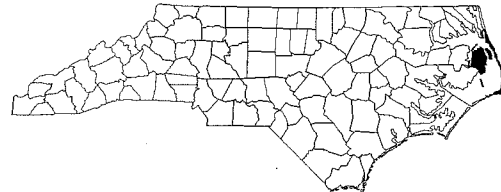


WBS: 45448.3.1

CONTRACT: DA00249

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

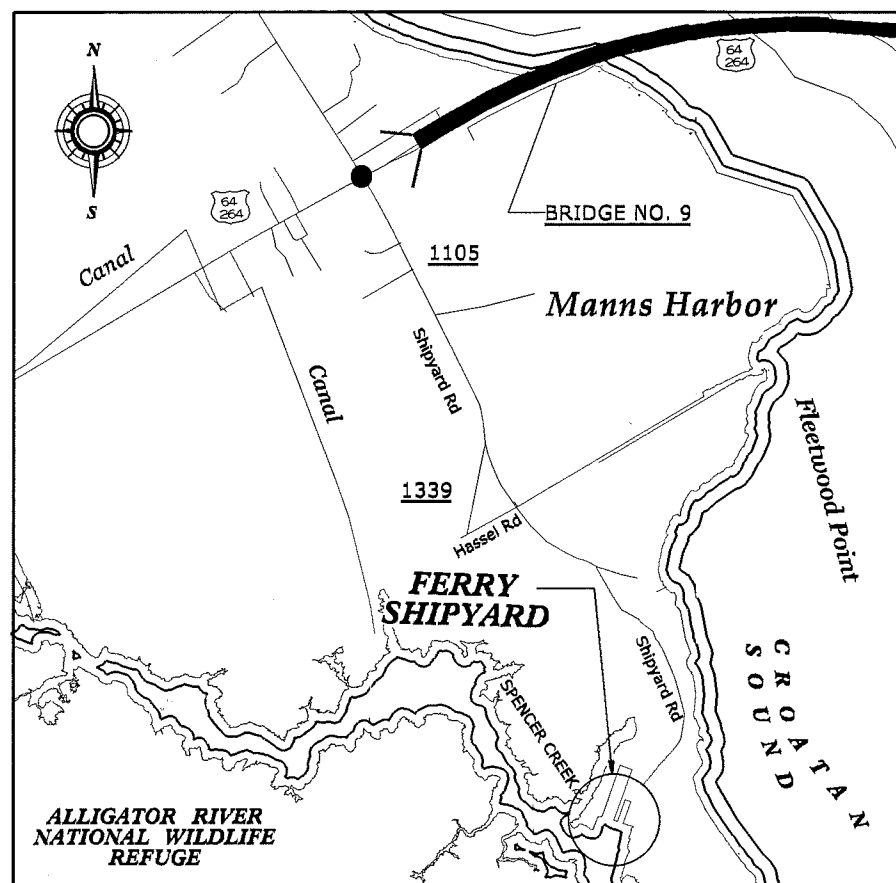


DARE COUNTY

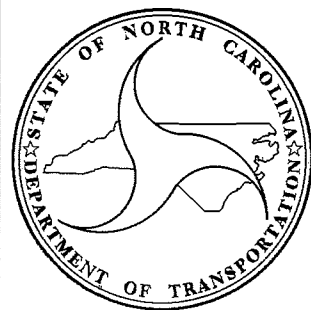
| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|-----------------|-----------------------------|-------------|--------------|
| N.C. | | 1 | |
| STATE PROJ. NO. | F.A. PROJ. NO. | DESCRIPTION | |
| 16SP.29161.1 | — | P.E. | |
| 45448.3.1 | — | CONST. | |
| | | | |
| | | | |
| | | | |

LOCATION: DARE COUNTY:
MANN'S HARBOR FERRY SHIPYARD SYNCROLIFT DOCK

TYPE OF WORK: PARTIAL REMOVAL OF EXISTING TIMBER FENDER SYSTEM, INSTALLATION OF VINYL SHEET PILES, INSTALLATION OF TIMBER FENDER SYSTEM.



VICINITY MAP - DARE CO.



DESIGN DATA

DARE COUNTY

PROJECT LENGTH

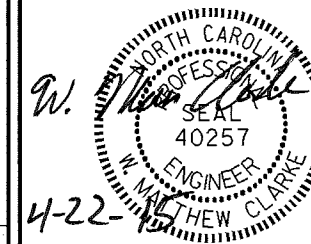
DARE COUNTY

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

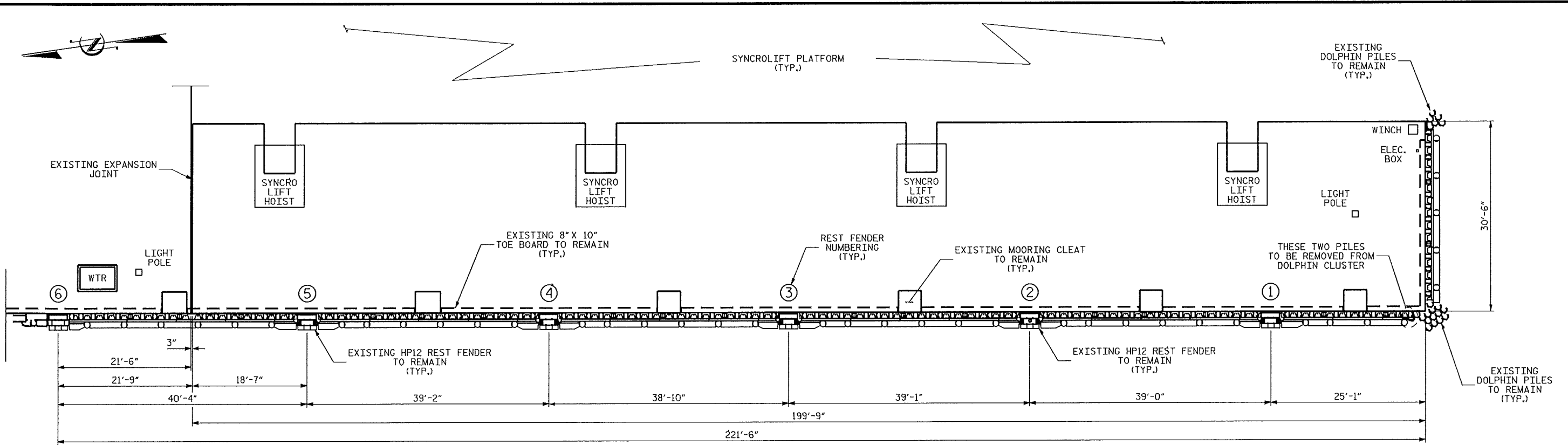
TIMOTHY M. SHERRILL, P.E.
PROJECT ENGINEER

2012 STANDARD SPECIFICATIONS

LETTING DATE:
MAY 20, 2015



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



PLAN

GENERAL NOTES:

- FOR SECURING OF VESSELS, SEE SPECIAL PROVISIONS.
- FOR PARTIAL 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 WIRE ROPE FOR FENDER SYSTEM, SEE SPECIAL PROVISIONS.
- FOR VINYL SHEET PILE, SEE SPECIAL PROVISIONS.
- FOR FENDER REPLACEMENT, 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 OGEE 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 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.
- ALL OVAL HEAD TIMBER BOLTS SHALL BE TIGHTENED TO FULLY ENGAGE THE OGEE WASHER WITHOUT EXCESSIVE CRUSHING OF THE TIMBER FIBERS.

| TOTAL BILL OF MATERIAL | | | | | | | |
|------------------------|---|-------------------------|-------------------------|------------------------|--------------------------|----------|------------------|
| MOBILIZATION | PARTIAL REMOVAL OF EXISTING FENDER SYSTEM | 12" TREATED TIMBER PILE | 4" X 12" TREATED LUMBER | 8" X 8" TREATED LUMBER | 12" X 12" TREATED LUMBER | HARDWARE | VINYL SHEET PILE |
| LUMP SUM | LUMP SUM | LF | BRD FT | BRD FT | BRD FT | LB | SF |
| LUMP SUM | LUMP SUM | 1,152 | 1,657 | 614 | 2,344 | 1,831 | 8,187 |

PROJECT NO. 16SP.29161.1
 DARE COUNTY
 BRIDGE NO. -

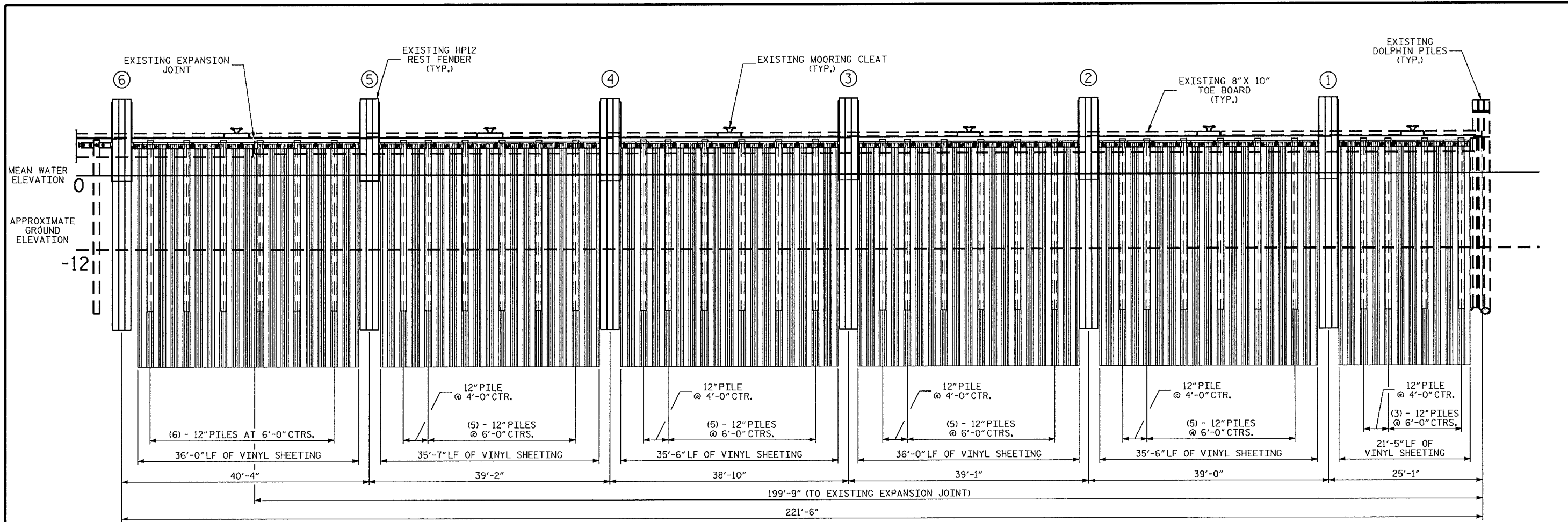
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING

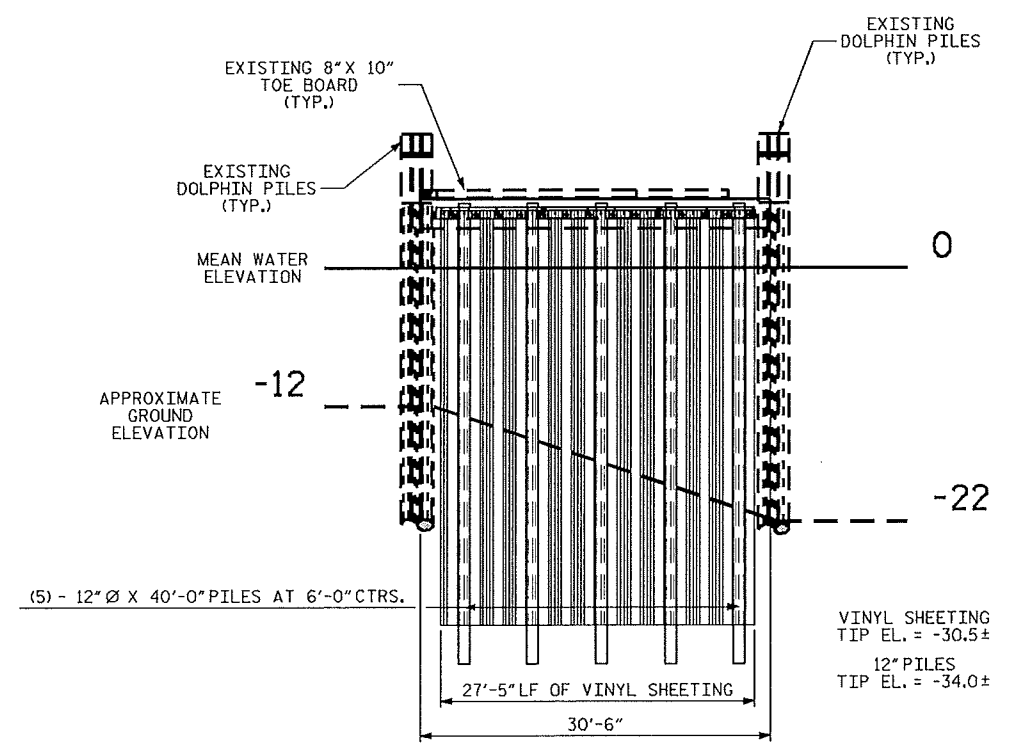
| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-1 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 9 |

W. M. Clarke
 4-16-15
 NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 40257
 MATTHEW CLARKE

DRAWN BY : R. PUTEK DATE : 01/15
 CHECKED BY : W.M. CLARKE DATE : 03/15



ELEVATION
(WEST FACE SYNCROLIFT DOCK)



ELEVATION
(SOUTH FACE SYNCROLIFT DOCK)

PROJECT NO. 16SP.29161.1
DARE COUNTY
BRIDGE NO. -

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

ELEVATION

DRAWN BY : R.PUTEK DATE : 01/15
CHECKED BY : W.M.CLARKE DATE : 03/15

W. Moore Clarke
4-16-15

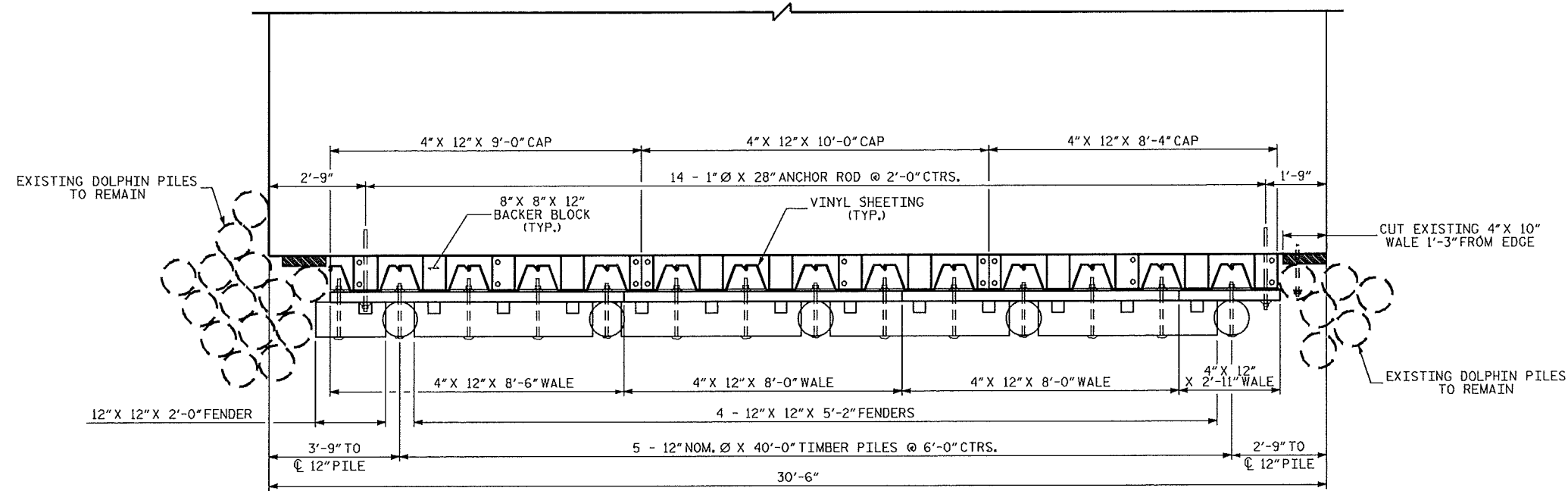
NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 40257 MATTHEW CLARKE

| REVISIONS | | | | SHEET NO. | |
|-----------|----|------|-----|-----------|-------------------|
| NO. | BY | DATE | NO. | BY | DATE |
| 1 | | | 3 | | |
| 2 | | | 4 | | |
| | | | | | TOTAL SHEETS 9 |

NOTE:
 ALL ANCHOR RODS NOT SHOWN FOR CLARITY.
 EXISTING TOE BOARD NOT SHOWN FOR CLARITY.
 EXISTING MOORING CLEATS NOT SHOWN FOR CLARITY.



ALL EXISTING 8" X 10" HORIZONTAL TIMBERS SHOWN ATTACHED TO THE SIDES OF THE EXISTING HP12 REST FENDERS SHALL BE REMOVED, NOTCHED AS SHOWN ON 'DETAILS SHEET', AND REPLACED. PAYMENT FOR THIS ITEM SHALL BE INCIDENTAL TO THE INSTALLATION OF THE FENDER SYSTEM.



PLAN
 (SOUTH FACE OF SYNCROLIFT DOCK)

PROJECT NO. 16SP.29161.1

DARE COUNTY

BRIDGE NO. -

SHEET 1 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

PLAN VIEW
 SOUTH FACE OF
 SYNCROLIFT DOCK

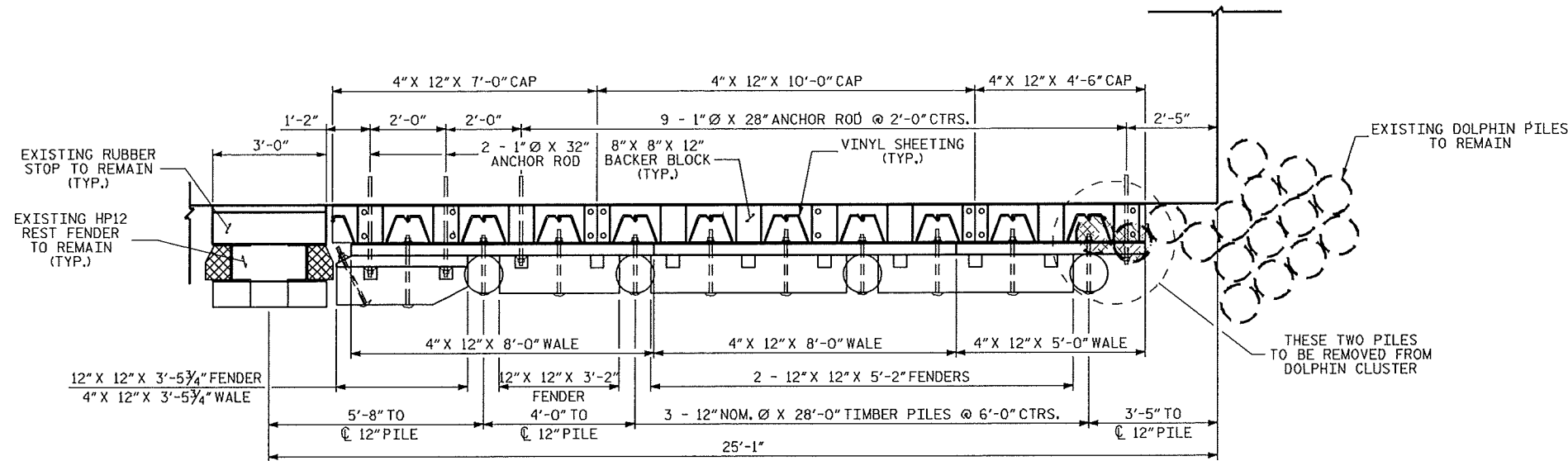
W. Matthew Clarke
 4-16-15



DRAWN BY : R.PUTEK DATE : 02/15
 CHECKED BY : W.M.CLARKE DATE : 03/15

| REVISIONS | | | | SHEET NO. | |
|-----------|----|------|-----|-----------|--------------|
| NO. | BY | DATE | NO. | BY | DATE |
| 1 | | | 3 | | |
| 2 | | | 4 | | |
| | | | | | TOTAL SHEETS |
| | | | | | 9 |

NOTE:
 ALL ANCHOR RODS NOT SHOWN FOR CLARITY.
 EXISTING TOE BOARD NOT SHOWN FOR CLARITY.
 EXISTING MOORING CLEATS NOT SHOWN FOR CLARITY.

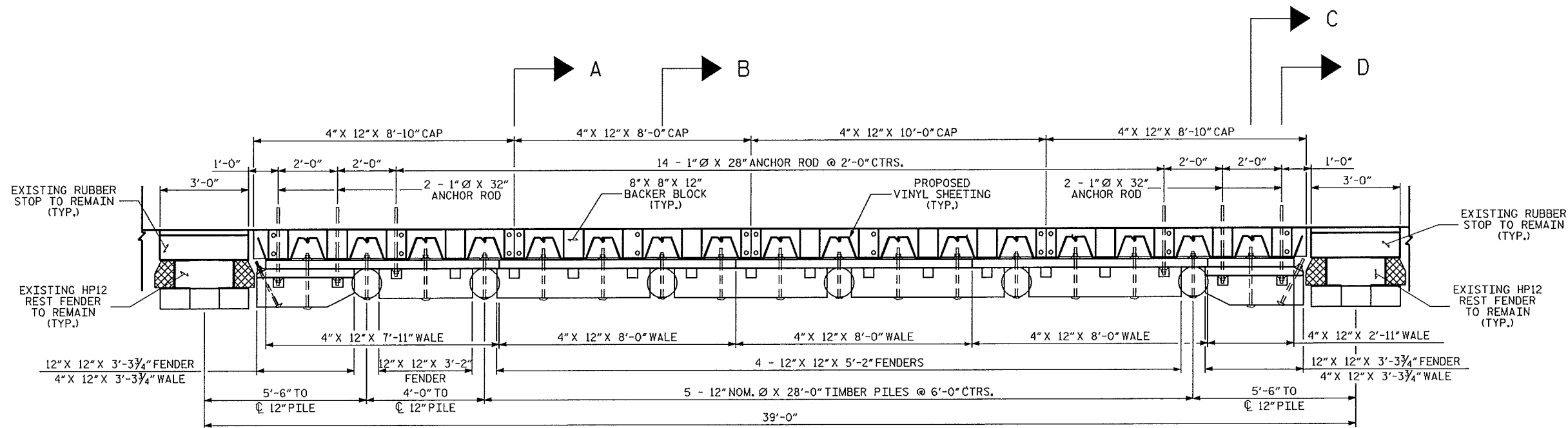


ALL EXISTING 8" X 10" HORIZONTAL TIMBERS SHOWN ATTACHED TO THE SIDES OF THE EXISTING HP12 REST FENDERS SHALL BE REMOVED, NOTCHED AS SHOWN ON 'DETAILS SHEET', AND REPLACED. PAYMENT FOR THIS ITEM SHALL BE INCIDENTAL TO THE INSTALLATION OF THE FENDER SYSTEM.

①

PLAN

(WEST FACE OF SYNCOLIFT DOCK)



②

PLAN

(WEST FACE OF SYNCOLIFT DOCK)

PROJECT NO. 16SP.29161.1

DARE COUNTY

BRIDGE NO. -

SHEET 2 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

PLAN VIEW
 WEST FACE OF
 SYNCOLIFT DOCK

E. M. Clarke
 4-16-15



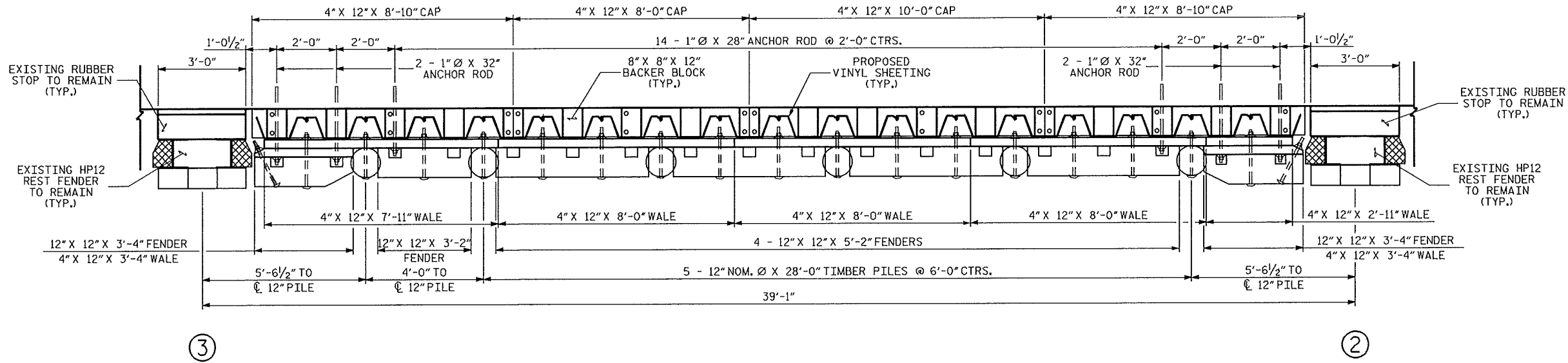
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 CHECKED BY : W.M. CLARKE DATE : 03/15

| REVISIONS | | | | SHEET NO. |
|-----------|-----|-------|---------------|--------------|
| NO. | BY: | DATE: | NO. BY: DATE: | S-4 |
| 1 | | | 3 | TOTAL SHEETS |
| 2 | | | 4 | 9 |

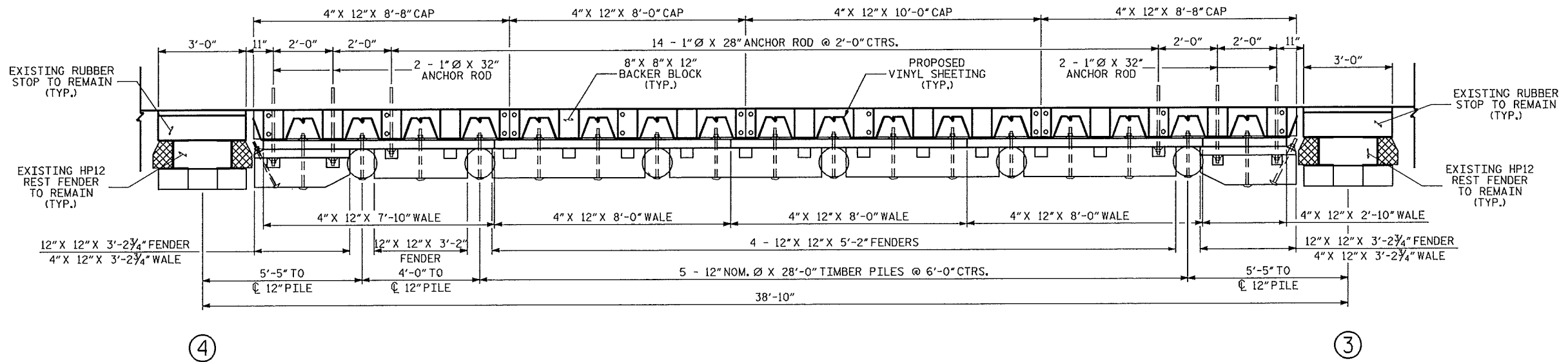
NOTE:
 ALL ANCHOR RODS NOT SHOWN FOR CLARITY.
 EXISTING TOE BOARD NOT SHOWN FOR CLARITY.
 EXISTING MOORING CLEATS NOT SHOWN FOR CLARITY.



ALL EXISTING 8" X 10" HORIZONTAL TIMBERS SHOWN ATTACHED TO THE SIDES OF THE EXISTING HP12 REST FENDERS SHALL BE REMOVED, NOTCHED AS SHOWN ON 'DETAILS SHEET', AND REPLACED. PAYMENT FOR THIS ITEM SHALL BE INCIDENTAL TO THE INSTALLATION OF THE FENDER SYSTEM.



PLAN
 (WEST FACE OF SYNCOLIFT DOCK)



PLAN
 (WEST FACE OF SYNCOLIFT DOCK)

PROJECT NO. 16SP.29161.1
 DARE COUNTY
 BRIDGE NO. -
 SHEET 3 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

PLAN VIEW
 WEST FACE OF
 SYNCOLIFT DOCK

| REVISIONS | | | | SHEET NO. |
|-----------|-----|-------|-----|-----------|
| NO. | BY: | DATE: | NO. | DATE: |
| 1 | | | 3 | |
| 2 | | | 4 | |

S-5
 TOTAL SHEETS
 9

W. M. Clarke
 4-16-15
 NORTH CAROLINA
 PROFESSIONAL
 SEAL
 40257
 ENGINEER
 W. MATTHEW CLARKE

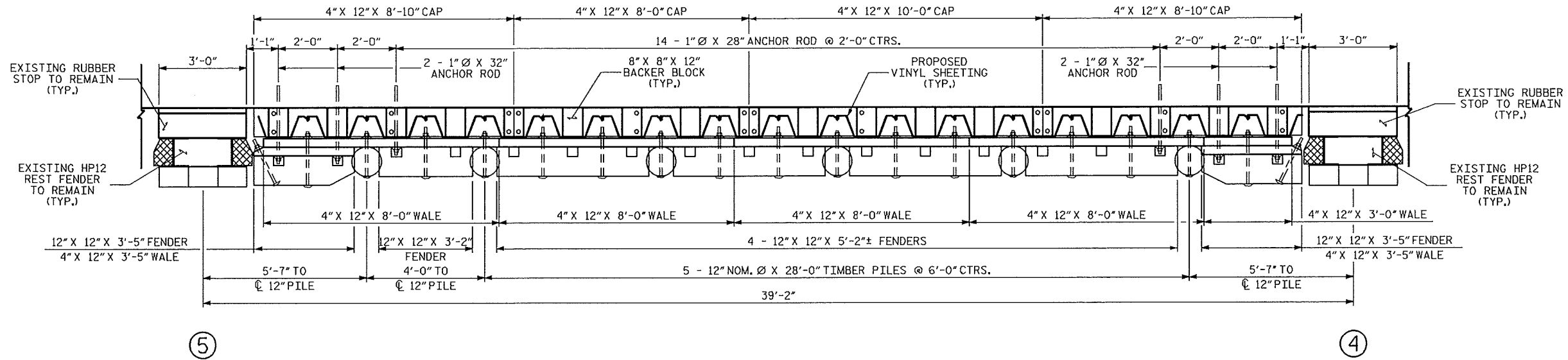
DRAWN BY : R. PUTEK DATE : 02/15
 CHECKED BY : W.M. CLARKE DATE : 03/15

16-APR-2015 18:00
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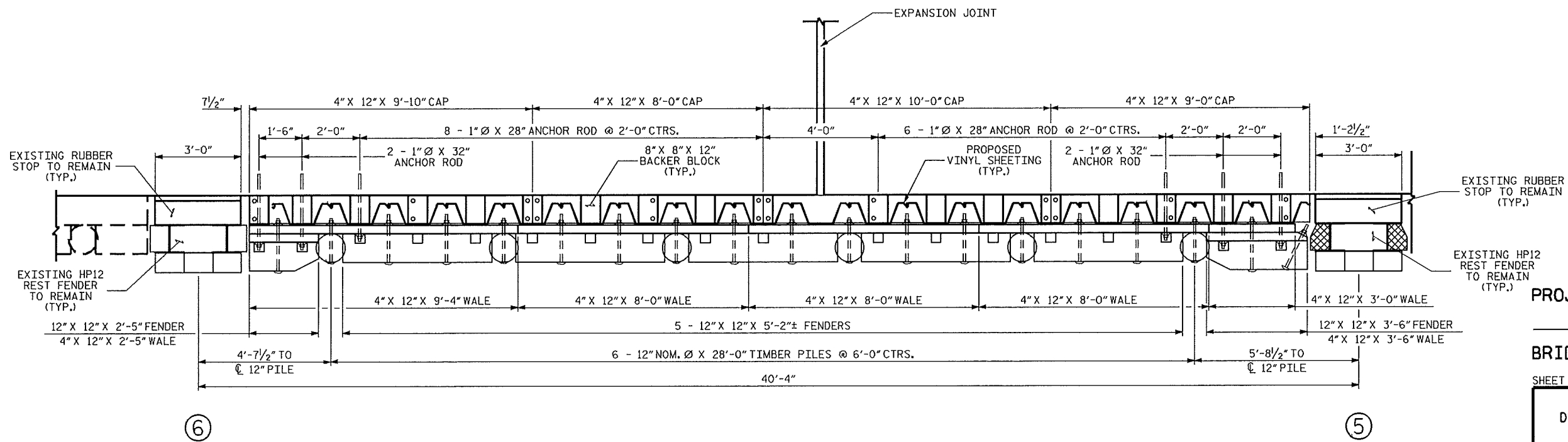
NOTE:
 ALL ANCHOR RODS NOT SHOWN FOR CLARITY.
 EXISTING TOE BOARD NOT SHOWN FOR CLARITY.
 EXISTING MOORING CLEATS NOT SHOWN FOR CLARITY.



ALL EXISTING 8" X 10" HORIZONTAL TIMBERS SHOWN ATTACHED TO THE SIDES OF THE EXISTING HP12 REST FENDERS SHALL BE REMOVED, NOTCHED AS SHOWN ON 'DETAILS SHEET', AND REPLACED. PAYMENT FOR THIS ITEM SHALL BE INCIDENTAL TO THE INSTALLATION OF THE FENDER SYSTEM.



PLAN
 (WEST FACE OF SYNCOLIFT DOCK)



PLAN
 (WEST FACE OF SYNCOLIFT DOCK)

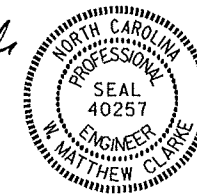
PROJECT NO. 16SP.29161.1
 DARE COUNTY
 BRIDGE NO. -

SHEET 4 OF 4

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

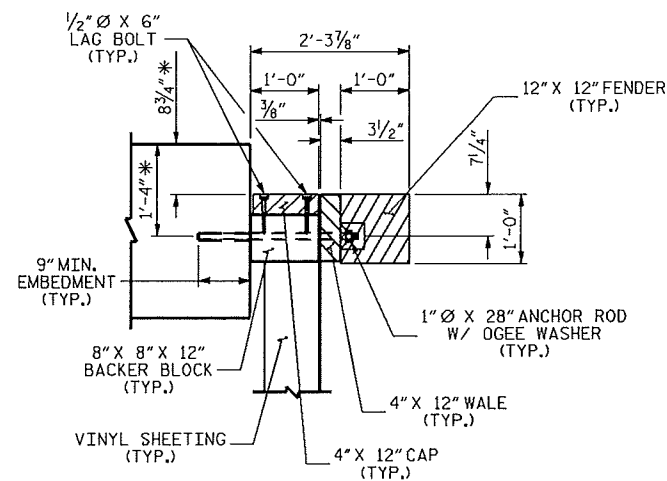
PLAN VIEW
 WEST FACE OF
 SYNCOLIFT DOCK

W. Wood Clarke
 4-16-15

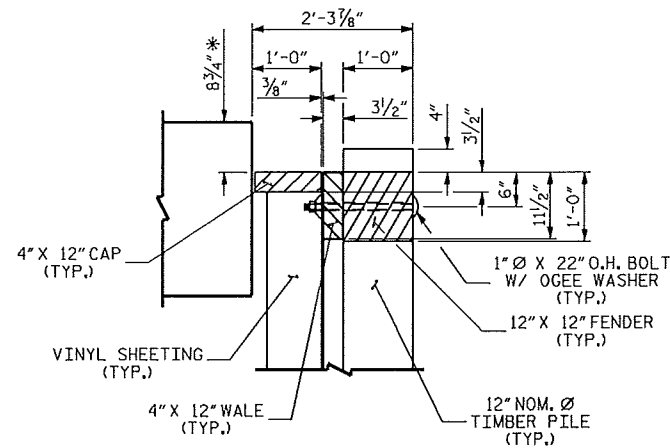


DRAWN BY : R.PUTEK DATE : 02/15
 CHECKED BY : W.M.CLARKE DATE : 03/15

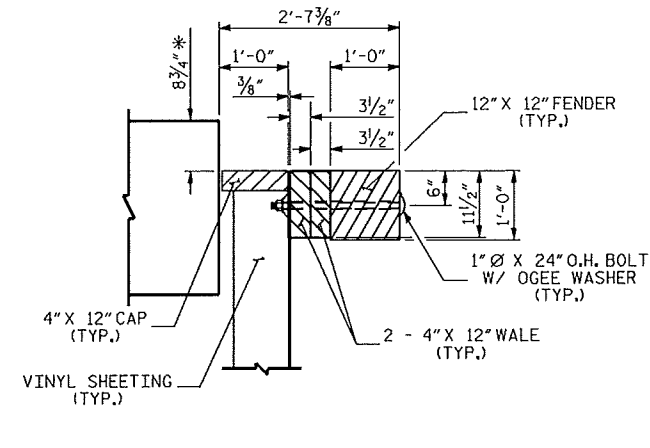
| REVISIONS | | | | | | SHEET NO. |
|-----------|----|------|-----|----|------|--------------|
| NO. | BY | DATE | NO. | BY | DATE | TOTAL SHEETS |
| 1 | | | 3 | | | 5-6 |
| 2 | | | 4 | | | 9 |



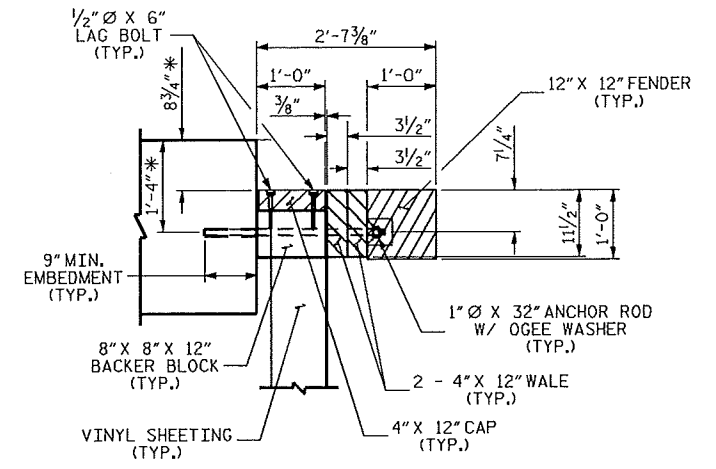
SECTION A-A



SECTION B-B



SECTION C-C

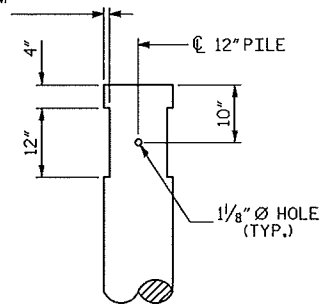


SECTION D-D

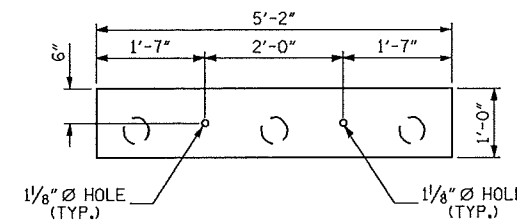
* ϕ OF 1" ϕ ANCHOR RODS TO BE PLACED 1'-4" BELOW TOP OF CAP, OR 3" ABOVE EXISTING ANCHOR RODS AFTER CUTTING OFF AND COVERING WITH AN APPROVED SEALANT

** THESE FENDERS TO BE FIELD CUT TO DIMENSIONS SHOWN AT EXISTING REST FENDERS ON PLAN VIEW SHEETS.

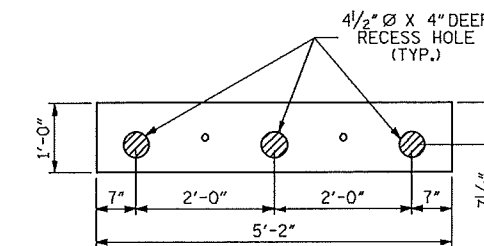
NOTCH PILE 1" MINIMUM TO 3" MAXIMUM FOR 12" X 12" FENDER



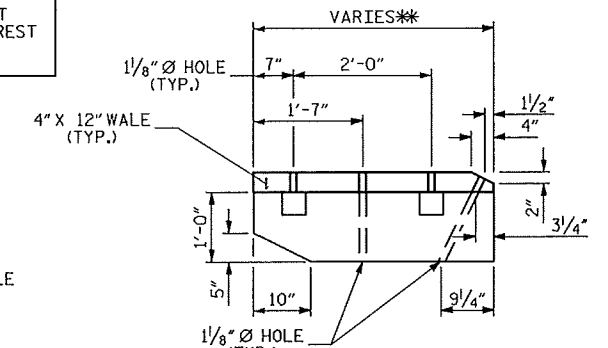
PILE NOTCHING



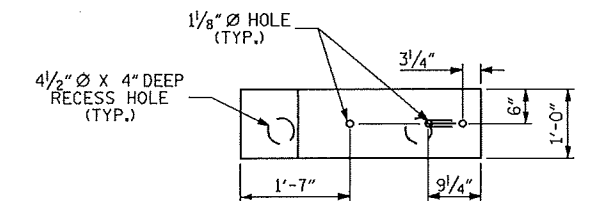
FACE OF FENDER



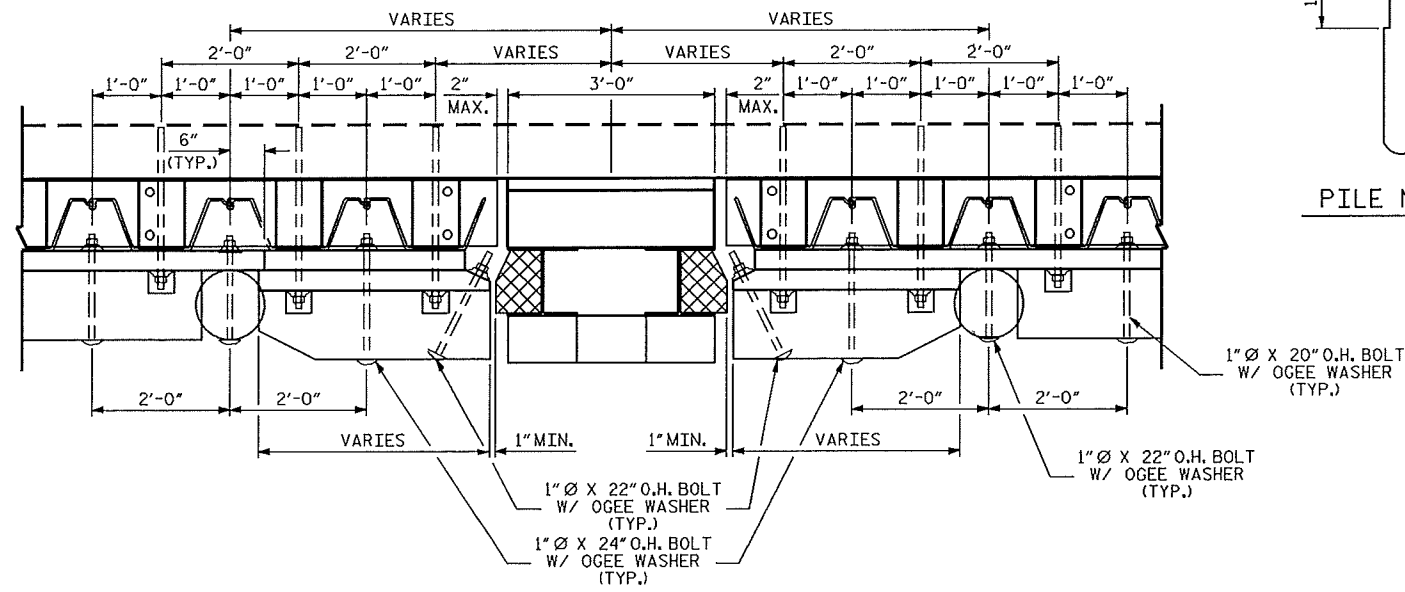
BACKSIDE OF FENDER



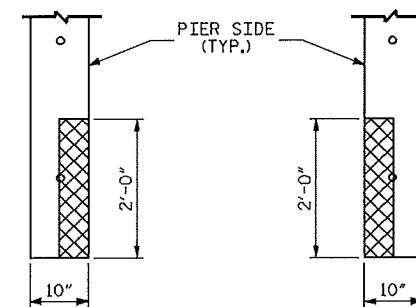
TOP OF FENDER



FACE OF FENDER



TYPICAL LAYOUT AT REST FENDER

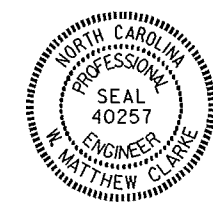


BEVEL OF EXISTING FENDER

PROJECT NO. 16SP.29161.1
DARE COUNTY
BRIDGE NO. -

SHEET 1 OF 2

W. Matthew Clarke
4-16-15



| STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH | | | | |
|--|----|------|-----|------|
| DETAILS | | | | |
| REVISIONS | | | | |
| NO. | BY | DATE | NO. | DATE |
| 1 | | | 3 | |
| 2 | | | 4 | |

| | |
|--------------|-----|
| SHEET NO. | S-7 |
| TOTAL SHEETS | 9 |

DRAWN BY : R.PUTEK DATE : 03/15
CHECKED BY : M.W.CLARKE DATE : 03/15

NOTES:

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

ALL CABLES SHALL BE SECURED WITH 3/4" X 4" GALVANIZED STAPLES AND TWO WIRE CLAMPS AT EACH END.

ANCHOR BOLTS SHALL BE ADHESIVELY ANCHORED; SEE STANDARD SPECIFICATIONS. ADHESIVE FOR ANCHOR BOLTS SHALL BE A NC DOT - APPROVED PRODUCT. FIELD TESTING WILL NOT BE REQUIRED FOR INSTALLATION OF ADHESIVELY ANCHORED BOLTS.

AFTER PARTIAL REMOVAL OF THE EXISTING FENDER SYSTEM, CUT EXISTING ANCHOR BOLTS FLUSH WITH CONCRETE DOCK AND COAT WITH AN NC DOT - APPROVED EPOXY SEALANT.

BILL OF MATERIAL

| TREATED LUMBER | | | | | | | TREATED TIMBER PILES | | | | | HARDWARE | | | | |
|---------------------------------------|--------|----------------|------------|-------------|----------------|-----------------|---------------------------------------|-----|------------------|-------------|------------------------|---------------------------|------|----------|--------|--------|
| ITEM | NO. | THICKNESS (IN) | WIDTH (IN) | LENGTH (FT) | BOARD FT. (EA) | TOTAL BOARD FT. | ITEM | NO. | NOMINAL DIAMETER | LENGTH (FT) | TOTAL PILE LENGTH (LF) | ITEM | NO. | DIAMETER | LENGTH | WEIGHT |
| 4" X 12" CAP | 1 | 3 1/2" | 11 1/2" | 4'-6" | 15.09 | 15.1 | TREATED TIMBER PILES | 34 | 12" | 28'-0" | 952.0 | ANCHOR ROD | 93 | 1" | 28" | 560.9 |
| | 1 | 3 1/2" | 11 1/2" | 7'-0" | 23.48 | 23.5 | | 5 | 12" | 40'-0" | 200.0 | ANCHOR ROD | 22 | 1" | 32" | 152.3 |
| | 5 | 3 1/2" | 11 1/2" | 8'-0" | 26.83 | 134.2 | TOTAL LENGTH TIMBER PILES = 1152.0 LF | | | | | O.H. BOLT | 60 | 1" | 20" | 286.7 |
| | 1 | 3 1/2" | 11 1/2" | 8'-4" | 27.95 | 28.0 | VINYL SHEETING | | | | | O.H. BOLT | 49 | 1" | 22" | 256.0 |
| | 2 | 3 1/2" | 11 1/2" | 8'-8" | 29.07 | 58.1 | ITEM | NO. | WIDTH (IN) | LENGTH (FT) | TOTAL (SF) | O.H. BOLT | 11 | 1" | 24" | 62.4 |
| | 6 | 3 1/2" | 11 1/2" | 8'-10" | 29.63 | 177.8 | TOTAL VINYL SHEETING = 8,187.0 SF | | | | | OGEE WASHERS | 235 | 1" | | 442.4 |
| | 2 | 3 1/2" | 11 1/2" | 9'-0" | 30.19 | 60.4 | LAG BOLTS | 154 | 1/2" | 6" | 53.1 | 3/4" CABLE CLAMPS | 4 | | | 4.0 |
| 1 | 3 1/2" | 11 1/2" | 9'-10" | 32.98 | 33.0 | | | | | | WIRE ROPE | 1 | 3/4" | 12'-0" | 12.0 | |
| 7 | 3 1/2" | 11 1/2" | 10'-0" | 33.54 | 234.8 | | | | | | 3/4" X 4" STAPLES | 4 | | 4" | 1.2 | |
| 4" X 12" WALE | 7 | 3 1/2" | 11 1/2" | 3'-0" | 10.06 | 70.4 | | | | | | TOTAL WEIGHT = 1,831.0 LB | | | | |
| | 11 | 3 1/2" | 11 1/2" | 3'-6" | 11.74 | 129.1 | | | | | | | | | | |
| | 1 | 3 1/2" | 11 1/2" | 5'-0" | 16.77 | 16.8 | | | | | | | | | | |
| | 1 | 3 1/2" | 11 1/2" | 7'-10" | 26.27 | 26.3 | | | | | | | | | | |
| | 2 | 3 1/2" | 11 1/2" | 7'-11" | 26.55 | 53.1 | | | | | | | | | | |
| 8" X 8" BACKER BLOCK | 20 | 3 1/2" | 11 1/2" | 8'-0" | 26.83 | 536.7 | | | | | | | | | | |
| | 1 | 3 1/2" | 11 1/2" | 8'-6" | 28.51 | 28.5 | | | | | | | | | | |
| | 1 | 3 1/2" | 11 1/2" | 9'-4" | 31.31 | 31.3 | | | | | | | | | | |
| | 114 | 8" | 8" | 1'-0" | 5.33 | 608.0 | | | | | | | | | | |
| 1 | 8" | 8" | 1'-0 3/8" | 5.50 | 5.5 | | | | | | | | | | | |
| 12" X 12" FENDER | 1 | 12" | 12" | 2'-0" | 24.00 | 24.0 | | | | | | | | | | |
| | 1 | 12" | 12" | 3'-0" | 36.00 | 36.0 | | | | | | | | | | |
| | 5 | 12" | 12" | 3'-2" | 38.00 | 190.0 | | | | | | | | | | |
| | 10 | 12" | 12" | 3'-6" | 42.00 | 420.0 | | | | | | | | | | |
| | 27 | 12" | 12" | 5'-2" | 62.00 | 1674.0 | | | | | | | | | | |
| TOTAL TREATED LUMBER = 4,614.5 BRD FT | | | | | | | | | | | | | | | | |

NOTE:

ALL TREATED LUMBER 4" X 12" WALES AND 12" X 12" FENDERS SHOWN ON PLANS UNDER THE LENGTH OF 3'-0" OR 3'-6" UNLESS OTHERWISE DESCRIBED, ARE TO BE CONSTRUCTED FROM THE 3'-0" OR 3'-6" PIECES SPECIFIED.

PROJECT NO. 16SP.29161.1

DARE COUNTY

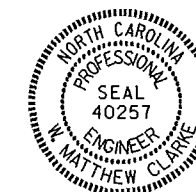
BRIDGE NO. -

SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

DETAILS

W. M. Clarke
4-16-15



DRAWN BY : R. PUTEK DATE : 03/15
CHECKED BY : W.M. CLARKE DATE : 03/15

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | TOTAL SHEETS |
| 1 | | | 3 | | | 9 |
| 2 | | | 4 | | | |