

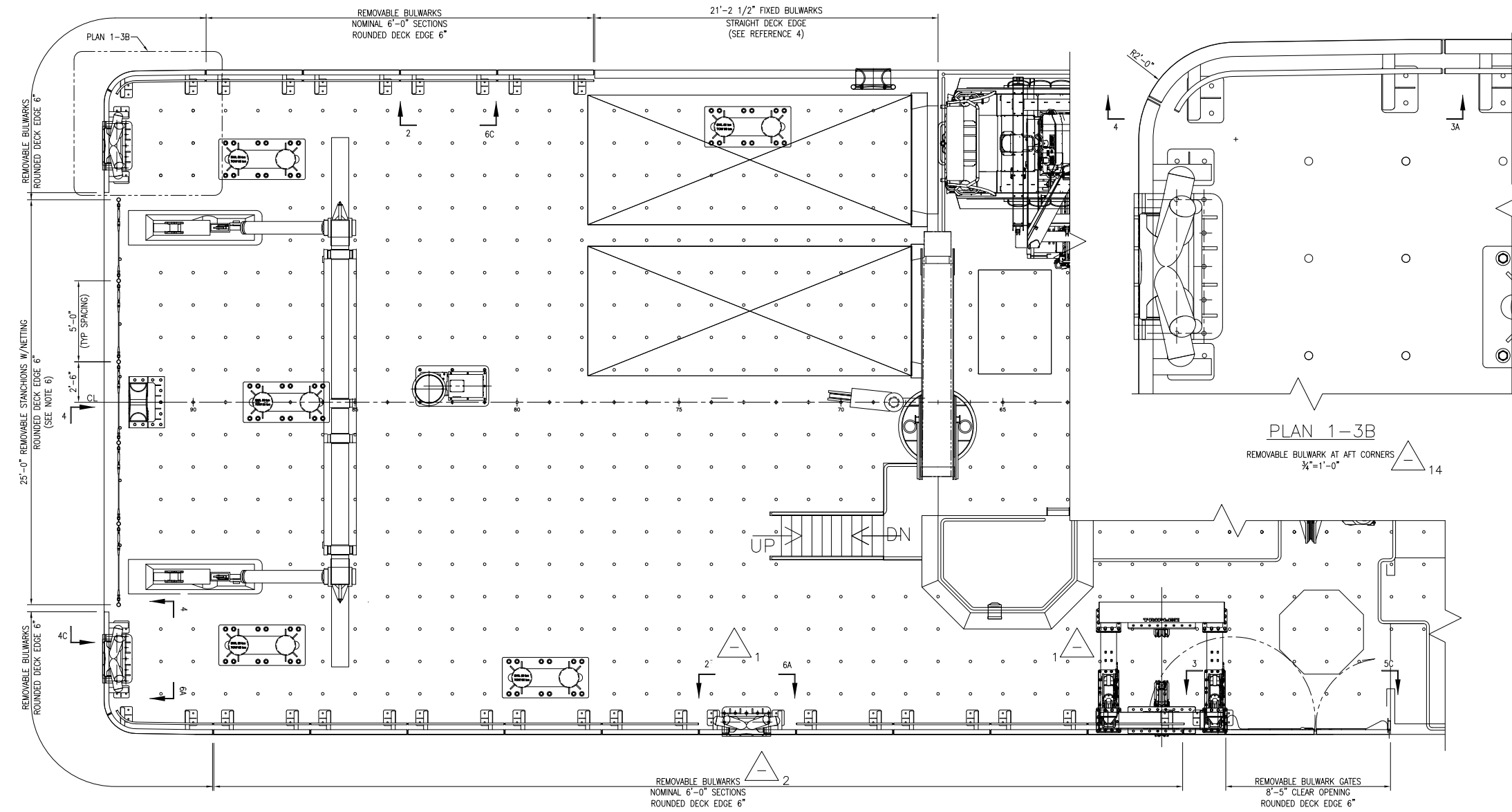
GENERAL NOTES

1. ALL MATERIALS, SCANTLINGS, WELDING AND WELD PROCEDURES SHALL COMPLY WITH ABS RULES FOR BUILDING AND CLASSING STEEL VESSELS UNDER 90 METERS IN LENGTH, 2017.
2. VESSEL IS TO BE CLASSED ABS ICE CLASS CO MINIMUM DESIGN TEMPERATURE IS -4 F.
3. ALL MATERIALS SHALL BE ABS GRADE A STEEL UNLESS NOTED OTHERWISE.
4. CHOCK IS SHOWN FOR REFERENCE ONLY. FOR CHOCK SPECIFICATIONS AND DIMENSIONS, SEE REFERENCE 6.
5. ALL OHS EQUIPMENT IS PRELIMINARY AND SHOWN FOR ILLUSTRATIVE PURPOSES.
6. NETTING CONSTRUCTED OF UV, ROT, ABRASION AND SHOCK RESISTANT, 2" WIDE WEBBING.

RESERVATIONS

1. CHOCK LOCATIONS SUBJECT TO CHANGE BASED ON VFI DISCUSSION.
2. AWAITING DECK SOCKET DETAIL FROM VENDOR.
3. GLEAT SIZE UNDER DISCUSSION.
4. BULWARK GATE DESIGN RESERVED PENDING HYDRAULIC REQUIREMENTS.

REVISIONS						
REV	SH	ZONE	ITEM	DESCRIPTION	DATE	APPVL SIG & ORG
0	ALL	-	-	INITIAL ISSUE		
	ALL	-	-	THIS DOCUMENT UPDATES THE CONTRACT DRAWING REMOVABLE BULWARKS, REFERENCE 5, WITH THE SHIPYARD'S TITLE BLOCK, DRAWING NUMBER AND REVISION CONVENTION. THE DRAWING WAS INITIALLY SEALED BY STEPHEN D. WHITE, PE LICENSE NO. 41019, STATE OF WASHINGTON, SIGNED ON 7/19/16.		
				THE PE STAMP ON THIS ISSUE OF THE DRAWING ONLY PERTAINS TO THE FOLLOWING CHANGES MADE:		
1	1-5D	1		GENERAL NOTE NO. 1 WAS UPDATED TO REFERENCE THE 2017 EDITION IN LIEU OF THE 2015 EDITION OF THE ABS RULES FOR BUILDING AND CLASSING STEEL VESSELS UNDER 90 METERS IN LENGTH.		
1	1-5D	2		GENERAL NOTE NO. 4 ADDED.		
1	1-5A	3		MOVED ELEVATION CALLOUT "2-5C (TYP)" TO CORRECT LOCATION.		
2	2-1B	4		SECTION 2-1B WAS PREVIOUSLY 2-5A ON THE REFERENCE 5 DRAWING.		
3	3-2A	5		REMOVED ELEVATION 3-2A AND ELEVATION 3-2C FROM REFERENCE 5 DRAWING.		
3	3-5C	6		ELEVATION 3-5C WAS UPDATED TO INCLUDE HORNS AND BASEPLATE OF CHOCK.		
3	3-7B	7		ADDED DETAIL 3-7B.	11/09/17	KDP / CET



NO.	TITLE	DRAWING NUMBER
8	OVERBOARD HANDLING SYSTEM	6096-710-001
7	BROW DESIGN & STOWAGE	6096-616-002
6	MOORING ARRANGEMENT	6096-580-001
5	REMOVABLE BULWARKS	12100-160-01
4	STEEL HULL STRUCTURAL ARRANGEMENT	6096-100-001
3	PLANES PLAN	6096-070-002
2	GENERAL ARRANGEMENT	6096-070-001
1	SHIP SPECIFICATION	12100-000

REFERENCE PLANS
SPECIAL NOTATIONS

DRAWING CONFIDENTIALITY STATEMENT
THIS DRAWING IS TO BE USED FOR CONSTRUCTION OF THE REGIONAL CLASS RESEARCH VESSELS. USE AND/OR REPRODUCTION OF THIS DRAWING AND FURTHER DISSEMINATION IS AUTHORIZED ONLY AS DIRECTED BY GULF ISLAND SHIPYARDS OR OREGON STATE UNIVERSITY.

GULF ISLAND SHIPYARDS
301 GULF ISLAND ROAD
HOUMA, LA 70363
PHONE: (985) 872-2305
CONTRACT/PO NO.
184162

OREGON STATE UNIVERSITY
CORVALLIS, OR 97331

199'-6" REGIONAL CLASS RESEARCH VESSEL
REMOVABLE BULWARKS
KEY PLAN VIEW

PROFESSIONAL ENGINEER STAMP
THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY KEVIN PRINCE, LICENSE NO. 19789, LICENSE STATE, VIRGINIA, ON 11/9/17. THIS MEDIUM SHALL NOT BE CONSIDERED A CERTIFIED DOCUMENT.

DRAWN: K. BURKE 01/17/18
CHECKED: A. PORTER 01/17/18
APPROVED: D. NOSEWORTHY 01/17/18

genoa DESIGN INTERNATIONAL

SIZE	FSCM CAGE NO.	DRAWING NO.	REV
D	7UTH5	6096-160-001	-


SCALE: AS SHOWN SHEET 1 OF 6

REVISIONS CONTINUED

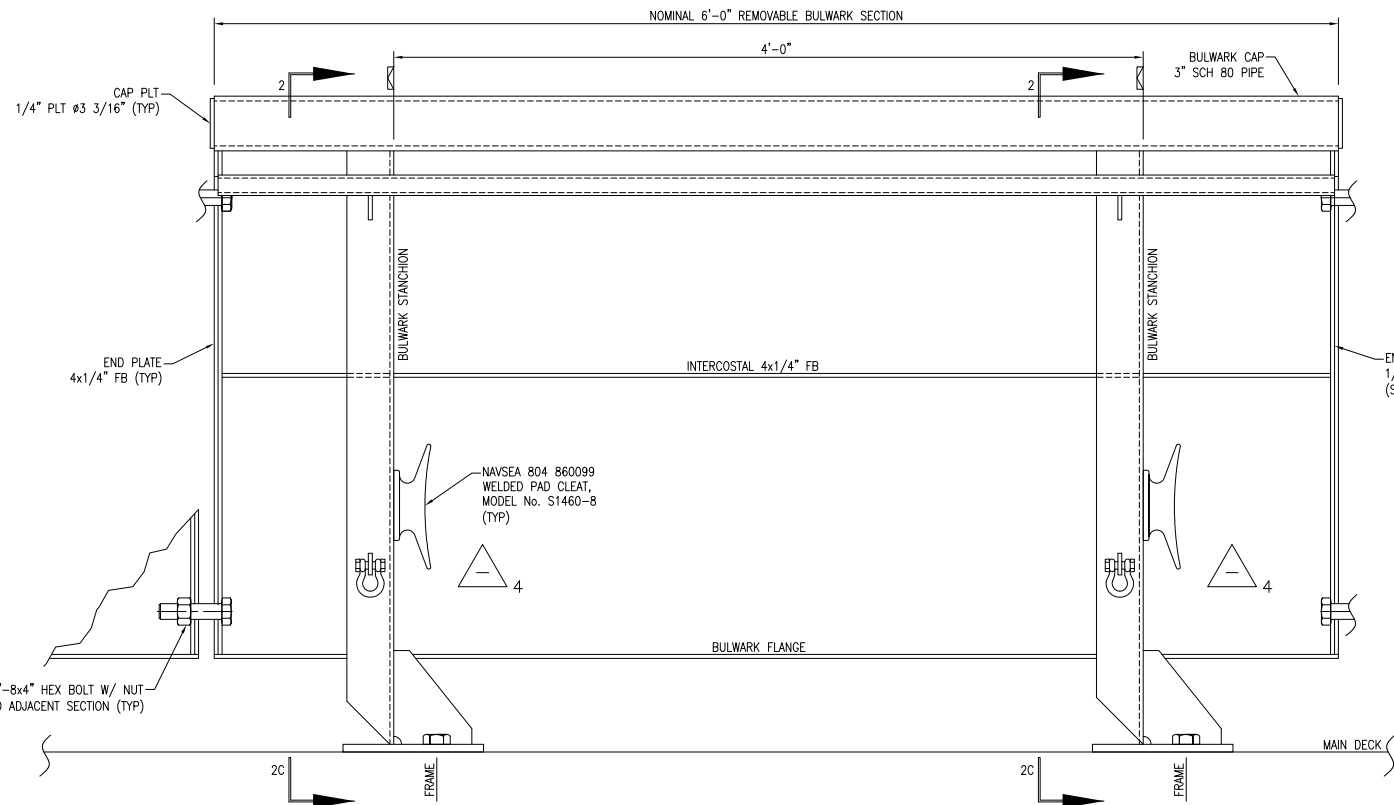
REV	SH	ZONE	ITEM	DESCRIPTION	DATE	APPVL SIG & ORG
P2	1	1-7C	8	REMOVABLE BULWARKS ADJUSTED TO NOMINAL 6'-0" SECTIONS	01/17/18	KB/AP GDI
	1	1-4A	9	GATE ADJUSTED TO 9'-7" CLEAR OPENING		
	1	1-8B	10	LIFE LINE STANCHIONS ADJUSTED		
	1	1-5C	11	FIXED BULWARK LENGTH ADJUSTED		
	2	2-5B	12	REMOVABLE CHOCK REPLACED WITH PROVIDED VFI		
	1	1-5D	13	GENERAL NOTE NO. 5 ADDED		
	1	1-5D	14	GENERAL NOTE NO. 6 ADDED		
	1	1-2A	15	TITLE BLOCK UPDATED TO REFLECT GENOA DESIGN LOGO		
	1	1-4D	16	ADDED RESRVATION SECTION		
	4	-	17	SHEET 4 ADDED		
	2	2-5A	17	DELETED PLAN 2-5A		
	3	3-5C	18	MOVED ELEVATION 3-5C TO SHT 2 AND RENAMED TO 2-5B		
	3	3-7B	19	MOVED DETAIL 3-7B TO SHT 2 AND RENAMED TO DETAIL 2-8B		
	2&3	-	20	ADDED SECTIONS/DETAILS 2-3A, 2-3B, 3-1B, 3-1C, 3-2C, 3-2A, 3-2B, 3-3A, 3-4A, 3-6A, 3-7A, 3-5B, 3-6C		
	2	2-2C	21	RENAMED SECTION 2-1B TO 2-2C		
	3	3-4B	22	ADDED DETAIL 3-4B		
P3	1	ALL	1	UPDATED DECK EQUIPMENT PER MOST RECENT VFI		
	1	ALL	2	UPDATED BACKGROUND PER MOST RECENT GENERAL ARRANGEMENT		
	1	1-4A	3	REMOVED "ROUNDED DECK EDGE 6" FROM THE GATE DIMENSION		
	1	1-4D	4	DELETED RESERVATIONS 1, 2 & 3		
	1	1-2B	5	ADDED REFERENCES 7 & 8		
			6	ADDED DETAILS 2-1D, 2-4B, 4-1B, 4-3C, 4-4B & 4-6B		
	4	ALL	7	REMOVED GATE REST AND STANCHION SOCKET DETAILS		
	4	4-4C	8	UPDATED SECTION 4-4C TO INCLUDE NETTING AND ALTERED CABLE HEIGHTS		
	1	1-8B	9	ADJUSTED AFT STANCHION LOCATIONS		
	5	ALL	10	ADDED SHEET 5		
	4	ALL	11	REMOVED HINGE DETAILS TO SUIT HYDRAULICALLY ACTUATED GATES		
	2	2-5D	12	ADDED CLEATS TO SECTION 2-5D		
	1&5	1-6A, 5-5B	1	UPDATED LOCATION OF CRANES AS PER MOST RECENT GENERAL ARRANGEMENT	10/10/18	KB/AP GDI
	1	1-8B	2	UPDATED MOORING EQUIPMENT AS PER MOST RECENT MOORING ARRANGEMENT		
	1	1-5A	3	UPDATED KEY PLAN 1-5A IN ACCORDANCE WITH 6' LENGTHENING		
	2	2-2C	4	UPDATED BULWARK CLEAT FROM 10" TO 8" MODEL		
	3	3-5C	5	UPDATED EKEVATION 3-5C TO INCORPORATE NEW GATE LOCKING MECHANISM		
	3	3-1C	6	ADDED DETAIL 3-1C		
	3	3-5B	7	ADDED DETAIL 3-5B		
	3	3-4B	8	ADDED SECTION 3-4B		
	3	3-6A	9	ADDED SECTION 3-6A		
	3	3-7B	10	ADDED DETAIL 3-7B		
	5	5-2C	11	ADDED ELEVATION 5-2C		
	1A	ALL	12	TITLE BLOCK UPDATED TO REFLECT 6' LENGTHENING		
	2	2-4A	13	ALTERED DESIGN OF BULWARK STANCHION IN WAY OF CHOCK		
	1	1-3B	14	ADDED PLAN 1-3B		
	4	4-3A	15	ADDED SECTION 4-3A		
	3	3-3A	16	ADDED SECTION 3-3A		
	4	4-8B	17	RENAMED SECTION 4-1B TO 4-8B		
	4	4-8C	18	RENAMED SETAIL 4-3B TO 4-8C		
	4	4-1A	19	RENAMED DETAIL 4-4B TO 4-1A		
	6	-	20	SHEET 6 ADDED		
	3	3-1B	21	ADDED SECTION 3-1B		

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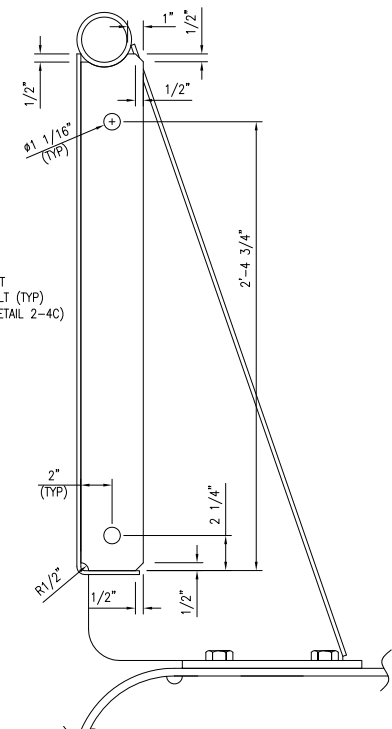
199'-6" REGIONAL CLASS RESEARCH VESSEL


 REMOVABLE BULWARKS
REVISION NOTES

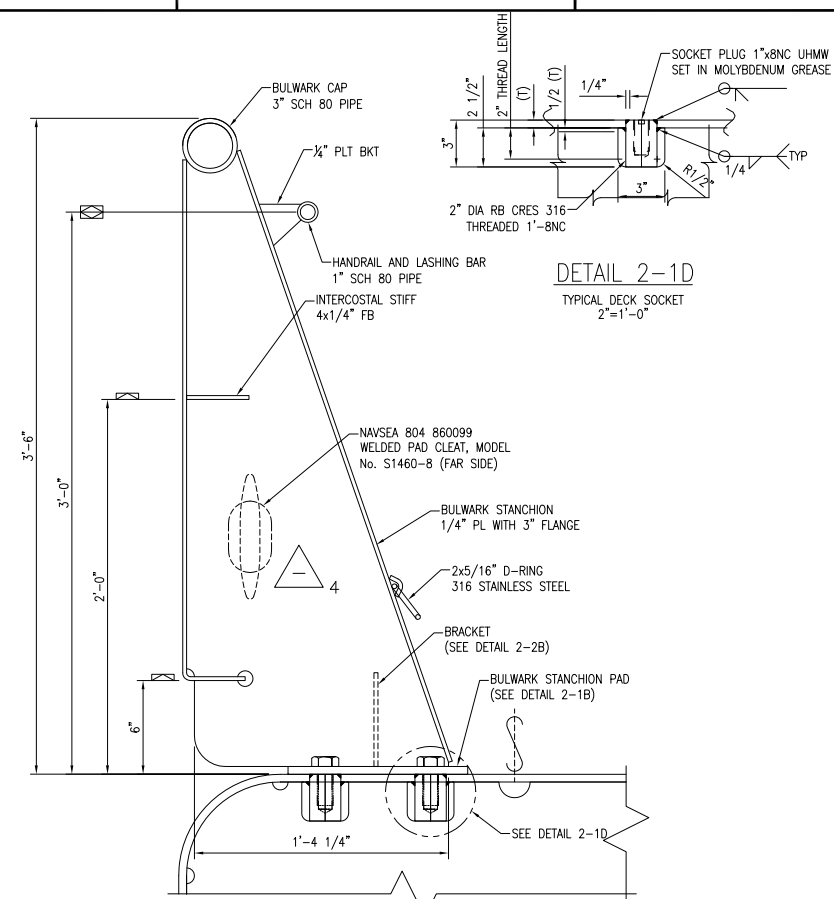
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D	7UTH5	6096-160-001	-
SCALE: AS SHOWN		SHEET 1A OF 6	



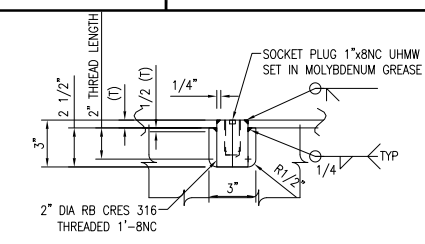
ELEVATION 2-6C
 REMOVABLE BULWARK
 NOMINAL 6' SECTION
 2'=1'-0"



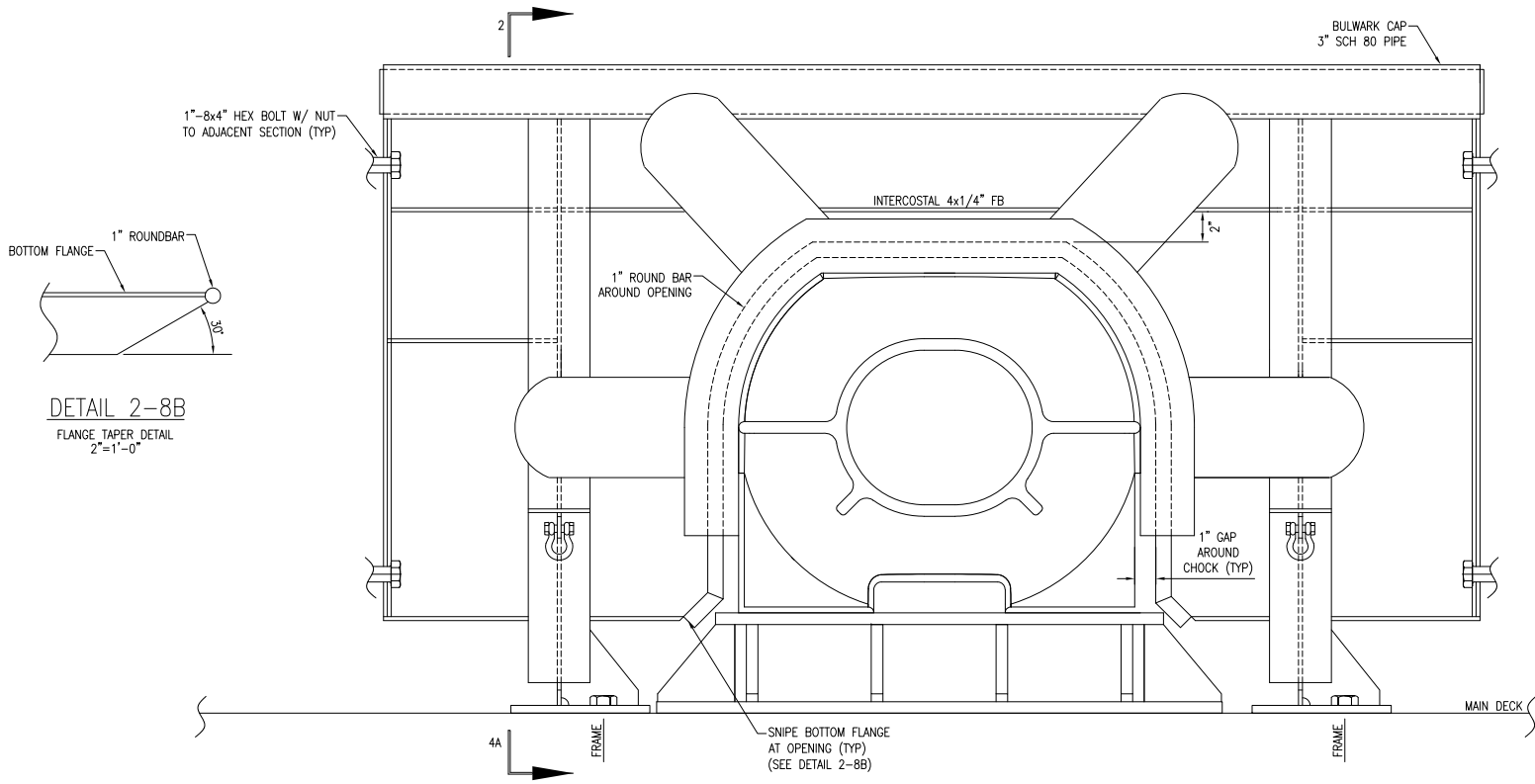
ELEVATION 2-4C
 TYPICAL END PLATE DETAIL
 2'=1'-0"



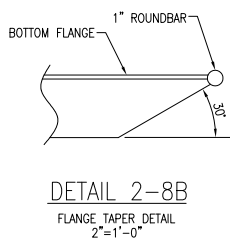
SECTION 2-2C
 BULWARK STANCHION
 LOOKING AFT
 2'=1'-0"



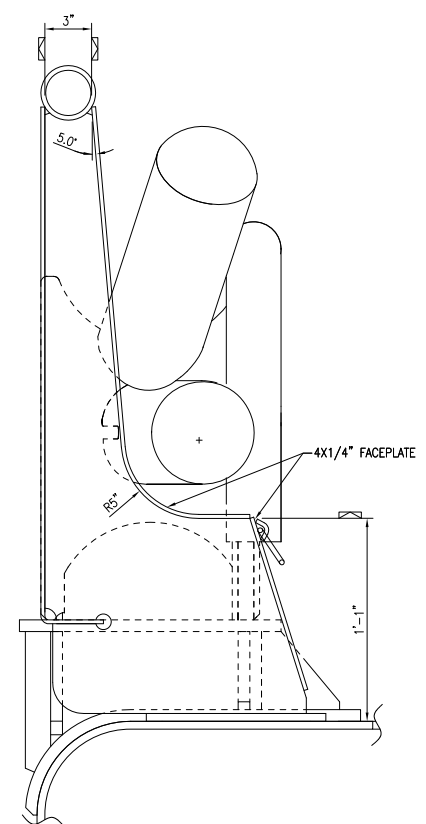
DETAIL 2-1D
 TYPICAL DECK SOCKET
 2'=1'-0"



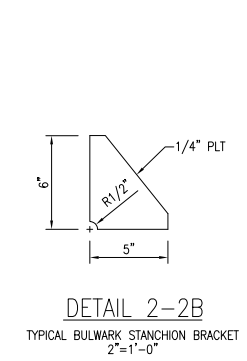
ELEVATION 2-6A
 REMOVABLE BULWARK IWO CHOCK
 2'=1'-0"



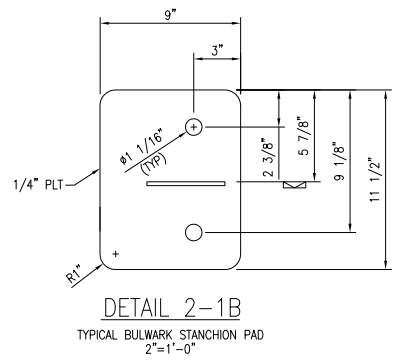
DETAIL 2-8B
 FLANGE TAPER DETAIL
 2'=1'-0"



SECTION 2-4A
 BULWARK STANCHION IWO OF CHOCK HORN
 2'=1'-0"



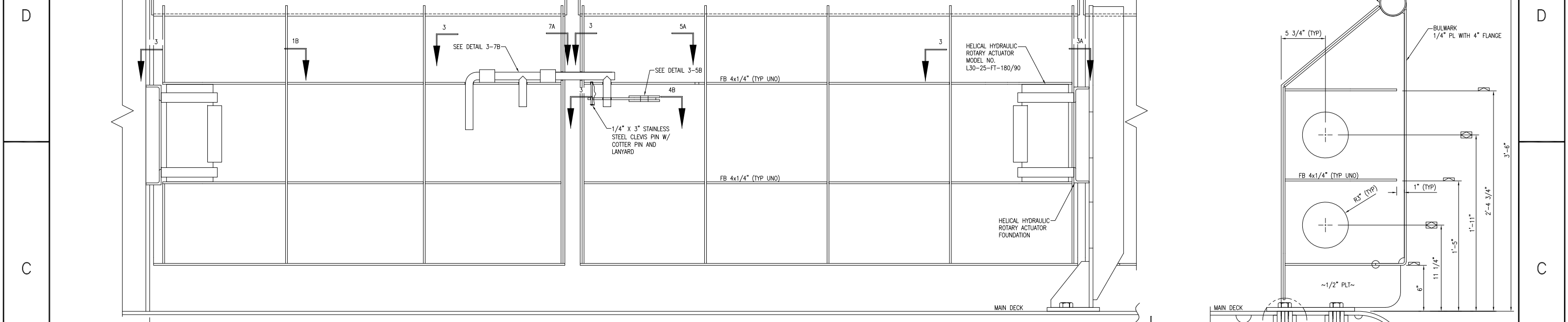
DETAIL 2-2B
 TYPICAL BULWARK STANCHION BRACKET
 2'=1'-0"



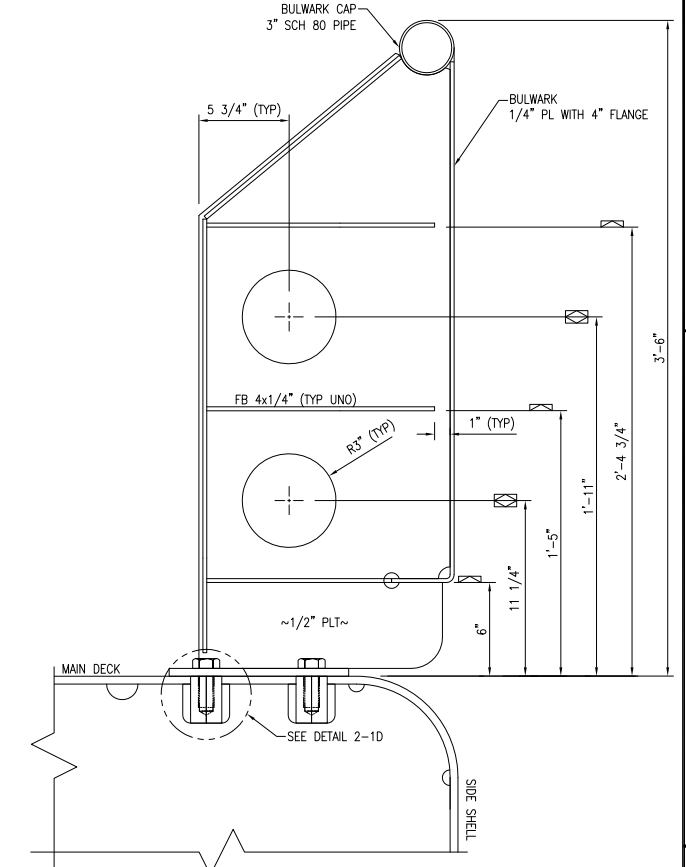
DETAIL 2-1B
 TYPICAL BULWARK STANCHION PAD
 2'=1'-0"

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199'-6" REGIONAL CLASS RESEARCH VESSEL			
12 REMOVABLE BULWARKS BULWARK SECTIONS & STANCHION DETAILS			
SIZE D	FSCM CAGE NO. 7UTH5	DRAWING NO. 6096-160-001	REV -
SCALE: AS SHOWN		SHEET 2 OF 6	

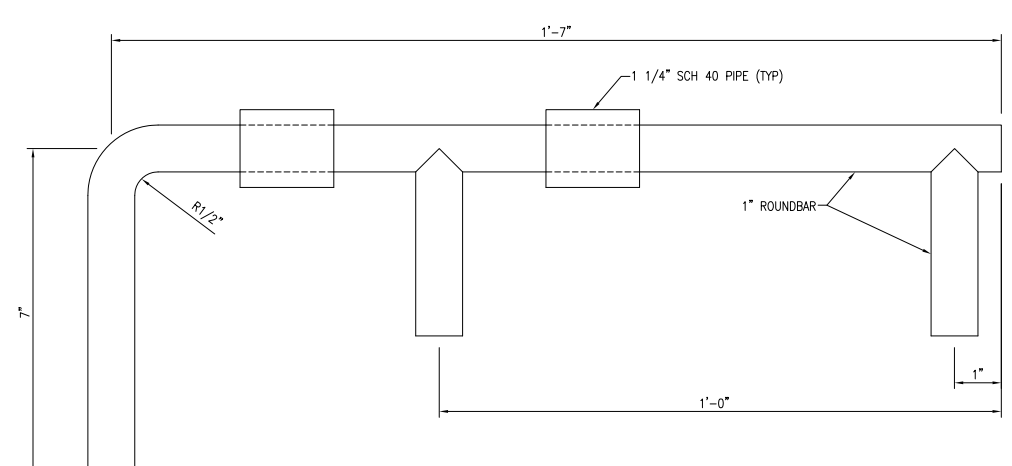
8 7 6 5 4 3 2 1



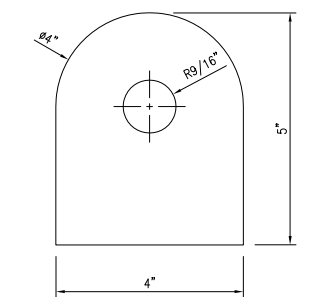
ELEVATION 3-5C
 REMOVABLE BULWARK GATES
 2'-1'-0"



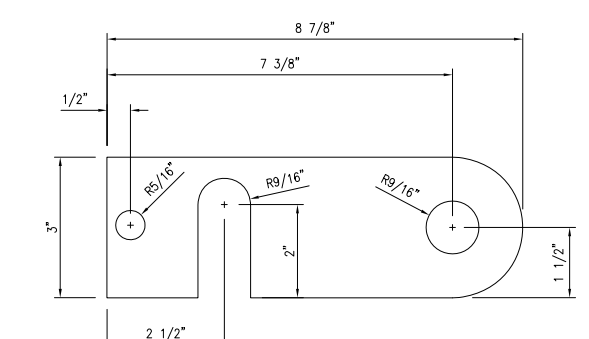
SECTION 3-1B
 STANCHION IN WAY OF
 GATE ACTUATOR
 2'-1'-0"



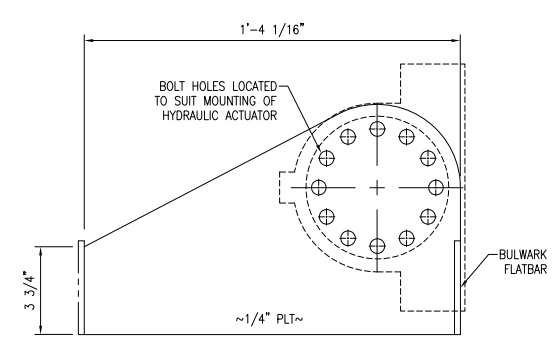
DETAIL 3-7B
 GATE LOCK MECHANISM
 6'-1'-0"



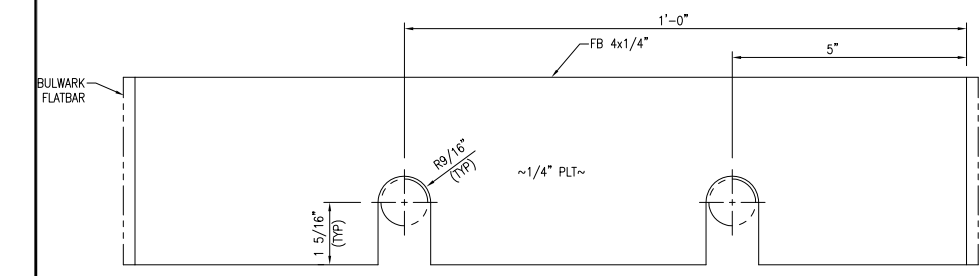
DETAIL 3-5B
 HINGE PLATE
 6'-1'-0"



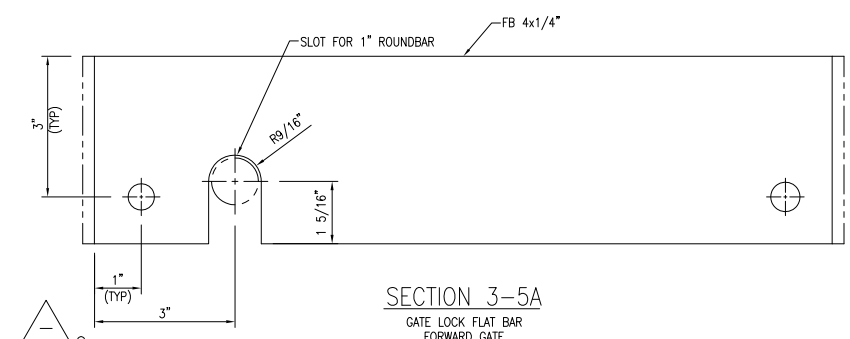
SECTION 3-4B
 STOPPER PLATE
 6'-1'-0"



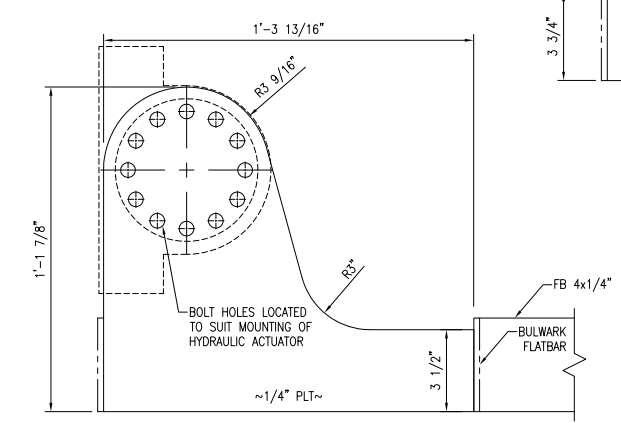
SECTION 3-1B
 HYDRAULIC ACTUATOR BRACKET
 FORWARD GATE
 3'-1'-0"



SECTION 3-7A
 GATE LOCK FLAT BAR
 AFT GATE
 6'-1'-0"



SECTION 3-5A
 GATE LOCK FLAT BAR
 FORWARD GATE
 6'-1'-0"



SECTION 3-3A
 HYDRAULIC ACTUATOR BRACKET
 AFT GATE
 3'-1'-0"

OREGON STATE UNIVERSITY
 CORVALLIS, OR 97331

199'-6" REGIONAL CLASS RESEARCH VESSEL

REMOVABLE BULWARKS
 BULWARK GATE DETAILS

SIZE D	FSCM CAGE NO. 7UTH5	DRAWING NO. 6096-160-001	REV -
SCALE: AS SHOWN		SHEET 3 OF 6	

8 7 6 5 4 3 2 1

8 7 6 5 4 3 2 1

D

C

B

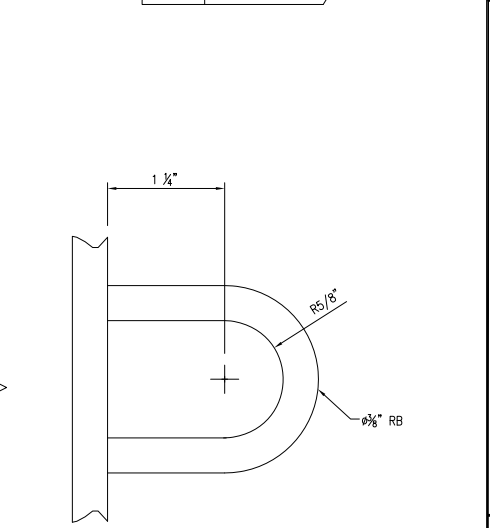
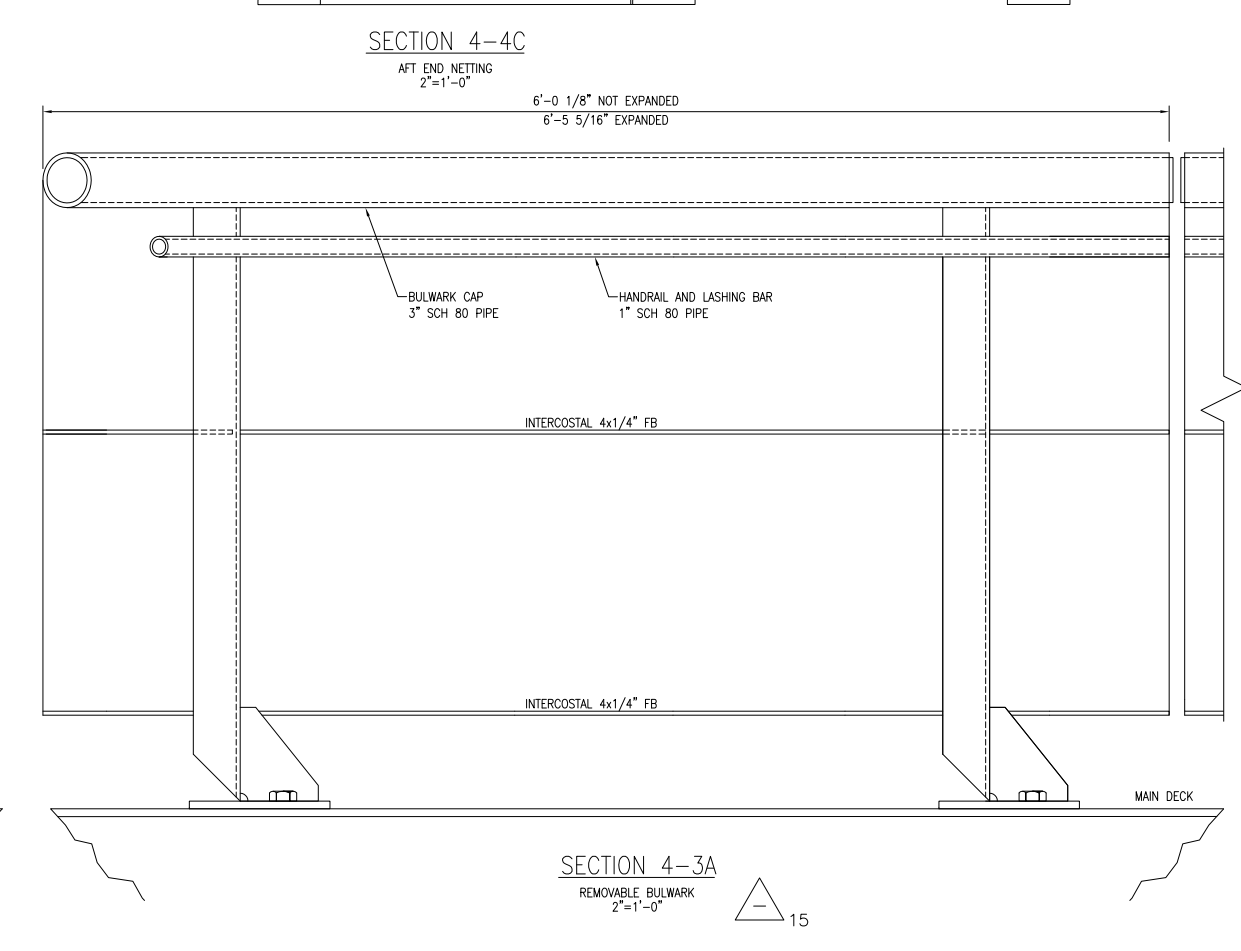
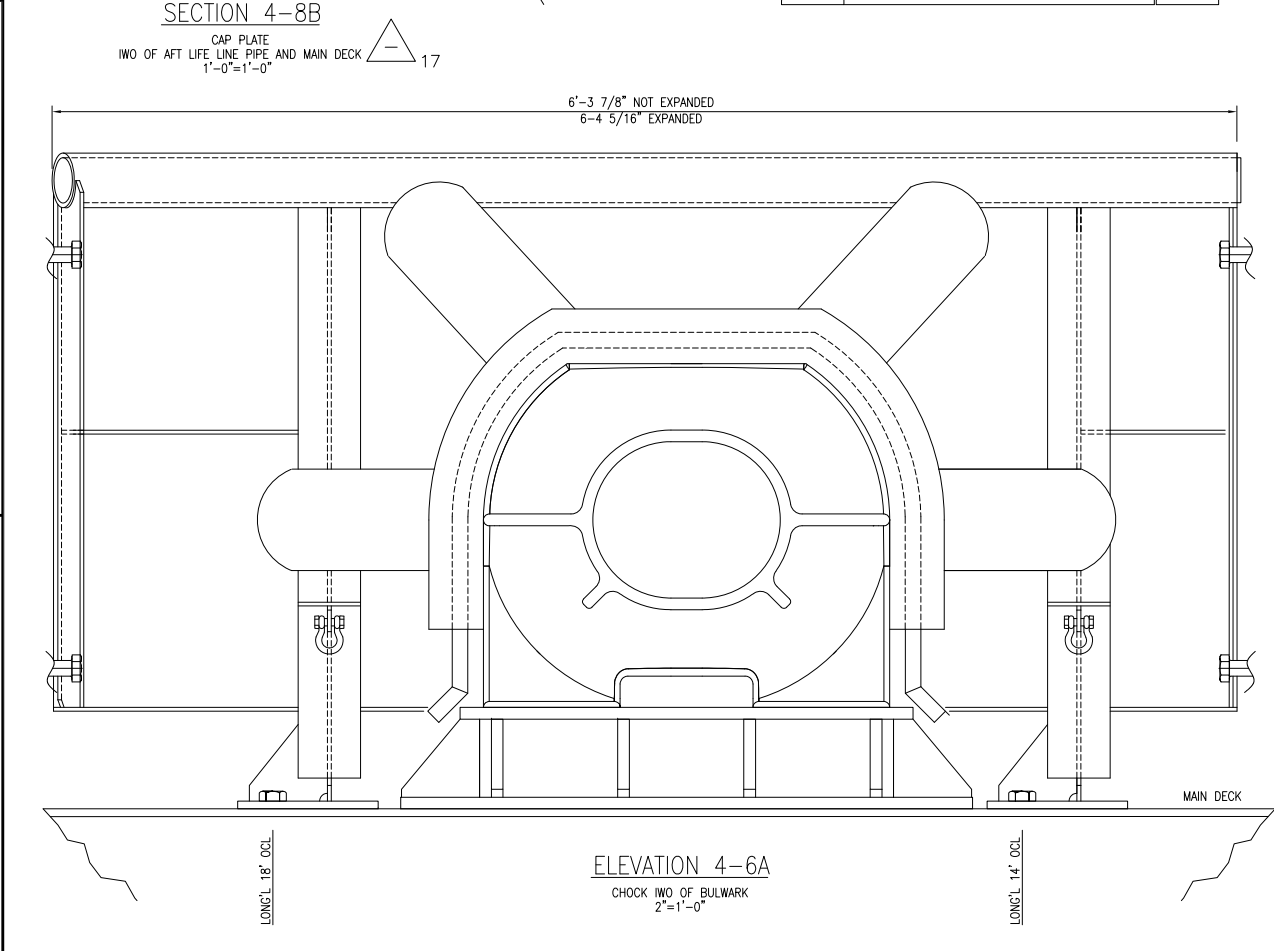
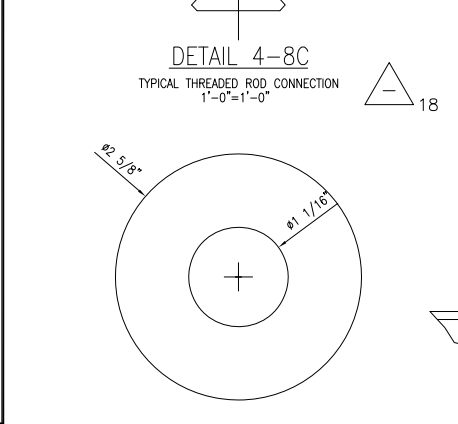
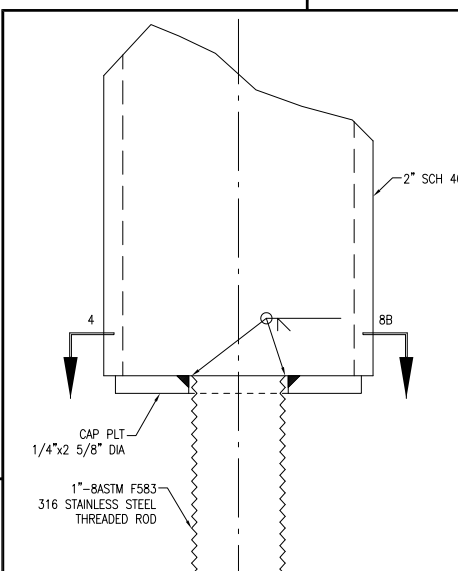
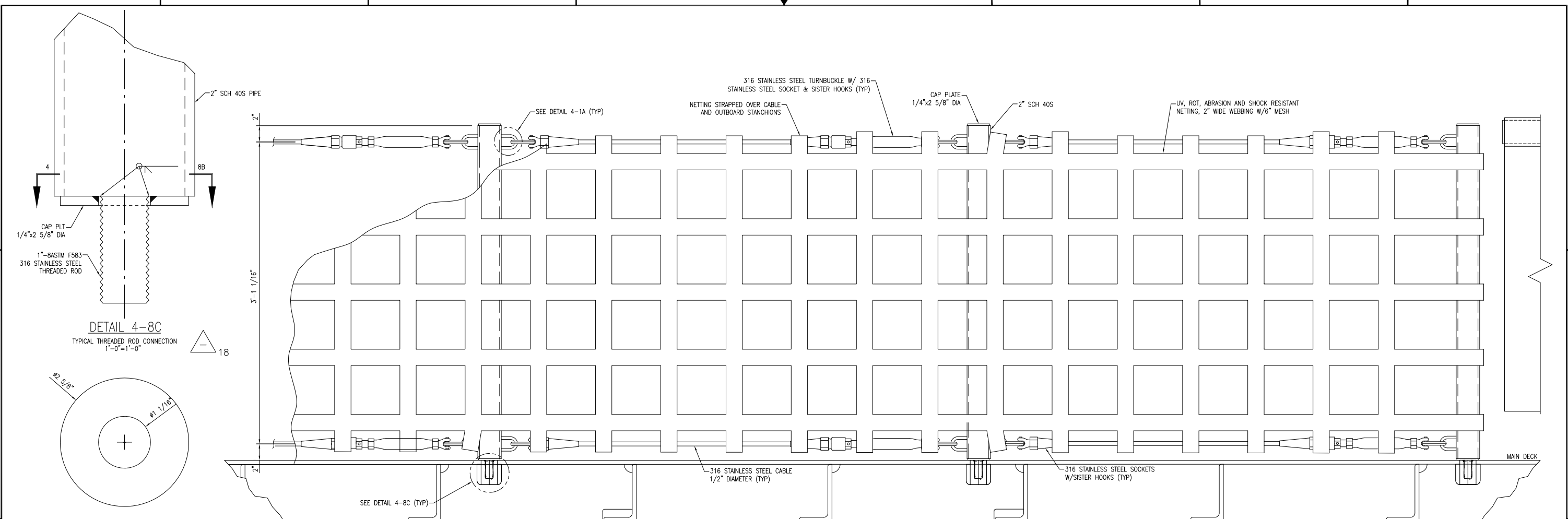
A

D

C

B

A



OREGON STATE UNIVERSITY CORVALLIS, OR 97331			
199'-6" REGIONAL CLASS RESEARCH VESSEL			
12 REMOVABLE BULWARKS STERN ARRANGEMENT DETAILS			
SIZE D	FSCM CAGE NO. 7UTH5	DRAWING NO. 6096-160-001	REV -
SCALE: AS SHOWN		SHEET 4 OF 6	

8 7 6 5 4 3 2 1

8 7 6 5 4 3 2 1

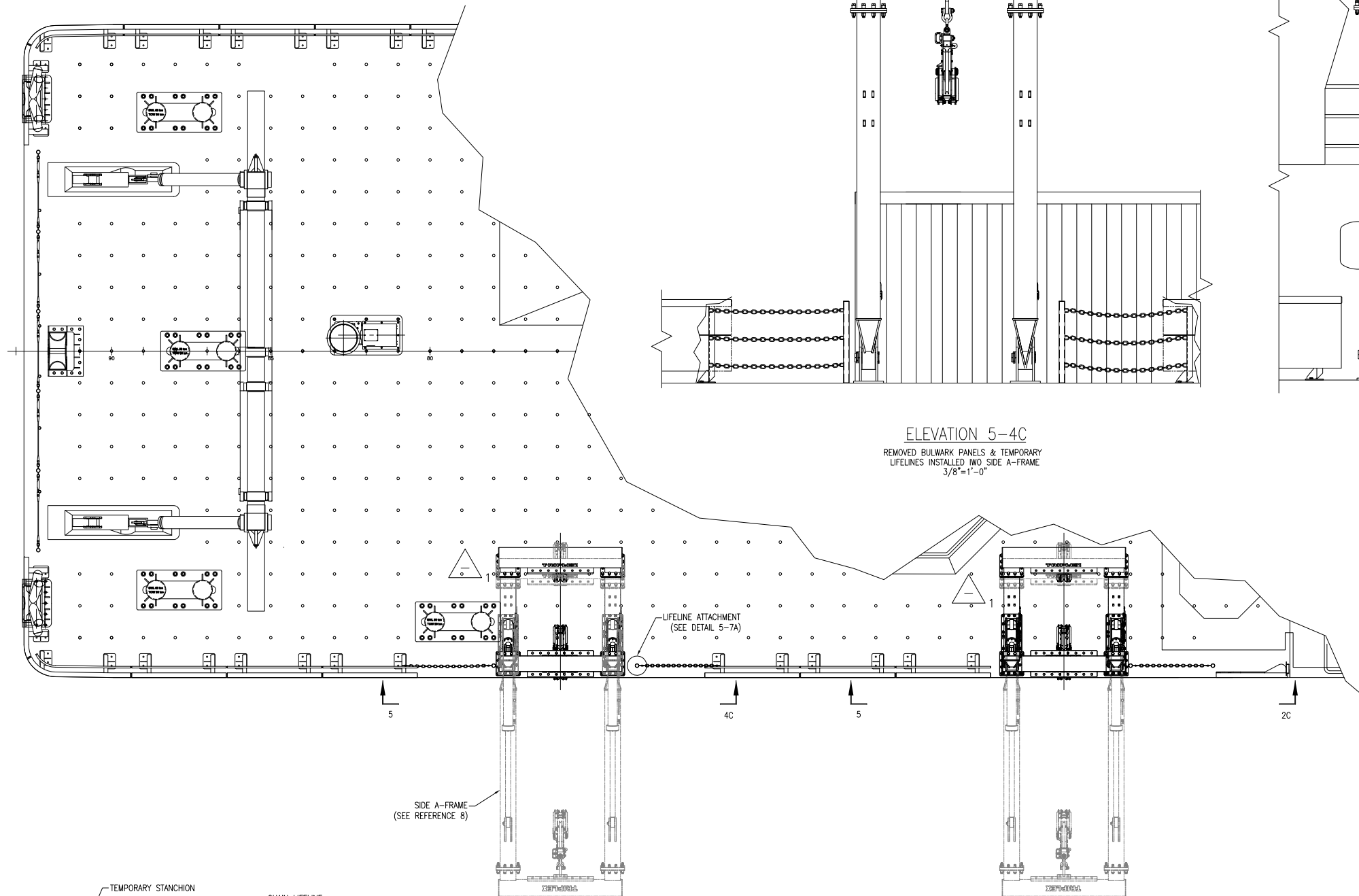
D D

C C

B B

A A

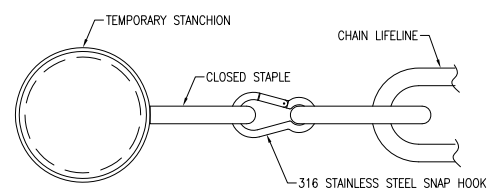
8 7 6 5 4 3 2 1



ELEVATION 5-4C
REMOVED BULWARK PANELS & TEMPORARY
LIFELINES INSTALLED TWO SIDE A-FRAME
3/8"=1'-0"

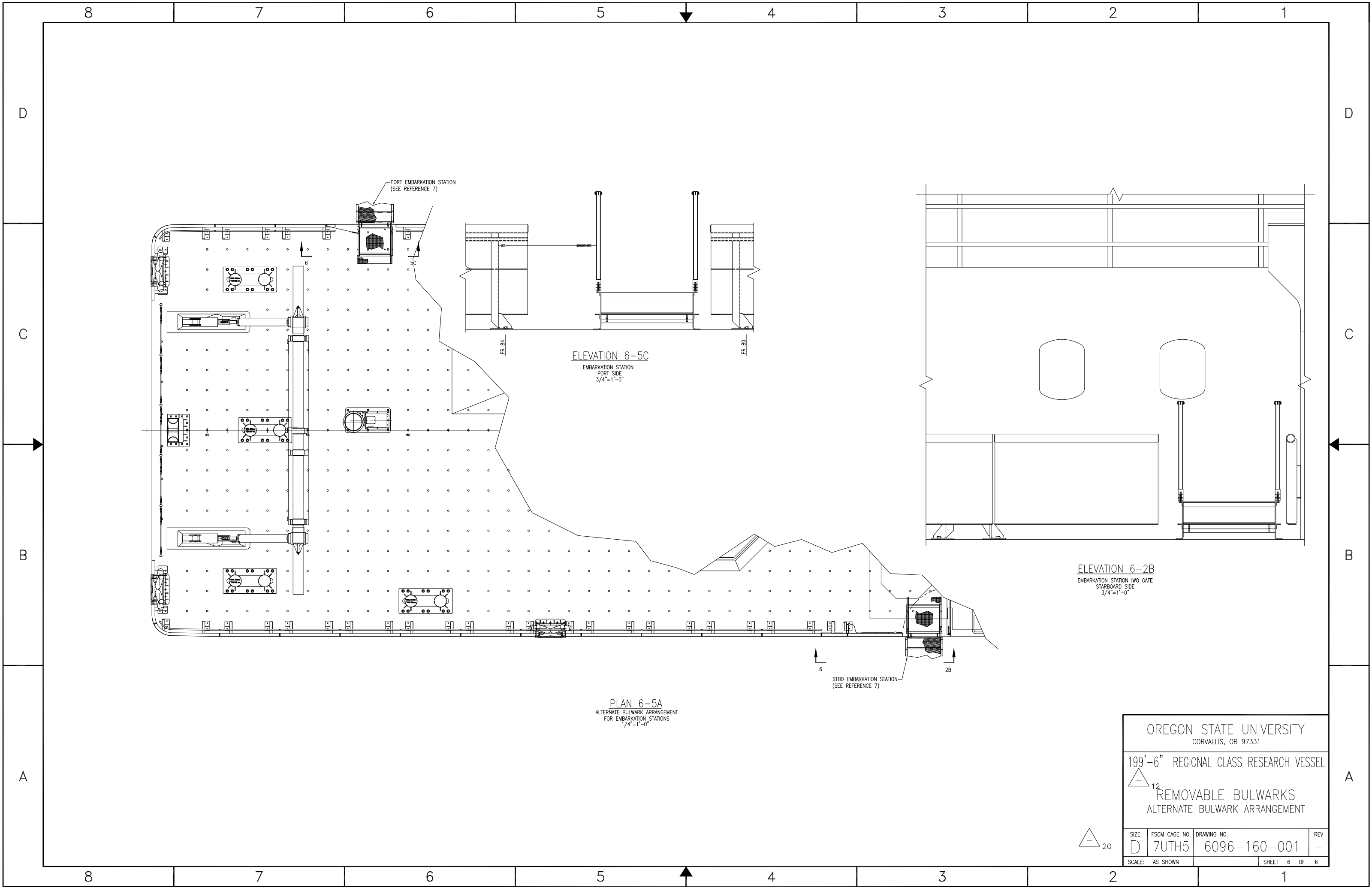
ELEVATION 5-2C
REMOVED BULWARK PANELS & TEMPORARY
LIFELINES INSTALLED TWO SIDE A-FRAME
3/8"=1'-0"

PLAN 5-5B
ALTERNATE BULWARK ARRANGEMENT
FOR A-FRAMES
1/4"=1'-0"



PLAN 5-7A
LIFELINE ATTACHMENT ARRANGEMENT
6"=1'-0"

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199'-6" REGIONAL CLASS RESEARCH VESSEL			
REMOVABLE BULWARKS ALTERNATE BULWARK ARRANGEMENT			
SIZE D	FSCM CAGE NO. 7UTH5	DRAWING NO. 6096-160-001	REV -
SCALE: AS SHOWN		SHEET 5 OF 6	



PORT EMBARKATION STATION
(SEE REFERENCE 7)

ELEVATION 6-5C
EMBARKATION STATION
PORT SIDE
3/4"=1'-0"

ELEVATION 6-2B
EMBARKATION STATION I/O GATE
STARBOARD SIDE
3/4"=1'-0"

PLAN 6-5A
ALTERNATE BULWARK ARRANGEMENT
FOR EMBARKATION STATIONS
1/4"=1'-0"

OREGON STATE UNIVERSITY CORVALLIS, OR 97331			
199'-6" REGIONAL CLASS RESEARCH VESSEL			
12 REMOVABLE BULWARKS ALTERNATE BULWARK ARRANGEMENT			
SIZE	FSCM CAGE NO.	DRAWING NO.	REV
D	7UTH5	6096-160-001	-
SCALE: AS SHOWN		SHEET 6 OF 6	

20