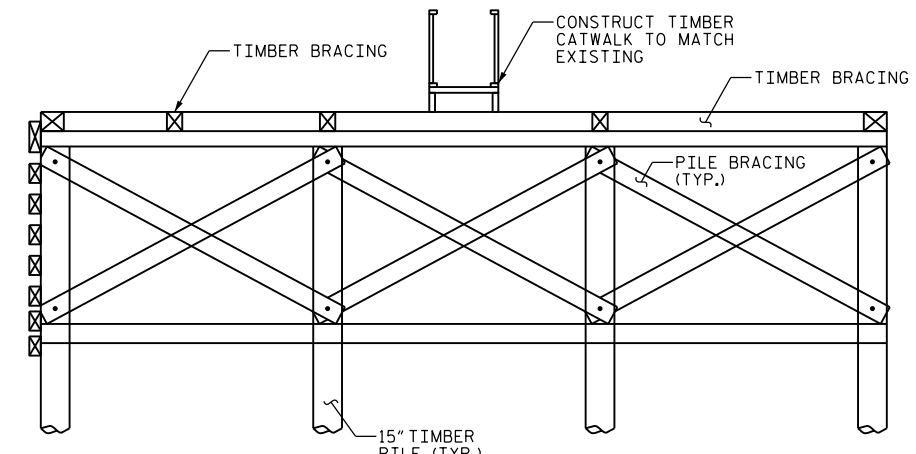8'-0" (TYP.) | 8'-0" (TYP.)
16'-0" (TYP.)
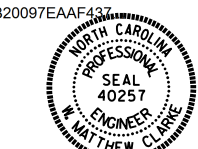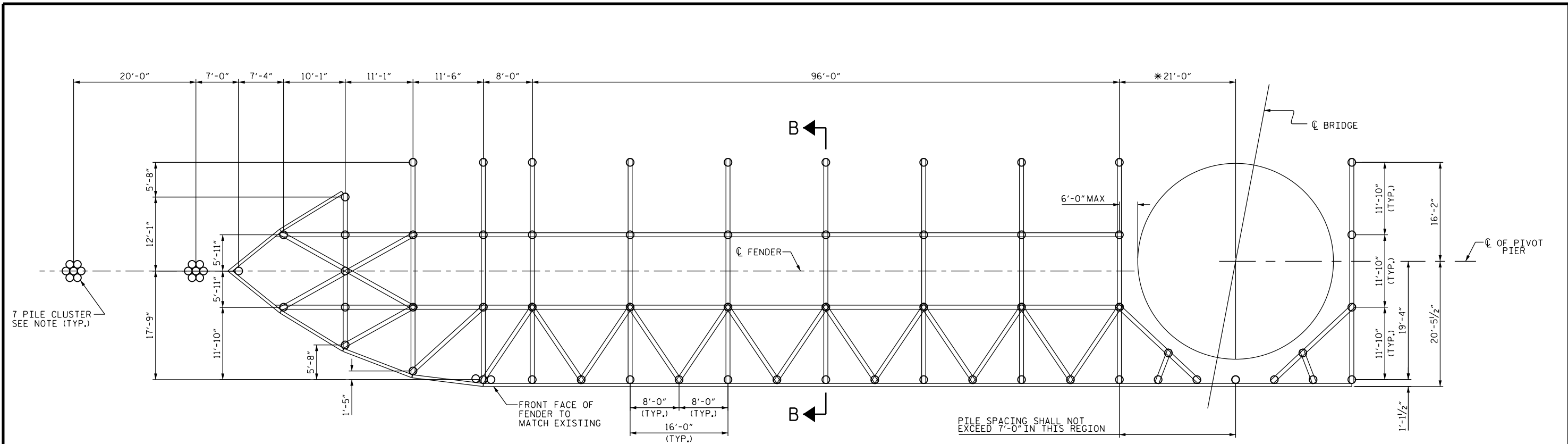
PILE SPACING SHALL NOT EXCEED 7'-0" IN THIS REGION

* THE CONTRACTOR SHALL POSITION PROPOSED FENDER SYSTEM TO AVOID INTERFERENCE WITH EXISTING PILES
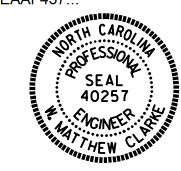
ELEV. OF MAIN WALL

16'-0"
8'-0"

A ←
A ←

SECTION A-A

CONSTRUCT TIMBER WALES TO MATCH EXISTING SIZE & SPACING

DOME HEAD SPIKE AT TOP CONN. (TYP)

DOME HEAD BOLT (TYP.)

15" TIMBER PILE

SECTION B-B

TIMBER BRACING

CONSTRUCT TIMBER CATWALK TO MATCH EXISTING

TIMBER BRACING

PILE BRACING (TYP.)

15" TIMBER PILE (TYP.)
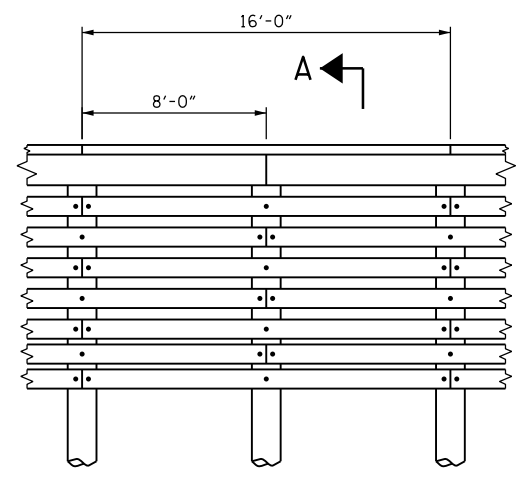
NOTES:

WALKWAY AND RAILING TO BE REPLACED TO MATCH EXISTING; NOT SHOWN FOR CLARITY.

ALL DIMENSIONS SHOWN ARE NORMAL TO FENDER FACE.

THE CONTRACTOR MAY NOMINALLY SHIFT PILES TO AVOID EXISTING PILES THAT CANNOT BE REMOVED DUE TO DAMAGE.

ALL MEASUREMENTS TO BE FIELD VERIFIED AND APPROVED BY ENGINEER PRIOR TO CONSTRUCTION.

EXISTING MEMBERS MAY BE RETAINED IF NOT DAMAGED PER APPROVAL OF THE ENGINEER.

ALL DOME HEADS SHALL BE LOCATED AT THE FRONT FACE OF THE FENDER SYSTEM.

STAGGER TIMBER WALES IN THE MAIN WALL SO THAT ALTERNATE JOINTS BREAK EACH PILE.

DRAWN BY : M.A.LEE   DATE : 7/2015
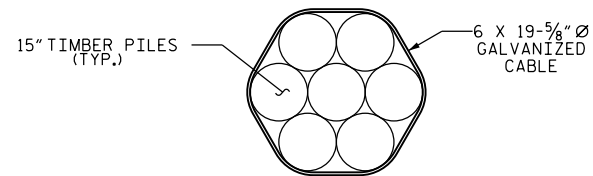CHECKED BY : W.M.CLARKE   DATE : 7/2015
24-JUL-2015 13:31
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DocuSigned by:
William M. Clarke
1EB20097EAAF437...

NORTH CAROLINA
PROFESSIONAL ENGINEER
SEAL
40257
W. MATTHEW CLARKE

7/24/2015

DETAIL OF 7-PILE CLUSTER (DOLPHINS)

15" TIMBER PILES (TYP.)

6 X 19 -⅝" Ø GALVANIZED CABLE

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 -⅝" Ø GALVANIZED CABLE
AT 1'-1" AND 5'-1" FROM TOP OF CLUSTER. CABLE SHALL
BE SECURED WITH ⅜" Ø X 4" GALVANIZED STAPLES AND
THREE WIRE CLAMPS AT EACH END.

THREAD

PROVIDE FINS OR SQUARE SHANKS

2⅝"
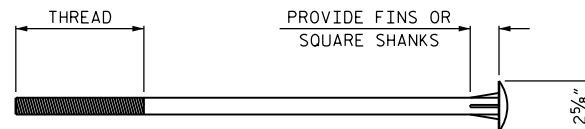
TYPICAL DOME HEAD TIMBER BOLT

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

LENGTH

SLOT FOR 6d GALVANIZED NAIL

2⅝"
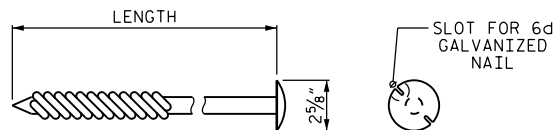
TYPICAL DOME HEAD DRIVE SPIKE

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

PROJECT NO. 15B.13.34

PENDER COUNTY

BRIDGE NO. 16

DocuSigned by:
William M. Clarke
1EB20097EAAF437...

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

FENDER SYSTEM
DETAILS

NORTH CAROLINA
PROFESSIONAL
SEAL
40257
ENGINEER
W. MATTHEW CLARKE

7/24/2015

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

DRAWN BY :	M.A.LEE	DATE : 7/2015
CHECKED BY :	W.M.CLARKE	DATE : 7/2015

24-JUL-2015 13:32
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REPAIR QUANTITY TABLE

REPAIRS PIVOT PIER	QUANTITIES			
	ESTIMATE		ACTUAL	
CONCRETE REPAIRS	AREA SF	VOLUME CF	AREA SF	VOLUME CF
CAP (VERTICAL FACE)	50.3	29.3		
CAP (HORIZONTAL, CORNER)	0.0	0.0		

VALUES IN CHART REPRESENT ESTIMATED REPAIR TOTALS AFTER REMOVAL OF UNSOUND CONCRETE. MIN. OF 1" BEHIND REBAR AND MIN. 2" CL TO SAWCUT. SEE REPAIR DETAILS.

NOTES:

REPAIR LOCATIONS AND ESTIMATE OF QUANTITIES ARE GIVEN WITH THE BEST INFORMATION AVAILABLE. IF ADDITIONAL REPAIRS NOT SHOWN ON THE DRAWINGS ARE DEEMED NECESSARY BY THE INSPECTOR OR ENGINEER THE CONTRACTOR SHALL NOTE ON THE DRAWINGS THE APPROXIMATE LOCATION AND DESCRIPTION OF THE REPAIRS AND ADJUST THE ACTUAL QUANTITIES ENTERED INTO THE REPAIR QUANTITY TABLE.

FOR "CONCRETE REPAIRS", SEE SPECIAL PROVISIONS.

ALL REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO CONCRETE REPAIR.

THE CONTRACTOR SHALL USE ADHESIVELY ANCHORED DOWELS AS INDICATED IN THE PLANS.

DIMENSIONS FOR ADHESIVELY ANCHORED DOWELS ASSUME 9" EMBEDMENT. FOR ACTUAL EMBEDMENT LENGTH, FOLLOW MANUFACTURER'S RECOMMENDATIONS AND ADJUST LENGTH ACCORDINGLY.
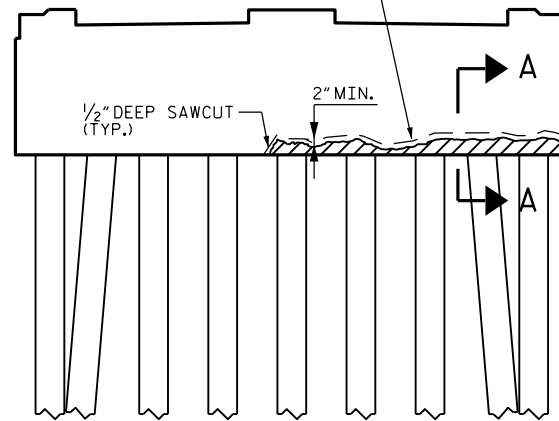
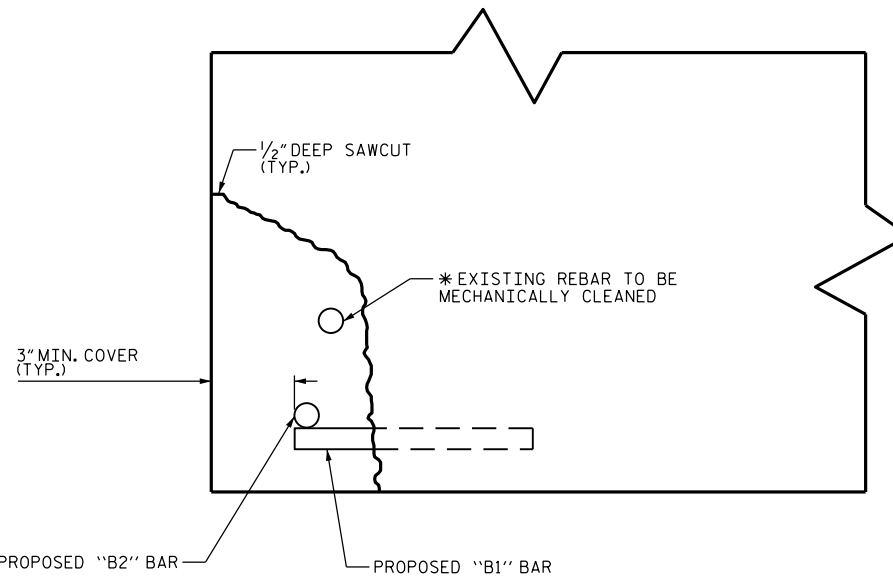CUT AND BEND REINFORCING STEEL IN THE FIELD.

SPALLED, DELAMINATED OR CRACKED CONCRETE (REMOVE UNTIL SOUND CONC. IS FOUND AND A MIN. 1" BEHIND ANY EXPOSED REBAR).

1/2" DEEP SAWCUT (TYP.)

2" MIN.

A

PIER CAP REPAIR (ELEVATION)

1/2" DEEP SAWCUT (TYP.)

✳ EXISTING REBAR TO BE MECHANICALLY CLEANED

3" MIN. COVER (TYP.)

PROPOSED "B2" BAR

PROPOSED "B1" BAR

SECTION A-A

1/2" DEEP SAWCUT (TYP.)

28'-3"

2" MIN.

SPALLED, DELAMINATED OR CRACKED CONCRETE (REMOVE UNTIL SOUND CONC. IS FOUND AND A MIN. 1" BEHIND ANY EXPOSED REBAR).

PIER CAP REPAIR (PLAN)
BOTTOM OF PIER
PILES NOT SHOWN FOR CLARITY

#4 "B1" BAR ▲ @ 18" CTS. (TYP.)

#4 "B2" BAR

2'-2" SPLICE LENGTH

PROPOSED REPAIR
BOTTOM OF PIER

▲ ADHESIVELY ANCHORED

BILL OF MATERIAL

PIVOT PIER REPAIR

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
✳ B1	18	#4	STR	1'-4"	16
✳ B2	2	#4	STR	18'-7"	25

✳ EPOXY COATED REINFORCING STEEL = 41 LBS.

THE REINFORCING BILL OF MATERIAL QUANTITY IS AN ESTIMATE BASED ON A PROVIDED FIELD SKETCH. THE CONTRACTOR SHALL VERIFY THE CORRECT LENGTH OF REQUIRED REINFORCING STEEL UPON REMOVAL OF UNSOUND CONCRETE.
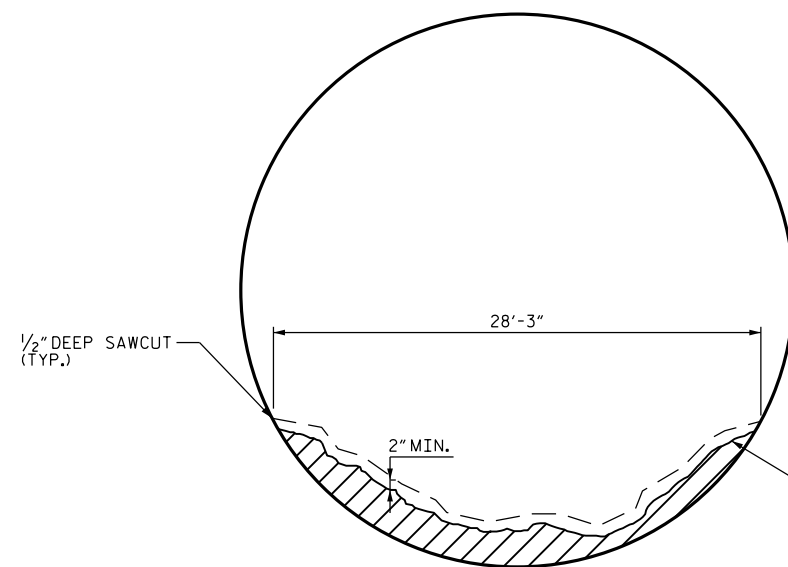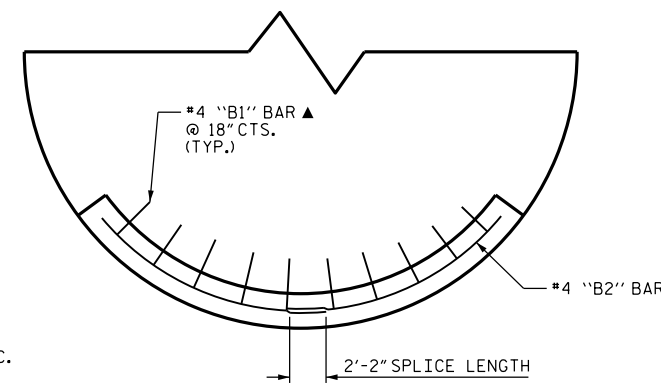
PROJECT NO. 15B.13.34

PENDER COUNTY

BRIDGE NO. 16

DocuSigned by:
William M. Clarke
1EB20097EAAF437...

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PIVOT PIER REPAIR DETAILS

NORTH CAROLINA
PROFESSIONAL
SEAL
40257
ENGINEER
W. MATTHEW CLARKE

7/24/2015

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1			3			
2			4			TOTAL SHEETS 4