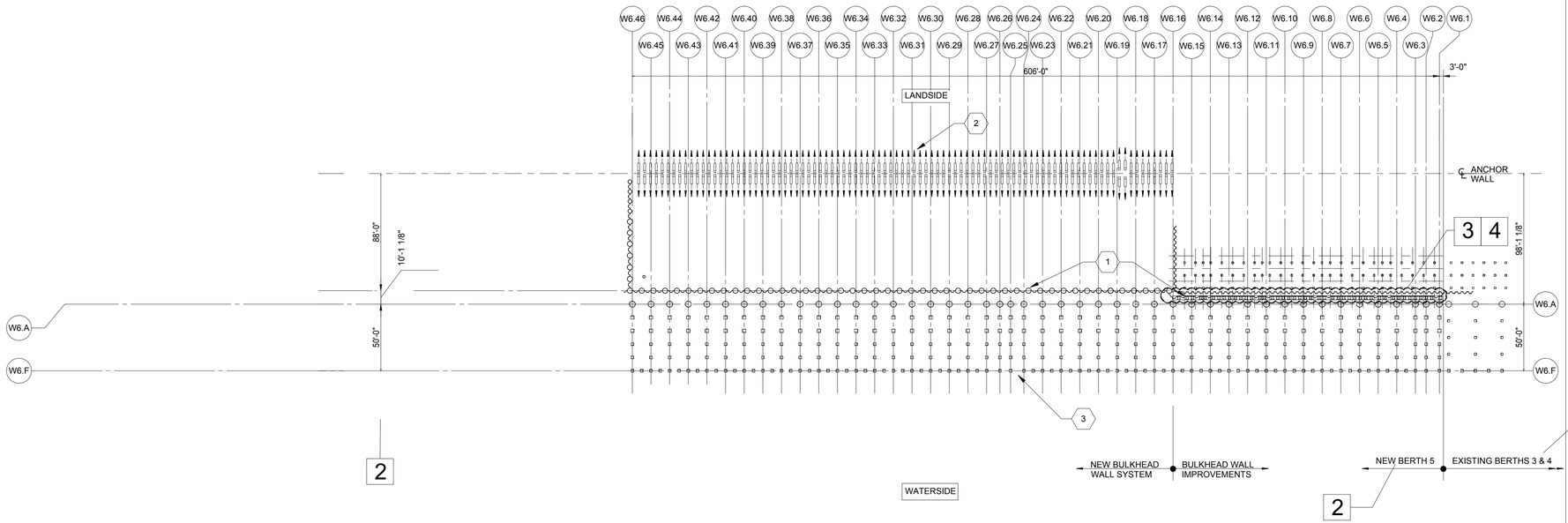
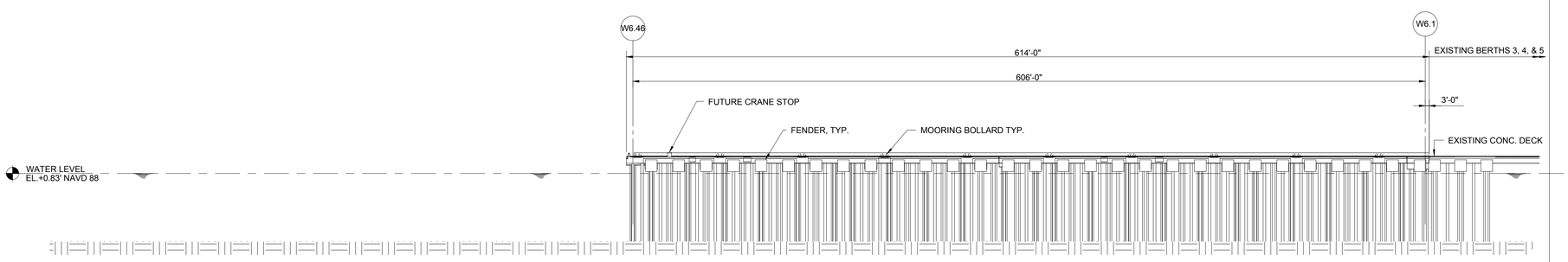



## 1 OVERALL PILE PLAN
SCALE: 1" = 50'-0"




## 2 OVERALL FRONT ELEVATION
SCALE: 1" = 50'-0"

## KEYED NOTES

1. REFER TO S 300 FOR BULKHEAD WALL SYSTEM KING PILE LAYOUT
2. REFER TO S 300 FOR ANCHOR WALL BATTERED PILE LAYOUT
3. REFER TO S 400 FOR WHARF DECK PILE LAYOUT
4. REFER TO S 500 FOR BREASTING/MOORING DOLPHIN PILE LAYOUT
5. REFER TO S 501 FOR MOORING DEADMAN PILE LAYOUT

2 PLANS MODIFIED TO REMOVE RAILROAD TRESTLE AND MODIFY BERTH LIMITS
APRIL 7, 2017
TEXAS REGISTERED ENGINEERING FIRM F-9791

1 PLANS MODIFIED TO DELINEATE BERTH 5 LIMITS OF WORK FOR SEPARATE BID AND PLAN MODIFICATIONS
APRIL 7, 2017
TEXAS REGISTERED ENGINEERING FIRM F-9791

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PORT ARTHUR INTERNATIONAL PUBLIC PORT

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P.O. Box 1428
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Lockwood, Andrews & Newnam, Inc.
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Collins Engineers, Inc.
Texas Registered Engineering Firm F-9791

## REVISIONS

| NO. | DESCRIPTION | DATE |
|---|---|---|
| 0 | ISSUE FOR CONSTRUCTION | 04/21/16 |
| 1 | ISSUE FOR SEPARATE BID | 04/07/17 |
| 2 | REMOVED RAILROAD TRESTLE | 04/07/17 |
| 3 | MODIFIED COMBINATION WALL LAYOUT | 08/25/17 |
| 4 | MODIFIED COMBINATION WALL LAYOUT | 09/25/17 |

## FILE LOG

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| Manager | ETT |
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109993
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PROFESSIONAL ENGINEER

Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

0 50 100
SCALE :1" = 50'

Project No. 120-10849-016
Date: April 21, 2016

OVERALL PILE PLAN AND FRONT ELEVATION

S 102
87 OF 148

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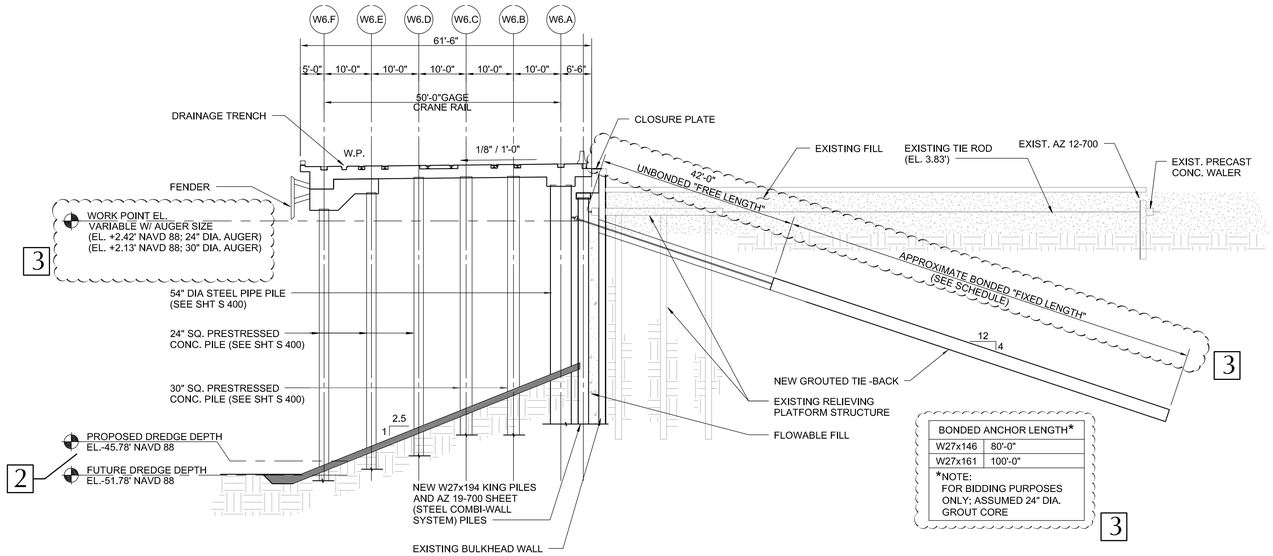
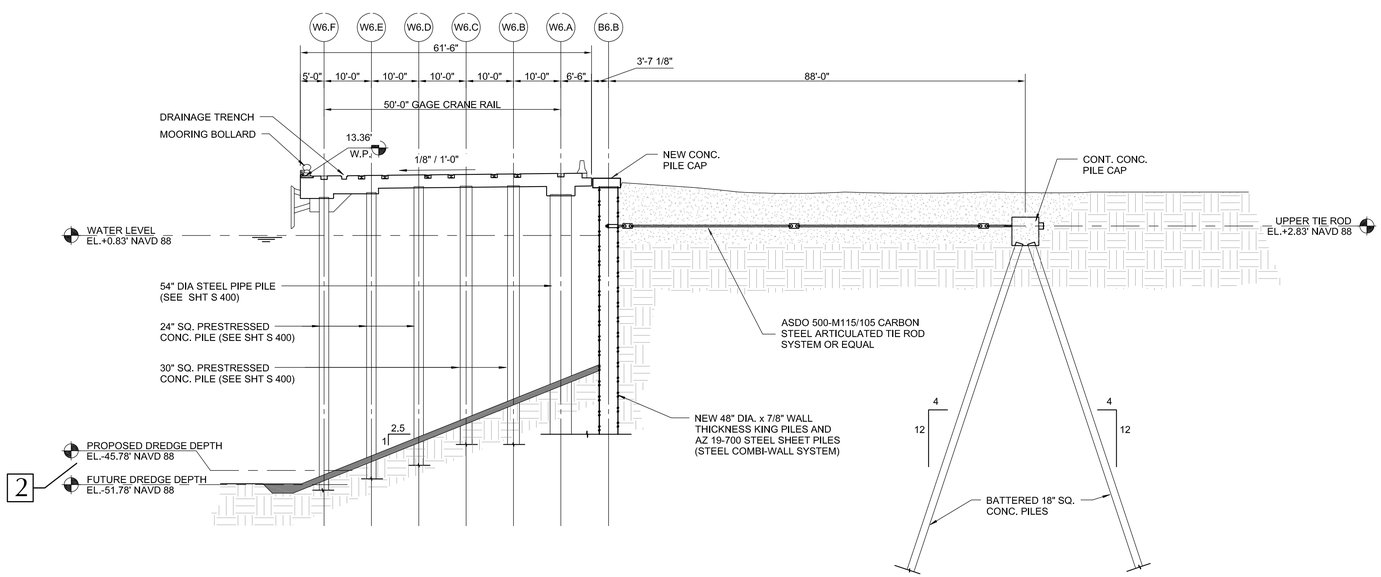



## 1 TYPICAL SECTION AT EXISTING BULKHEAD

SCALE: 1/16" = 1'-0"




## 2 TYPICAL SECTION AT NEW BULKHEAD

SCALE: 1/16" = 1'-0"

## NOTES

1. MINIMUM INDIVIDUAL HORIZONTAL ANCHOR FORCE FOR SINGLE LEVEL OF ANCHORS = 38.5 K/FT
2. REFER TO SPECIFICATION 31 51 00.00 FOR INFORMATION ON THE REQUIREMENTS OF THE GROUTED ANCHOR TIEBACKS.
3. SEE GENERAL REQUIREMENTS ON SHEET S 001 (REFERENCE NOTE 12) FOR CONTRACTOR'S RESPONSIBILITIES WITH RESPECT TO THE GROUTED TIEBACKS
4. THE TIE ROD CONNECTORS SHALL BE ENCASED IN CORROSION INHIBITING GREASE

2 PLANS MODIFIED TO DELINEATE REVISED DREDGING LIMITS
APRIL 7, 2017
TEXAS REGISTERED ENGINEERING FIRM F-9791

1 PLANS MODIFIED TO DELINEATE BERTH 5 LIMITS OF WORK FOR SEPARATE BID AND PLAN MODIFICATIONS
APRIL 7, 2017
TEXAS REGISTERED ENGINEERING FIRM F-9791

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REVISIONS

| NO. | DESCRIPTION | DATE |
|---|---|---|
| 0 | ISSUE FOR CONSTRUCTION | 04/21/16 |
| 1 | ISSUE FOR SEPARATE BID | 04/07/17 |
| 2 | MODIFIED DREDGING LIMITS | 04/07/17 |
| 3 | GROUTED TIEBACK MODS | 11/07/17 |

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PROFESSIONAL ENGINEER

Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

0 8' 16' 32'
SCALE : 1/16" = 1'-0"

Project No. 120-10849-016
Date: April 21, 2016

TYPICAL SECTIONS AT EXISTING BULKHEAD AND NEW BULKHEAD

S 150
88 OF 148

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## BULKHEAD IMPROVEMENTS PILE SCHEDULE

| Pile Designation | Pile Size | Material Type | True Batter | Pile Tip Elev (ft) | Pile Cut-off Elev (ft) | Comments | Working Load (Kips) | Estimated Pile Length (ft) | Number Ea. |
|---|---|---|---|---|---|---|---|---|---|
| GRID B6.A | W27X146 | Steel ASTM A992 | Plumb | -93.00 | +6.83 | | 13 | 100 | 70 |
| GRID B6.A | W27X161 | Steel ASTM A992 | Plumb | -93.00 | +6.83 | See Note | 16 | 100 | 18 |

3 W27x161 @ Grids B6.2, B6.9 thru B6.12, B6.19 thru B6.22, B6.29 thru B6.32, and B6.39 thru B6.43

## ANCHOR SYSTEM PILE SCHEDULE

| Pile Designation | Pile Size | Material Type | True Batter | Pile Tip Elev (ft) | Pile Cut-off Elev (ft) | Comments | Working Load (Kips) | Estimated Pile Length (ft) | Number Ea. |
|---|---|---|---|---|---|---|---|---|---|
| GRID B6.M | 18 x 18 | P/S P/C Concrete | 3V:1H | -89.92 | -6.81 | Compression Pile | 253 | 88 | 2 |
| GRID B6.M | 18 x 18 | P/S P/C Concrete | 3V:1H | -95.91 | -6.81 | Compression Pile | 253 | 94 | 4 |
| GRID B6.M | 18 x 18 | P/S P/C Concrete | 3V:1H | -89.92 | -0.81 | Compression Pile | 253 | 94 | 86 |
| GRID B6.N | 18 x 18 | P/S P/C Concrete | 3V:1H | -89.92 | -6.81 | Tension Pile | 192 | 88 | 2 |
| GRID B6.N | 18 x 18 | P/S P/C Concrete | 3V:1H | -95.91 | -6.81 | Tension Pile | 192 | 94 | 4 |
| GRID B6.N | 18 x 18 | P/S P/C Concrete | 3V:1H | -89.92 | -0.81 | Tension Pile | 192 | 94 | 86 |

## NEW BULKHEAD PILE SCHEDULE

| Pile Designation | Pile Size | Material Type | True Batter | Pile Tip Elev (ft) | Pile Cut-off Elev (ft) | Comments | Working Load (Kips) | Estimated Pile Length (ft) | Number Ea. |
|---|---|---|---|---|---|---|---|---|---|
| GRID B6.B | 48" OD x 7/8" | Steel ASTM A572 | Plumb | -90.00 | +11.16 | | 158 | 101 | 47 |
| GRID B6.C | 48" OD x 7/8" | Steel ASTM A572 | Plumb | -90.00 | +9.25 | | 158 | 99 | 1 |
| GRID B6.D | 48" OD x 7/8" | Steel ASTM A572 | Plumb | -90.00 | +9.25 | | 158 | 99 | 1 |
| GRID B6.E | 48" OD x 7/8" | Steel ASTM A572 | Plumb | -75.00 | +9.25 | | 158 | 84 | 1 |
| GRID B6.F | 48" OD x 7/8" | Steel ASTM A572 | Plumb | -75.00 | +9.25 | | 158 | 84 | 1 |
| GRID B6.G | 48" OD x 7/8" | Steel ASTM A572 | Plumb | -75.00 | +9.25 | | 158 | 84 | 1 |
| --- | 24" OD x 1/2" | Steel ASTM A572 | Plumb | -55.00 | +6.83 | | 9 | 62 | 1 |
| GRID B6.H | 48" OD x 7/8" | Steel ASTM A572 | Plumb | -50.00 | +9.25 | | 158 | 59 | 1 |
| GRID B6.I | 36" OD x 5/8" | Steel ASTM A572 | Plumb | -50.00 | +9.25 | | 108 | 59 | 1 |
| GRID B6.J | 36" OD x 5/8" | Steel ASTM A572 | Plumb | -50.00 | +9.25 | | 108 | 59 | 1 |
| GRID B6.K | 36" OD x 5/8" | Steel ASTM A572 | Plumb | -45.00 | +9.25 | | 108 | 54 | 1 |
| GRID B6.L | 36" OD x 5/8" | Steel ASTM A572 | Plumb | -45.00 | +9.25 | | 108 | 54 | 1 |

## WHARF PILE SCHEDULE

| Pile Designation | Pile Size | Material Type | True Batter | Pile Tip Elev (ft) | Pile Cut-off Elev (ft) | Comments | Working Load (Kips) | Estimated Pile Length (ft) | Number Ea. |
|---|---|---|---|---|---|---|---|---|---|
| GRID W6.B | 30 x 30 | P/S P/C Concrete | Plumb | -88.00 | +7.27 | At W6.45 and W6.46 | 267 | 95 | 2 |
| GRID W6.B | 30 x 30 | P/S P/C Concrete | Plumb | -88.00 | +11.35 | | 267 | 99 | 44 |
| GRID W6.A | 54"OD x 5/8" | Steel ASTM A572 | Plumb | -93.00 | +7.27 | At W6.45 and W6.46 | 486 | 100 | 2 |
| GRID W6.A | 54"OD x 5/8" | Steel ASTM A572 | Plumb | -93.00 | +9.47 | | 486 | 102 | 44 |
| GRID W6.C | 30 x 30 | P/S P/C Concrete | Plumb | -100.00 | +7.27 | At W6.45 and W6.46 | 313 | 107 | 2 |
| GRID W6.C | 30 x 30 | P/S P/C Concrete | Plumb | -100.00 | +11.25 | | 313 | 111 | 44 |
| GRID W6.E | 24 x 24 | P/S P/C Concrete | Plumb | -110.00 | +7.90 | | 301 | 118 | 16 |
| GRID W6.E | 24 x 24 | P/S P/C Concrete | Plumb | -110.00 | +9.89 | At Bollard | 301 | 120 | 11 |
| GRID W6.E | 24 x 24 | P/S P/C Concrete | Plumb | -110.00 | +11.04 | Other Than at Fender Location | 301 | 121 | 19 |
| GRID W6.D | 24 x 24 | P/S P/C Concrete | Plumb | -110.00 | +11.14 | | 309 | 121 | 46 |
| GRID W6.F | 24 x 24 | P/S P/C Concrete | Plumb | -116.00 | +4.40 | At Primary Fender | 328 | 120 | 16 |
| GRID W6.F | 24 x 24 | P/S P/C Concrete | Plumb | -116.00 | +6.06 | At Secondary Fender | 328 | 122 | 14 |
| GRID W6.F | 24 x 24 | P/S P/C Concrete | Plumb | -116.00 | +8.89 | Other Than at Fender Location | 328 | 125 | 56 |

2

2 PLANS MODIFIED TO REMOVE MOORINGS
APRIL 7, 2017
TEXAS REGISTERED ENGINEERING FIRM F-9791

1 PLANS MODIFIED TO DELINEATE BERTH 5 LIMITS OF WORK FOR SEPARATE BID AND PLAN MODIFICATIONS
APRIL 7, 2017
TEXAS REGISTERED ENGINEERING FIRM F-9791

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Collins Engineers, Inc.
Texas Registered Engineering Firm F-9791

REVISIONS

| NO. | DESCRIPTION | DATE |
|---|---|---|
| 0 | ISSUE FOR CONSTRUCTION | 04/21/16 |
| 1 | ISSUE FOR SEPARATE BID | 04/07/17 |
| 2 | REMOVED MOORINGS | 04/07/17 |
| 3 | BULKHEAD IMPROVEMENTS PILE SCHEDULE REVISIONS | 08/25/17 |

FILE LOG

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| Manager | ETT |
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Project No. 120-10849-016
Date: April 21, 2016

PILE SCHEDULE

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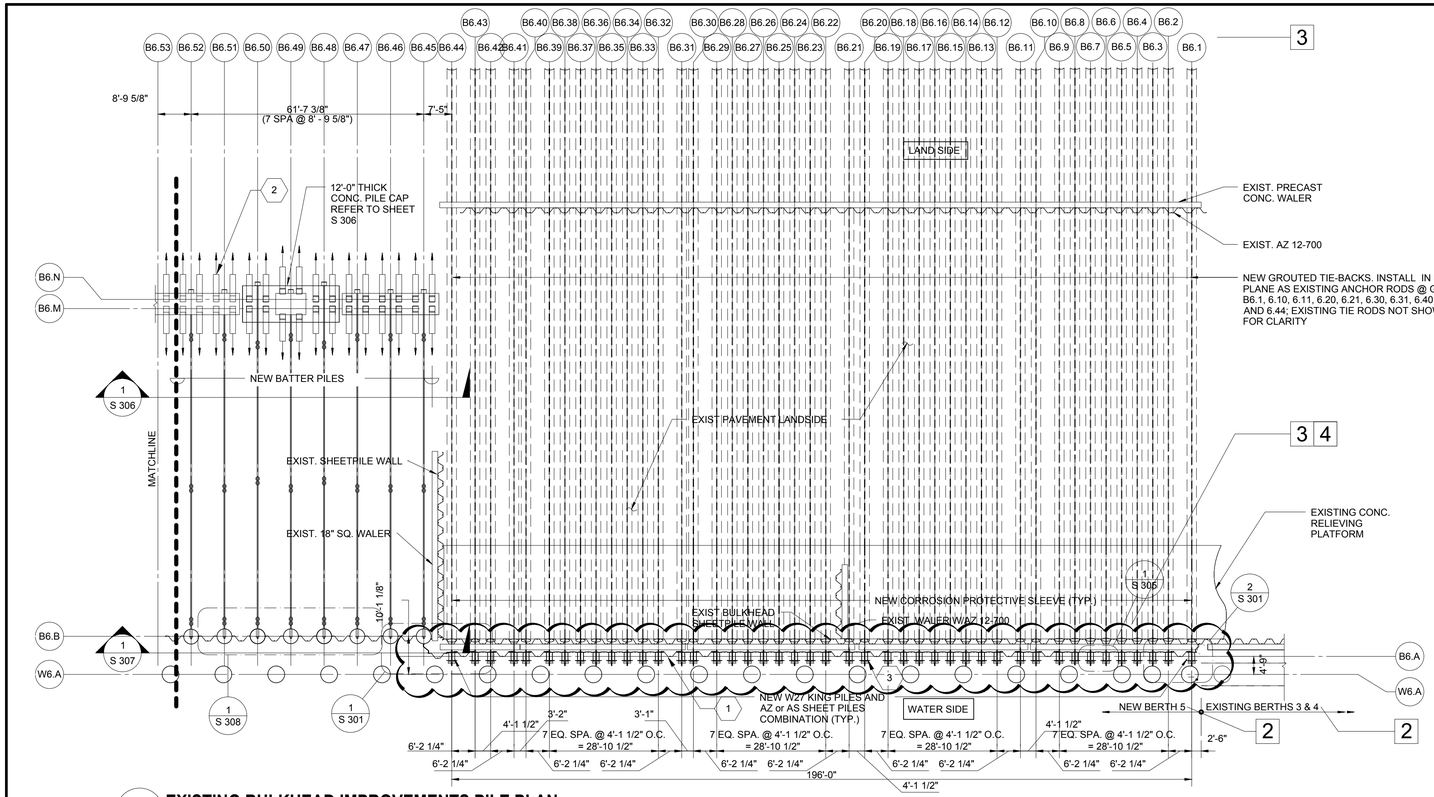
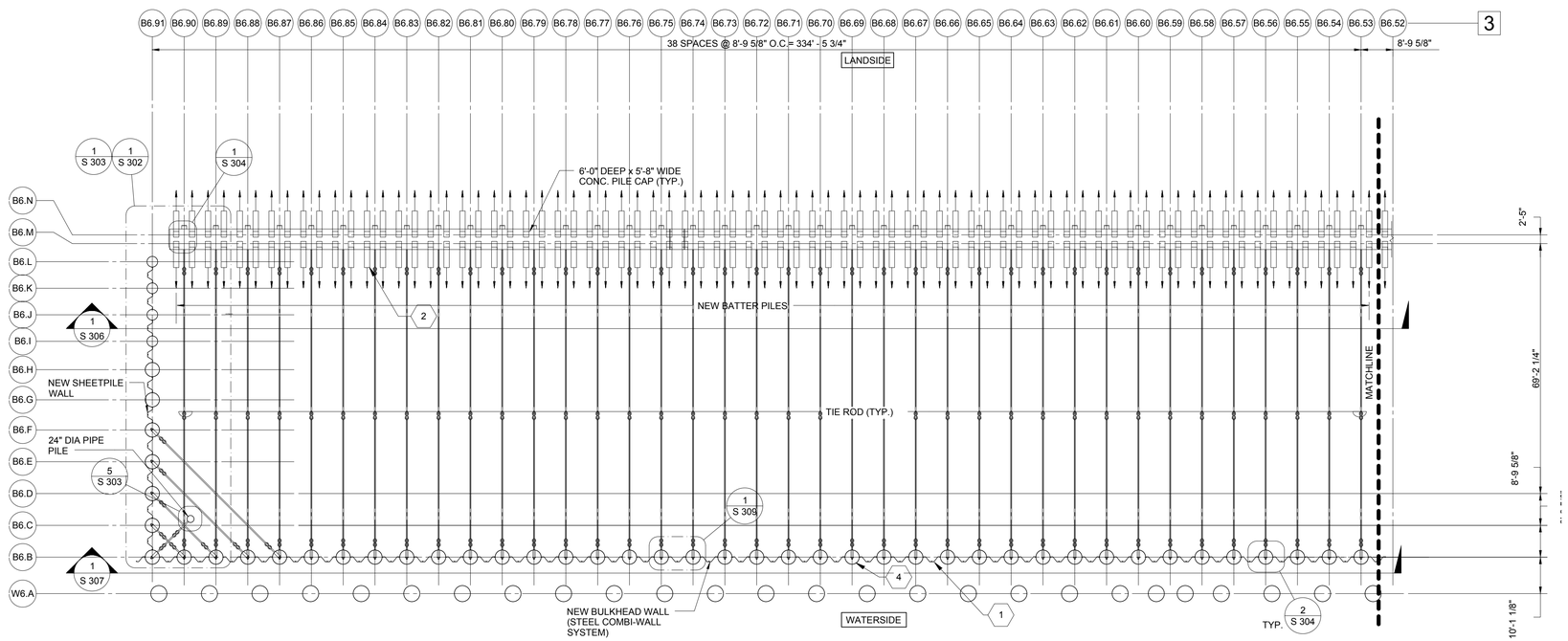



## 1 EXISTING BULKHEAD IMPROVEMENTS PILE PLAN

SCALE: 1" = 20'-0"




## 2 NEW BULKHEAD PILE PLAN

SCALE: 1" = 20'-0"

## KEYED NOTES

1. ALL COMBI-WALL SHEET PILING SHALL BE AZ 19-700 or AS 500 x 12.7; AS SHOWN
2. 18" SQ. P/S CONCRETE TEST PILE
3. W27 STEEL TEST PILE
4. 48" OD STEEL PIPE TEST PILE

2 PLANS MODIFIED TO DELINEATE BERTH LIMITS
APRIL 7, 2017
TEXAS REGISTERED ENGINEERING FIRM F-9791

1 PLANS MODIFIED TO DELINEATE BERTH 5 LIMITS OF WORK FOR SEPARATE BID AND PLAN MODIFICATIONS
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## REVISIONS

| NO. | DESCRIPTION | DATE |
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| 1 | ISSUE FOR SEPARATE BID | 04/07/17 |
| 2 | DELINEATE BERTH LIMITS | 04/07/17 |
| 3 | MODIFIED COMBINATION WALL LAYOUT | 08/25/17 |
| 4 | MODIFIED COMBINATION WALL LAYOUT | 09/25/17 |

## FILE LOG

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0 20 40
SCALE :1" = 20'

Project No. 120-10849-016
Date: April 21, 2016

BULKHEAD SYSTEM PLAN

S 300
93 OF 148

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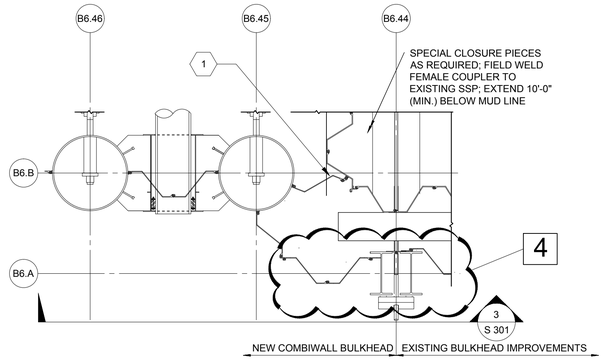
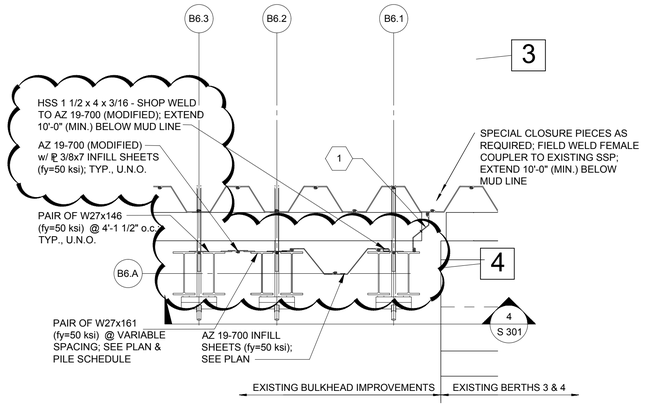


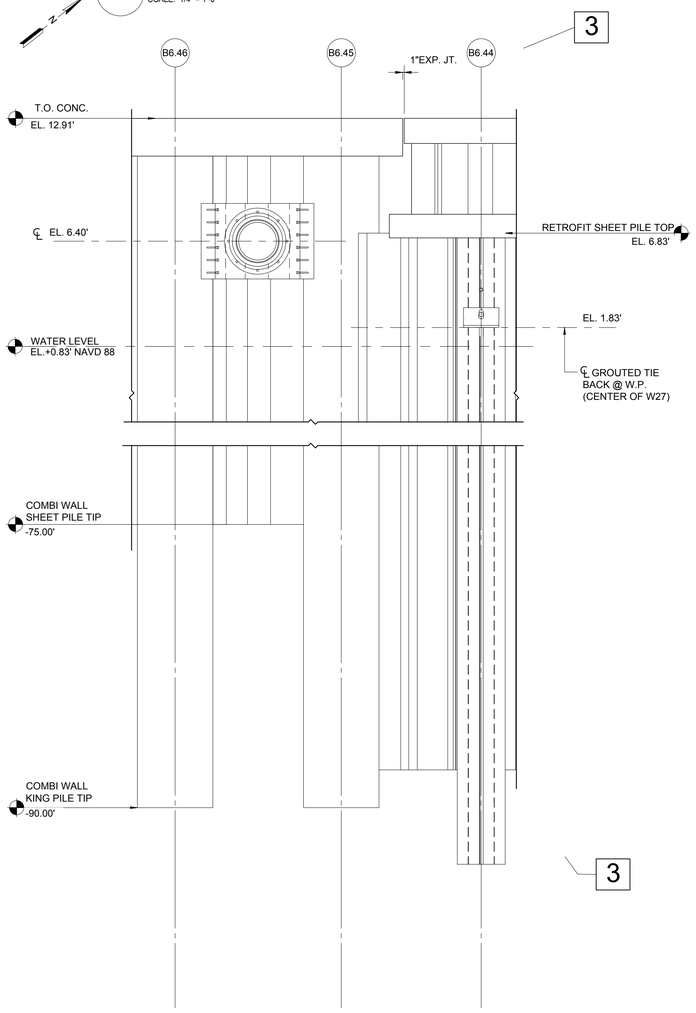

## 1 PARTIAL PLAN OF PILE CLOSURE AT NEW AND EXISTING BULKHEAD IMPROVEMENTS INTERFACE

SCALE: 1/4" = 1'-0"



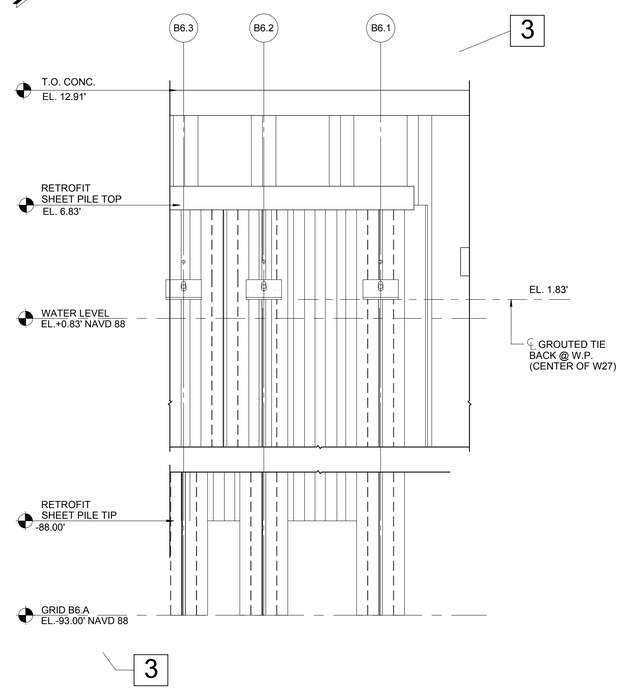

## 2 PARTIAL PLAN OF EXISTING BULKHEAD IMPROVEMENTS AND PILE CLOSURE AT BERTH 4

SCALE: 1/4" = 1'-0"




## 3 NEW COMBIWALL CLOSURE TO EXISTING BULKHEAD

SCALE: 1/4" = 1'-0"




## 4 EXISTING BULKHEAD RETROFIT TO EXISTING BULKHEAD CLOSURE

SCALE: 1/4" = 1'-0"

## KEYED NOTES

1. CONTRACTOR TO REMOVE EXISTING BULKHEAD WALL CAP AS REQUIRED TO ACCOMMODATE INSTALLATION OF SSP CLOSURE TO EXISTING SSP WALL. RESTORE CONCRETE CAP IN KIND.TRIM BUT DO NOT REMOVE EXISTING PRECAST CONCRETE WALERS AS REQUIRED TO ACCOMMODATE NEW SSP CLOSURE.

2

| | |
|---|---|
| 2 | PLANS MODIFIED TO DELINEATE BERTH LIMITS<br>APRIL 7, 2017<br>TEXAS REGISTERED ENGINEERING FIRM F-9791 |
| 1 | PLANS MODIFIED TO DELINEATE BERTH 5 LIMITS OF WORK FOR SEPARATE BID AND PLAN MODIFICATIONS<br>APRIL 7, 2017<br>TEXAS REGISTERED ENGINEERING FIRM F-9791 |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## REVISIONS

| NO. | DESCRIPTION | DATE |
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| 1 | ISSUE FOR SEPARATE BID | 04/07/17 |
| 2 | DELINEATE BERTH LIMITS | 04/07/17 |
| 3 | MODIFIED COMBINATION WALL LAYOUT | 08/25/17 |
| 4 | MODIFIED COMBINATION WALL LAYOUT | 09/25/17 |

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09/25/17

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Texas Registered Engineering Firm F-2614

0 2' 4' 8'
SCALE : 1/4" = 1'-0"

Project No. 120-10849-016
Date: April 21, 2016

BULKHEAD CLOSURE STRUCTURES

S 301
94 OF 148

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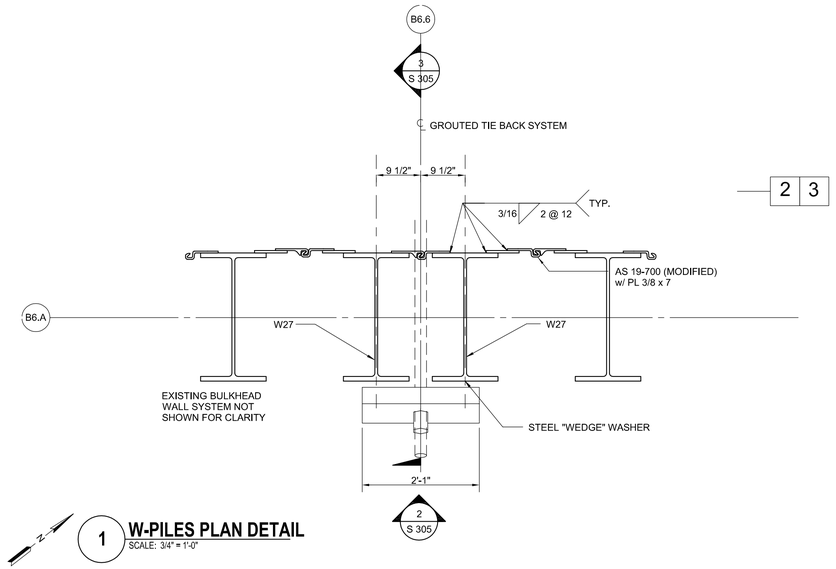
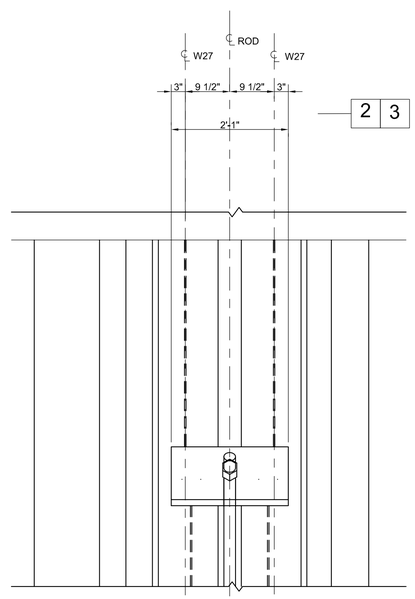
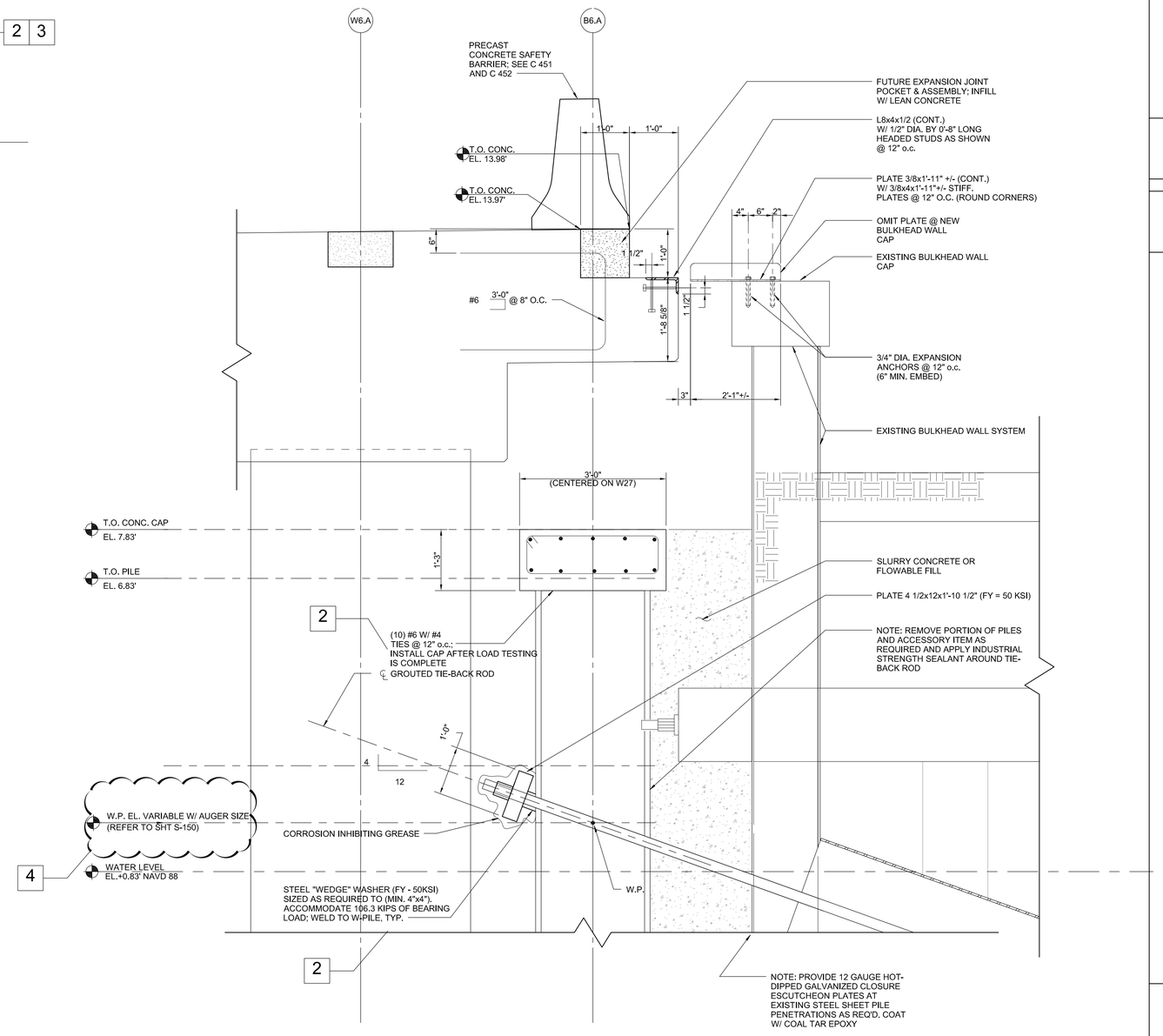



1 **W-PILES PLAN DETAIL**
SCALE: 3/4" = 1'-0"




2 **W-PILES SECTION DETAIL**
SCALE: 3/4" = 1'-0"




3 **ANCHORED TIE BACK DETAIL**
SCALE: 3/4" = 1'-0"

1 PLANS MODIFIED TO DELINEATE BERTH 5
LIMITS OF WORK FOR SEPARATE BID AND PLAN
MODIFICATIONS
APRIL 7, 2017
TEXAS REGISTERED ENGINEERING FIRM F-9791

Berth 5 Construction 1

PORT ARTHUR INTERNATIONAL PUBLIC PORT

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|---|---|---|
| 0 | ISSUE FOR CONSTRUCTION | 04/21/16 |
| 1 | ISSUE FOR SEPARATE BID | 04/07/17 |
| 2 | MODIFIED COMBINATION WALL LAYOUT | 08/25/17 |
| 3 | MODIFIED COMBINATION WALL LAYOUT | 09/25/17 |
| 4 | GROUTED TIE-BACK MODIFICATIONS | 11/07/17 |

FILE LOG

| | |
|---|---|
| Manager | ETT |
| Design | PRJ |
| Draw | ACB |
| Check | JDJ |

STAMP

STATE OF TEXAS
PERCY R. JAMES
109993
LICENSED
PROFESSIONAL ENGINEER
11/07/17

Lockwood, Andrews & Newnam, Inc.
Texas Registered Engineering Firm F-2614

0 1' 2' 3'
SCALE : 3/4" = 1'-0"

Project No. 120-10849-016
Date: April 21, 2016

BULKHEAD AND ANCHOR WALL SECTIONS AND DETAILS (SHEET 3 OF 7)

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