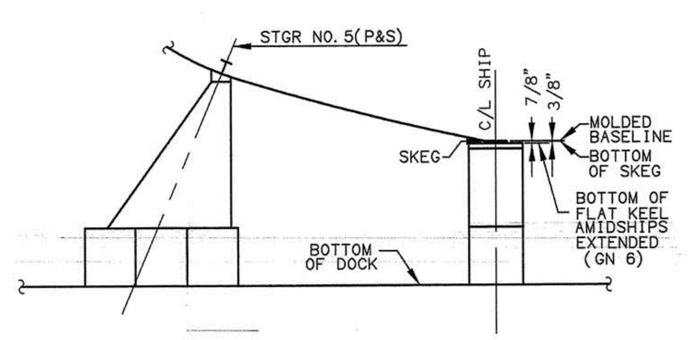
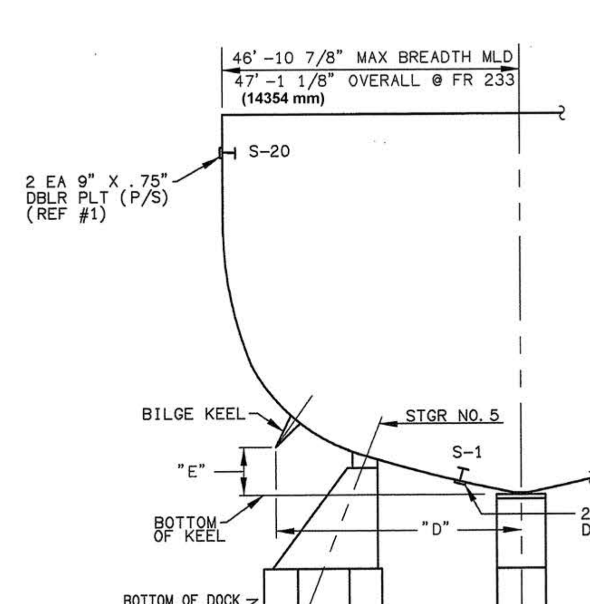
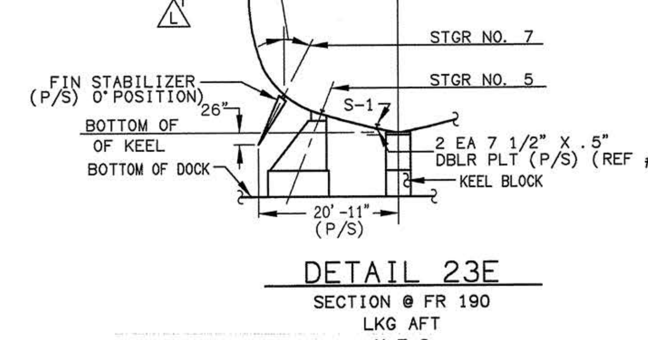


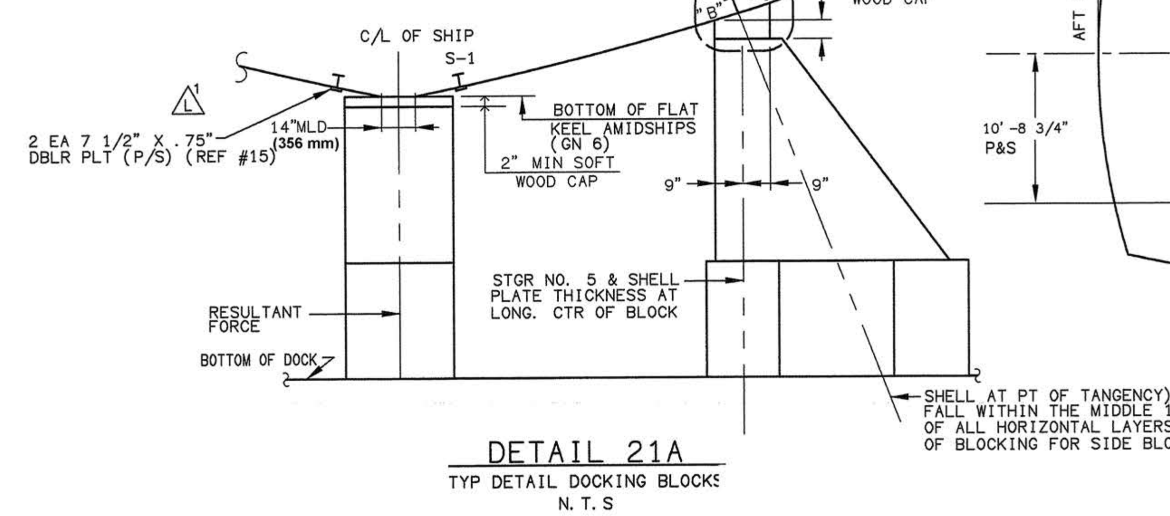
DETAIL 25D
SECTION @ FR 278
LKG AFT
N.T.S.



DETAIL 23A
SECTION @ FR 150
LKG AFT
N.T.S.



DETAIL 23E
SECTION @ FR 190
LKG AFT
N.T.S
(SEE GENERAL NOTE 4.D.)



DETAIL 21A
TYP DETAIL DOCKING BLOCKS
N.T.S

LIST OF ALL OPENINGS IN SHELL BELOW DESIGN WATER LEVEL

ITEM NO.	SERVICE	SIZE OF HOLE IN SHELL	OUTER PL PROTECTOR RING	SIDE OF SHIP	FWD	AFT	FRAME NEAR CENTER	FWD OF AFT END REF PT	DIST OFF CL SHIP	HT ABV KEEL TO CL	REFERENCES G&C DWG NO. PF-109	REFERENCES NAVSEA NO. PF-109	METRIC [mm] SIZE OF HOLE IN SHELL	METRIC FWD OF AFT END REF PT	METRIC DIST OFF CL SHIP	METRIC HT ABV KEEL TO CL
1	FIRE PUMP NO. 1 SUCTION SEACHEST (FR 172-175)	33 1/2"x 27"x 8"R COR	-	S	-	17 3/4"	172	247'-0 1/4"	8-6 7/8"	1'-10"	1631-U14	163-5416044	x 856 x 203R COR	75292	2613	559
2	DRAINAGE OVBD DISCH	3 1/8" DIA	3 7/8" DIA	S	-	3"	218	202'-3"	8'-0 3/8"	7'-2 7/8"	1631-U13	163-5416043				
3	EDUCTOR OVBD DISCH (MN DRAINAGE SYS)	5-1/16 DIA	5 13/16" DIA	P	-	26"	212	206'-4"	19'-6"	8'-5 7/8"						
4	DIESEL SW CIRC OVBD DISCH	5-1/16 DIA	5 13/16" DIA	S	5"	-	234	186'-11"	21'-3 3/8"	13'-1 1/2"	↓	↓				
5	SUCTION SEACHEST AMR 2 (FR 233-236)	33 1/2"x 27"x 8"R COR	-	P	17 3/4"	-	236	185'-11 3/4"	8'-6 1/4"	2'-1 1/4"	1631-U14	163-5416044				
6	SUCTION SEACHEST AMR 2 (FR 233-236)	33 1/2"x 27"x 8"R COR	-	S	17 3/4"	-	236	185'-11 3/4"	8'-6 1/4"	2'-1 1/4"						
7	SUCTION SEACHEST ENG RM (FR 250-253)	33 1/2"x 29"x 8"R COR	-	P	-	18 1/4"	250	168'-11 3/4"	8'-5"	2'-4 3/8"	↓	↓				
8	EDUCTOR OVBD DISCH (MN DRAINAGE SYS)	5 1/16" DIA	5 13/16" DIA	P	31"	-	258	165'-1"	21'-0 1/2"	12'-11 1/8"	1631-U13	163-5416043				
9	MN LUBO COOLER SW CIRC OVBD DISCH	6 1/16" DIA	7 1/16" DIA	S	14"	-	270	151'-8"	20'-6"	13' 0 1/8"						
10	EDUCTOR OVBD DISCH (MN DRAINAGE SYS)	5 1/16" DIA	5 13/16" DIA	S	-	4"	293	127'-2"	16'-7 1/4"	9'-9 1/4"	↓	↓				
11	SUCTION SEACHEST ENG RM (FR 250-253)	33 1/2"x 29"x 8"R COR	-	S	-	18 1/4"	250	168'-11 3/4"	8'-5"	2'-4 3/8"	1631-U14	163-5416044				
12	SUCTION SEACHEST AMR 3 (FR 304-308)	45 1/2"x 19"x 6"R COR	-	S	23 3/4"	-	308	114'-5 3/4"	3'-2"	3'-7"						
13	SUCTION SEACHEST AMR 3 (FR 297-300)	27 1/2"x 22 1/2"x 6"R COR	-	P	14 3/4"	-	300	121'-8 3/4"	3'-3"	2'-10"			8 x 572 x 152R COR	37103	991	864
14	SUCTION SEACHEST AMR 3 (FR 305-308)	33 1/2"x 19"x 6"R COR	-	P	17 3/4"	-	308	113'-11 3/4"	3'-2"	3'-7"						
15	SUCTION SEACHEST AMR 1 (FR 186-188)	24"x 27"x 8"RAD COR	-	P	13 3/4"	-	188	233'-7 3/4"	6'-2 1/2"	1'-2"	↓	↓				
16	MN & SECONDARY DRAIN & BALLAST SYS OVBD DISCH	2 5/8" DIA	3 3/8" DIA	S	9 3/4"	-	376	45'-3 3/4"	16' ABT -10"	17'-10"	——	529-5852505				
17	BLEED AIR COOLER/PRAIRIE COOLER OVBD DISCH	4 1/16" DIA	4 13/16" DIA	P	-	44"	264	152'-10"	17'-9 1/4"	9'-2 7/8"	1631-U13	163-5416043				
18	FILL FTG (BILGE KEEL)	3 3/4" DIA	-	P&S	-		141	279'-6"	15'-9"	7'-0 1/2"	1111-U03	111-5416018				
19	BOILER BLOW OVBD DISCH	1 3/8" DIA	2 1/8" DIA	S	-	6"	160	260'-0"	14'-2 1/4"	5'-4 1/4'	1631-U13	163-5416043				
20	LAUNDRY STEAM DRAIN DISCH	3 1/8" DIA	3 7/8" DIA	S	-	-	167	253'-6"	18'-4 3/8"	9'-3 3/8"						
21	SW CIRC SEACHEST VENT OVBD DISCH	2 5/8" DIA	3 3/8" DIA	P	42"	-	188	236-0"	21'-8"	17'-4 5/8"						
22	DIESEL SW CIRC OVBD DISCH	5 1/16" DIA	5 13/16" DIA	P	-	-	182	238'-6"	17'-10"	7'-5 7/8"						
23	SW COOLING OVBD DISCH	3 1/8" DIA	3 7/8" DIA	P	5"	-	204	216'-11"	19'-2 1/4"	8'-9 3/8"						
24	EDUCTOR OVBD DISCH	5 1/16" DIA	5 13/16" DIA	P	9"	-	204	217'-3"	18'-2 1/4"	7'-1 1/8"						
25	DIESEL SW CIRC & AIR CPRSR OVBD DISCH	6 1/16" DIA	7 1/16" DIA	P	4 1/2"	-	218	202'-10 1/2"	21'-7 3/4"	13'-3 3/8"						
26	SW CIRC SEACHEST VENT OVBD DISCH	2 5/8" DIA	3 3/8" DIA	P&S	-	21"	250	168'-9"	22'-2 1/2"	17'-10 1/2"						
27	START AIR COOLER OVBD DISCH	3 1/8" DIA	3 7/8" DIA	S	-	11"	264	155'-7"	20'-6"	13'-0 3/8"	↓	↓				
28	AUX PRPLN UNIT CLOSURE PLATE	7'-2 5/8"X 4'-2 3/4"x 6"R COR	-	P&S	-	-	104	316'-6"	4'-0"	1'-0"	1111-U03	111-5416018				
29	SONAR TRANSDUCER (CRES PROT COVERING)	16 1/4" DIA	18 3/4" DIA COVER	S	25"	-	140	282'-7"	3'-5 3/8"	8"	1861-U02	186-5416091				
30	DIESEL SW CIRC OVBD DISCH	5 1/16" DIA	5 13/16" DIA	P	25"	-	236	186'-7"	21'-1 5/8"	13'-1 7/8"	1631-U13	163-5416043				
31	DIESEL SW CIRC AND AIR CPRSR	5 1/16" DIA	5 13/16" DIA	P	-	10"	318	101'-8"	18'-4 1/4"	13'-6 1/8"						
32	OILY WATER SEPARATORS	1 3/8" DIA	3" DIA	P	-	8"	172	247'-10"	18'-9 1/4"	9'-2 1/8"						
33	WASTE & OILY WASTE	2 1/4" DIA	-	S	-	12"	300	119'-6"	19'-3"	13'-0 7/8"	↓	↓				
34	DRAIN PLUG	4 1/2" DIA	-	P	6"	-	32	389'-0"	9"	4 1/2"	1111-U01	111-5416016	114 DIA	118567	229	114
35	VENT PLUG (BILGE KEEL)	3 3/4" DIA	-	P&S	-	9"	156	263'-9"	17'-4 1/2"	6'-7 1/2"	1111-U04	111-5416019				
36	DRAIN PLUG (BILGE KEEL)	3 3/4" DIA	-	P&S	-	-	ABT 171	249'-6"	ABT 18' 1"	ABT 4'-0"	1111-U04	111-5416019				
37	DRAIN PLUG (SKEG)	4 1/2" DIA	-	CL	46"	-	344	80'-4"	0	0 7/8"	1111-U07	111-5416022				
38	FILL FTG (SKEG)	4 1/2" DIA	-	S	-	7"	348	71'-11"	10"	6'-10 7/8"	1111-U07	111-5416022				
39	DRAIN PLUG	4 1/2" DIA	-	S	-	6"	386	34'-0"	1'-1"	11'-6"	1111-U08	111-5416023				
40	DRAIN PLUG	4 1/2" DIA	-	S	-	6"	400	20'-0"	1'-1"	13'-0"	1111-U08	111-5416023				
41	DRAIN PLUG (SKEG)	1 1/2" DIA	-	CL	-	9"	284	135'-9"	0	0 7/8"	——	——				
42	FIREMAIN PRESSURE REGULATOR	5 3/4" DIA	-	S	1 1/4"	-	107	313'-7"	14'-9 1/2"	12'-9 1/2"	——	7262906				

TABLE OF DISPLACEMENT AND OTHER PROPERTIES FOR DOCKING BASED ON REF 8

MEAN DRAFT (FT)	DISPLACEMENT S.W. (TONS)	APPROX MOM TO CHANGE TRIM 1" (FOOT TONS)	LCB FWD OF STERN REF POINT (FT)	TONS PER INCH IMMERSION	LONG. CENTER OF FLOTATION: LCF AFT OF MIDSHIP (FT)	LONG. CENTER OF FLOTATION: LCF FWD OF STERN REF POINT (FT)
12	2550	585	221.80	28.80	14.93	201.57
13	2910	650	219.07	30.25	18.92	197.58
14	3287	718	216.43	31.45	22.60	193.90
15	3660	762	213.90	32.30	23.68	192.82
16	4050	793	211.85	33.05	24.09	192.41
17	4440	822	210.10	33.70	24.30	192.20

BEARING ON BLOCKS

SUPPORT	BEARING ON SHELL PLATE: 12'-0" SPACE BEARERS		8'-0" SPACE BEARERS		16'-0" SPACE BEARERS	
+SIDE BLOCKS	12,096	SQ. IN.	9,576	SQ. IN.	10,080	SQ. IN.
NET BEARING AREA 18" X 28"	84.0	SQ. FT	66.5	SQ. FT	70.0	SQ. FT
*KEEL BLOCKS	21,756	SQ. IN.	21,756	SQ. IN.	21,756	SQ. IN.
NET BEARING AREA 14" X 42"	151.08	SQ. FT	151.08	SQ. FT	151.08	SQ. FT
TOTAL BEARING	33,852	SQ. IN.	31,332	SQ. IN.	31,836	SQ. IN.
	235.08	SQ. FT	217.58	SQ. FT	221.08	SQ. FT
BEARING PER SQ IN BLOCKING	271.3	LBS	293.12	LBS	288.48	LBS
BEARING PER SQ FT BLOCKING	17.44	TONS	18.84	TONS	18.55	TONS
FULL LOAD DISPLACEMENT = 4100 TONS = 9,184,000 LBS						

*BASED ON A TOTAL OF 37 KEEL BLOCKS FOR POSITION NO. 2.
+12'-0" SPACE BEARERS - BASED ON A TOTAL OF 24 SIDE BLOCKS FOR POSITIONS 2.
+8'-0" SPACE BEARERS BASED ON A TOTAL OF 19 SIDE BLOCKS FOR POSITIONS 2 AND 3.
+16'-0" SPACE BEARERS BASED ON A TOTAL OF 20 SIDE BLOCKS FOR POSITION 2 AND 3.

GENERAL NOTES

1. DRAFT MARKS
   A. BLOCK ARABIC NUMERALS REPRESENT APPENDAGE AND CALCULATIVE DRAFT MARKS.
   B. CORRECTION TO DRAFT READING FOR CALCULATING PURPOSE IS INCHES FWD, INCHES AMIDSHIP AND INCHES AFT.
2. DIMENSIONS
   A. LONGITUDINAL LOCATIONS OF ALL ITEMS ARE GIVEN FROM THE STERN REF POINT (AFT END OF MN DK AT CENTERLINE).
   B. HEIGHT OF ALL ITEMS ARE GIVEN FROM THE BOTTOM OF KEEL AMIDSHIPS EXTENDED, EXCEPT AS SHOWN ABOVE BASE LINE.
   C. LONGITUDINAL, LOCATIONS AND HEIGHTS OF SIDE BLOCKS ARE TAKEN TO THE AFTER SIDE OF BLOCK.
3. COMPLETE PAINTING OF HULL
   A. IN ORDER TO CLEAN AND PAINT THE ENTIRE BOTTOM OF THE VESSEL IN THREE SUCCESSIVE DOCKINGS, THE FOLLOWING POSITIONS OF THE VESSEL ARE NECESSARY.
   (1) POSITION NO. 1
   AFTER END OF MAIN DECK (POINT OF REFERENCE) IS PLACED 143'-4" AFT OF AFTER SIDE OF NO. 1 SIDE BLOCK FOR 8'-0" & 16'-0" INTERVALS AND 151'-4" AFT OF AFTER SIDE OF NO. 1 BLOCK FOR 12'-0" INTERVALS.
   (2) POSITIONS NO. 2
   AFTER END OF MAIN DECK (POINT OF REFERENCE) IS PLACED 139'-4" AFT OF AFTER SIDE OF NO. 1 BLOCK FOR 8'-0' & 16'-0" INTERVALS AND 147'-4" AFT OF AFTER SIDE OF NO. 1 BLOCK FOR 12'-0' INTERVALS.
   (3) POSITION NO. 3
   AFTER END OF MAIN DECK (POINT OF REFERENCE) IS PLACED 147'-4" AFT OF AFTER SIDE OF NO. 1 BLOCK FOR 8'-0" AND 16'-0" INTERVALS AND 155'-4" AFT OF AFTER SIDE OF NO. 1 BLOCK FOR 12'-0" INTERVALS.
   B. REPEAT CYCLE OF POSITIONS, ASCERTAIN FROM THE VESSEL THE POSITION OF VESSEL AT ITS LAST DOCKING.
4. PROPELLER, SONAR DOME AND OTHER APPENDAGES
   A. IN DETERMINING THE HEIGHT OF KEEL BLOCKS, CARE IS TAKEN THAT PROPELLER TIPS, BOTTOM OF RUDDER, SONAR DOME AND OTHER APPENDAGES CLEAR BOTTOM OF DOCK.
   B. SONAR RUBBER DOME: THE MINIMUM DRYDOCKING HEIGHT FROM THE KEEL TO THE DRYDOCK FLOOR IS 11'-0" FOR A TRANSDUCER CHANGEOUT, AND 13'-6" FOR A DOME CHANGEOUT ONLY. (SEE REF. #2)
   C. SONAR COMPOSITE DOME: THE MINIMUM DRYDOCKING HEIGHT FROM THE KEEL TO THE DRYDOCK FLOOR IS 11'-0" FOR A TRANSDUCER CHANGEOUT AND 12'-6" FOR A DOME CHANGEOUT, ONLY. INCLUDE ADDITIONAL CLEARANCE FOR ROLLER SKIDS, PLANKS, OR BEAMS USED TO MOVE THE DOME. (SEE REF. #2 AND REF #18).
   D. FIN STABILIZERS: ENSURE THAT THE SIDE BLOCK BUILD-UP ALLOWS FOR 18" OF CLEARANCE TO FIN STABILIZERS. FOR FIN STABILIZER DIMENSIONS AND LOCATIONS SEE SHEET 2 (DETAILS 23A AND 23E, 2-10D, 2-10E). SEE SHEET 2, TABLE OF OFFSETS FOR SIDE BLOCKS, FOR IDENTIFICATION OF SIDE BLOCKS IN WAY OF FIN STABILIZERS.
5. BLOCKING
   A. THE BLOCKING SHOWN ON THIS PLAN IS THAT REQUIRED FOR DOCKING UNDER ORDINARY UNDAMAGED CONDITIONS FOR 8'-0", 12'-0" OR 16'-0" SPACED BEARERS IN DRY DOCK. IF THE SHIP IS DOCKED AT SIGNIFICANTLY LESS THAN FULL LOAD, ADDITIONAL SIDE BLOCKS MAY BE OMITTED. IN ALL CASES THE REQUIREMENTS OF REF. 17 MUST BE MET.
   B. KEEL BLOCKS (1067 mm) x (1219mm)
   (1) KEEL BLOCKS 42" (FORE AND AFT) X 48" (ATHWARTSHIP) SHALL BE ARRANGED IN PIERS CONSISTING OF THREE 14" X 14" HARDWOOD TIMBERS, MOUNTED WITH 2" MIN THICKNESS SOFT WOOD CAP BLOCKS. LONGITUDINAL SPACING TO BE 6'-0" CENTER TO CENTER WITH 30" CLEAR SPAN BETWEEN PIERS.
   (2) NO BLOCKS OR SHORES ARE REQUIRED UNDER ORDINARY CONDITIONS OF DOCKING UNDER BOW FWD OF FR 63 & UNDER STERN AFT OF FR 340.
   (3) TOTAL NO. OF KEEL BLKS FOR DCKG POSN NO. 1 IS 38 BLKS, POSN NO. 2 IS 37 BLKS & POSN NO. 3 IS 38 BLKS.
   (4) IN THE EVENT THAT PIER BLOCK ARRANGEMENT IS NOT PROVIDED, KEEL BLOCKS (USING 14" X 14" TIMBERS) SHALL BE SPACED 2'-0" CENTER TO CENTER BET. FRS 90 AND 310 CRIB BLOCKS UNDER BOW & SKEG FOR ABOUT 30'-0". CARE TO BE TAKEN THAT CRIBBING DOES NOT EXTEND FORWARD OF FR 63 & AFT OF FR 340.
   C. SIDE BLOCKS:
   (1) SIDE BLOCKS, SHOWN ON THIS PLAN IN ALL THREE DOCKING POSITIONS, ARE INDICATED ~~FOR 12'-0" SPACE BEARERS (S) AND 16'-0" SPACE BEARERS (P), EXCEPT AS NOTED.~~
   (2) TABLE OF OFFSETS WILL PERMIT DOCKING FROM PLAN IN DOCKS WHICH HAVE 8'-0", 12'-0" OR 16'-0" BEARING SPACING. BLOCK SPACING OF 12'-0" OR 16'-0" ONLY ARE REQUIRED. WHEN DOCKING OFF CENTER IN DOCKS WHICH HAVE 8'-0" BEARER SPACING IT IS PERMISSIBLE TO STAGGER THE BLOCKS, USING ODD NO. BLOCKS ON ONE SIDE AND EVEN NO. BLOCKS ON THE OTHER.
   (3) THE FOLLOWING ARE THE NO. OF SIDE BLOCKS 18" (ATHWARTHSHIP) X 28" (FORE & AFT) THAT WILL BE REQUIRED: (457 mm) x (711 mm)
   12'-0" SPACED BEARERS (POS #1) = 26, (POS #2) = 24, (POS #3) = 26, SIDE BLOCKS.
   8'-0" SPACED BEARERS (POS #1) = 20, (POS#2 & 3) = 19, SIDE BLOCKS.
   16'-0" SPACED BEARERS (POS #1) = 22, (POS #2 & 3) = 20, SIDE BLOCKS.
   (4) SIDE BLOCKS SHALL BE LOCATED P/S UNDER STRG NO. 5 AS INDICATED IN TABLE OF OFFSETS IN ACCORD WITH BEARER SPACING OF DOCK.
   (5) SOFT WOOD CAPS ARE REQUIRED.
   (6) DIRECTION OF BEVEL ON BLOCKS IN 28" IS DOWN (-) OR UP (+) FROM THE HEIGHT GIVEN AT AFTER SIDE OF THE BLOCK IN THE TABLE OF OFFSETS.
   (7) DIMENSIONS GIVEN IN TABLE OF OFFSETS ARE IN FEET, INCHES AND SIXTEENTHS.
   (8) SIDE BLOCKS ARE NUMBERED FROM AFT, FORWARD, WITH THE AFTER BLOCK AS NO. 1.
   (9) SIDE BLOCK SHALL BE BUILT UP AS INDICATED IN TYPICAL SECTIONS AND SHALL BE ADEQUATELY CRIBBED OR SHORED IN A FORE AND AFT DIRECTION TO ELIMINATE THE POSSIBILITY OF OVERTURNING BLOCKS.
   (10) BLOCKING USED IN LAMINATES FORMING THE SIDE BLOCKS CAN BE MODIFIED AT THE DISCRETION OF THE DOCKING MASTER.
   (11) SIDE BLOCK BEARING VARIES BETWEEN 30.00% & 36.97% OF TOTAL BLKG AREA.
6. BASE POINT FOR MEASURING VERTICAL DISTANCES FOR CALCULATIVE & LIMITING DRAFT MARKS SHALL BE AS INDICATED ON PROFILE PER REF. 1, SECT. 085.
7. WHEN RUDDER OR SONAR DOME REMOVAL IS NOT REQUIRED AT A PARTICULAR DOCKING, A MINIMUM OF FIFTEEN (15) INCH CLEARANCE FROM DOCK FLOOR TO UNDERSIDE OF DOME IS REQUIRED FOR CLEANING AND PAINTING OF DOME BOTTOM.
8. WHEN DRYDOCKING THE SHIP, DE-WATERING AND DEPRESSURIZING THE SONAR DOME SHALL BE IN ACCORDANCE WITH REF 13, THAT IS, AFTER THE DRYDOCK HAS BEEN PUMPED DRY. WHEN UNDOCKING THE SHIP, WATERING AND PRESSURIZATION OF SONAR DOME SHALL BE IN ACCORDANCE WITH REF 13, THAT IS, PRESSURIZED AND FILLED WITH WATER PRIOR TO FLOODING DRYDOCK.

NOTE: DOCKS WHICH HAVE 16'-0" SPACED BEARERS FOR SIDE BLOCKS SHALL USE ODD BLOCKS ONLY.

DENOTES FOR 8'-0" INCREMENTS, BLOCK IS OMITTED DUE TO INTERFERENCE WITH HULL APPENDAGE OR OPENING IN SHELL.
DENOTES FOR 16'-0" INCREMENTS, BLOCK IS OMITTED DUE TO INTERFERENCE WITH HULL APPENDAGE OR OPENING IN SHELL.
DENOTES BLOCK TO BE OMITTED IF INTERFERENCE OCCURS WITH FIN STABILIZER (NOTE: INTERFERENCE WILL OCCUR IF FIN IS JAMMED AT ANGLE GREATER THAN 20°).
SEE GENERAL NOTE 4.D. FOR BLOCK BUILD-UP CLEARANCE REQUIREMENTS IN WAY OF FIN STABILIZERS.

CRITICAL DIMENSIONS

LENGTH BETWEEN PERPENDICULARS	408'-0"	(124.36 m)
LENGTH OVERALL (MOLDED)	451'-10 3/8"	(137.73 m)
BREADTH MN DK FR 233 MOLDED	46'-10 7/8"	(14.30 m)
DISPLACEMENT AT TRIAL WL	3741 TONS	(3801 t)
FRAME SPACING THROUGHOUT	12"	(305 mm)
FIRST SIDE BLOCK	DISTANCE FROM STERN REF PT	
NO. 1 DOCKING POSITION (8'-0" & 16'-0" INTERVALS)	143'-4"	(43688 mm)
NO. 2 DOCKING POSITION (8'-0" & 16'-0" INTERVALS)	139'-4"	(42469 mm)
NO. 3 DOCKING POSITION (8'-0" & 16'-0" INTERVALS)	147'-4"	(44907 mm)
NO. 1 DOCKING POSITION (12'-0" INTERVALS)	151'-4"	
NO. 2 DOCKING POSITION (12'-0" INTERVALS)	147'-4"	
NO. 3 DOCKING POSITION (12'-0" INTERVALS)	155'-4"	
END OF SKEG	76'-1 3/4"	

TABLE OF OFFSETS FOR SIDE BLOCKS AND BILGE KEEL
INTERVALS GIVEN IN INCREMENTS OF 8'-0"
NO. 1 DOCKING POSITION

SIDE OF SHIP	BLOCK NO.	FWD OF AFT END REF PT	POINT "A" HALF BR	POINT "A" HEIGHT	POINT "B" HALF BR	POINT "B" HEIGHT	POINT "C" HALF BR	POINT "C" HEIGHT	BEVEL IN 28" FOR A, B, OR C	BILGE KEEL DIM "D"	BILGE KEEL DIM "E"
P	1	143'-4"	11-1-14	4-8-10	10-4-14	4-4-4	11-10-14	5-1-1	-0-1-10		
S	1	143'-4"	11-1-14	4-8-10	10-4-14	4-4-4	11-10-14	5-1-1	-0-1-10		
P	2	151'-4"	11-4-8	4-4-6	10-7-8	4-0-2	12-1-8	4-8-12	-0-1-7		
S	2	151'-4"	11-4-8	4-4-6	10-7-8	4-0-2	12-1-8	4-8-12	-0-1-7		
P	3	159'-4"	11-6-15	4-0-14	10-9-15	3-8-13	12-3-15	4-5-1	-0-1-3		
S	3	159'-4"	11-6-15	4-0-14	10-9-15	3-8-13	12-3-15	4-5-1	-0-1-3		
P	4	167'-4"									
S*	4	167'-4"									
P	5	175'-4"	11-10-8	3-7-10	11-1-8	3-3-15	12-7-8	3-11-8	-0-0-13		
S	5	175'-4"	11-10-8	3-7-10	11-1-8	3-3-15	12-7-8	3-11-8	-0-0-13		
P	6	183'-4"									
S*	6	183'-4"									
P	7	191'-4"	12-0-10	3-3-12	11-3-10	3-0-5	12-9-10	3-7-6	-0-0-8		
S	7	191'-4"	12-0-10	3-3-12	11-3-10	3-0-5	12-9-10	3-7-6	-0-0-8		
P	8	199'-4"	12-1-7	3-2-7	11-4-7	2-11-1	12-10-7	3-6-0	-0-0-6		
*S	8	199'-4"									
P	9	205'-4"	12-2-0	3-1-7	11-5-0	2-10-3	12-11-0	3-4-15	-0-0-4		
S	9	205'-4"	12-2-0	3-1-7	11-5-0	2-10-3	12-11-0	3-4-15	-0-0-4		
P	10	211'-4"	12-2-8	3-0-15	11-5-8	2-9-12	12-11-8	3-4-6	-0-0-1		
S	10	211'-4"	12-2-8	3-0-15	11-5-8	2-9-12	12-11-8	3-4-6	-0-0-1		
P	11	217'-4"	12-2-11	3-0-15	11-5-11	2-9-10	12-11-11	3-4-7	+0-0-1		
S	11	217'-4"	12-2-11	3-0-15	11-5-11	2-9-10	12-11-11	3-4-7	+0-0-1		
P	12	223'-4"	12-2-10	3-1-5	11-5-10	2-9-15	12-11-10	3-4-14	+0-0-3		
S	12	223'-4"	12-2-10	3-1-5	11-5-10	2-9-15	12-11-10	3-4-14	+0-0-3		
P	13	239'-4"									
S	13	239'-4"									
P	14	247'-4"	12-1-1	3-2-9	11-4-1	2-10-15	12-10-1	3-6-7	+0-0-7	18-2-11	4-1-1
S	14	247'-4"	12-1-1	3-2-9	11-4-1	2-10-15	12-10-1	3-6-7	+0-0-7	18-2-11	4-1-1
P	15	255'-4"	11-10-11	3-3-0	11-1-11	2-11-4	12-7-1	3-7-1	+0-0-8	18-5-14	3-9-11
S	15	255'-4"	11-10-11	3-3-0	11-1-11	2-11-4	12-7-1	3-7-1	+0-0-8	18-5-14	3-9-11
P	16	263'-4"	11-9-9	3-4-6	11-0-9	3-0-6	12-6-9	3-8-13	+0-0-10	18-2-11	4-0-13
S	16	263'-4"	11-9-9	3-4-6	11-0-9	3-0-6	12-6-9	3-8-13	+0-0-10	18-2-11	4-0-13
P	17	271'-4"	11-5-1	3-4-8	10-8-1	3-0-4	12-2-1	3-9-3	+0-0-13	17-9-8	4-6-2
S	17	271'-4"	11-5-1	3-4-8	10-8-1	3-0-4	12-2-1	3-9-3	+0-0-13	17-9-8	4-6-2
P	18	279'-4"	10-11-8	3-4-10	10-2-13	3-0-2	11-8-13	3-9-10	+0-0-15	16-6-7	5-9-2
S	18	279'-4"	10-11-8	3-4-10	10-2-13	3-0-2	11-8-13	3-9-10	+0-0-15	16-6-7	5-9-2
P	19	287'-4"	10-8-1	3-5-13	9-11-1	3-0-15	11-5-1	3-11-6	+0-1-1		
S	19	287'-4"	10-8-1	3-5-13	9-11-1	3-0-15	11-5-1	3-11-6	+0-1-1		
P	20	295'-4"	10-3-10	3-6-15	9-6-10	3-1-9	11-0-10	4-1-2	+0-1-3		
S	20	295'-4"	10-3-10	3-6-15	9-6-10	3-1-9	11-0-10	4-1-2	+0-1-3		
P	21	303'-4"	9-10-13	3-8-1	9-1-13	3-2-4	10-7-13	4-2-12	+0-1-7		
S	21	303'-4"	9-10-13	3-8-1	9-1-13	3-2-4	10-7-13	4-2-12	+0-1-7		
P	22	311'-4"	9-5-11	3-9-5	8-8-11	3-2-15	10-2-11	4-4-11	+0-1-10		
S	22	311'-4"	9-5-11	3-9-5	8-8-11	3-2-15	10-2-11	4-4-11	+0-1-10		
P	23	319'-4"	9-1-4	3-11-9	8-4-4	3-4-6	9-10-4	4-7-15	+0-1-15		
S	23	319'-4"	9-1-4	3-11-9	8-4-4	3-4-6	9-10-4	4-7-15	+0-1-15		

* DENOTES: BLOCK OMITTED DUE TO INTERFERENCE WITH HULL APPENDAGE OR OPENING IN SHELL.

Metric [mm]

TABLE OF OFFSETS FOR SIDE BLOCKS AND BILGE KEEL
INTERVALS GIVEN IN INCREMENTS OF 8'-0" (2438mm)
NO. 1 DOCKING POSITION
(711 mm)

Side of Ship	Block No.	Point "A" Height	Point "B" Half BR	Point "B" Height	Point "C" Height	Bevel In 28" for A, B, or C	Bilge Keel Dim "D"	Bilge Keel Dim "E"
P/S	1	1438	3172	1327	1551	-41		
P/S	7	1010	3445	922	1102	-13		
P/S	15	991	3396	895	1094	13	5636	1160
P/S	19	1062	3024	938	1203	27		
P/S	23	1208	2546	1026	1421	49		

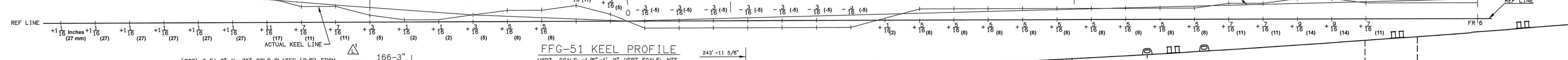
TABLE OF OFFSETS FOR SIDE BLOCKS AND BILGE KEEL
INTERVALS GIVEN IN INCREMENTS OF 12'-0"
NO. 3 DOCKING POSITION

SIDE OF SHIP	BLOCK NO.	FWD OF AFT END REF PT	POINT "A" HALF BR	POINT "A" HEIGHT	POINT "B" HALF BR	POINT "B" HEIGHT	POINT "C" HALF BR	POINT "C" HEIGHT	BEVEL IN 28" FOR A, B, OR C	BILGE KEEL DIM "D"	BILGE KEEL DIM "E"
P	1	155'-4"	11-5-12	4-2-9	10-8-12	3-10-6	12-2-12	4-6-13	-0-1-5		
S	1	155'-4"	11-5-12	4-2-9	10-8-12	3-10-6	12-2-12	4-6-13	-0-1-5		
P	2	167'-4"									
S*	2	167'-4"									
P	3	179'-4"	11-11-3	3-6-9	11-2-3	3-2-15	12-8-3	3-10-5	-0-0-12		
S	3	179'-4"	11-11-3	3-6-9	11-2-3	3-2-15	12-8-3	3-10-5	-0-0-12		
P	4	191'-4"	12-0-10	3-3-12	11-3-10	3-0-5	12-9-10	3-7-6	-0-0-8		
S	4	191'-4"	12-0-10	3-3-12	11-3-10	3-0-5	12-9-10	3-7-6	-0-0-8		
P	5	203'-4"	12-1-12	3-1-15	11-4-12	2-10-10	12-10-12	3-5-7	-0-0-5		
S	5	203'-4"	12-1-12	3-1-15	11-4-12	2-10-10	12-10-12	3-5-7	-0-0-5		
P	6	215'-4"	12-2-8	3-0-15	11-5-8	2-9-12	12-11-8	3-4-6	-0-0-1		
S	6	215'-4"	12-2-8	3-0-15	11-5-8	2-9-12	12-11-8	3-4-6	-0-0-1		
P	7	227'-4"	12-2-11	3-1-0	11-5-11	2-9-11	12-11-11	3-4-10	+0-0-2		
S	7	227'-4"	12-2-11	3-1-0	11-5-11	2-9-11	12-11-11	3-4-10	+0-0-2		
P	8	239'-4"									
S*	8	239'-4"									
P	9	251'-4"	12-0-3	3-2-14	11-3-3	2-11-3	12-9-3	3-6-14	+0-0-7	18-6-0	3-9-9
S	9	251'-4"	12-0-3	3-2-14	11-3-3	2-11-3	12-9-3	3-6-14	+0-0-7	18-6-0	3-9-9
P	10	263'-4"	11-9-9	3-4-6	11-0-9	3-0-6	12-6-9	3-8-13	+0-0-10	18-2-11	4-0-13
S	10	263'-4"	11-9-9	3-4-6	11-0-9	3-0-6	12-6-9	3-8-13	+0-0-10	18-2-11	4-0-13
P	11	275'-4"	11-3-0	3-4-13	10-6-0	3-0-7	12-0-0	3-9-11	+0-0-14	17-3-13	4-11-15
S	11	275'-4"	11-3-0	3-4-13	10-6-0	3-0-7	12-0-0	3-9-11	+0-0-14	17-3-13	4-11-15
P	12	287'-4"	10-8-1	3-5-13	9-11-1	3-0-15	11-5-1	3-11-6	+0-1-1		
S	12	287'-4"	10-8-1	3-5-13	9-11-1	3-0-15	11-5-1	3-11-6	+0-1-1		
P	13	299'-4"	10-1-2	3-7-6	9-4-2	3-1-7	10-10-2	4-1-15	+0-1-6		
S	13	299'-4"	10-1-2	3-7-6	9-4-2	3-1-7	10-10-2	4-1-15	+0-1-6		
P	14	311'-4"	9-5-11	3-9-5	8-8-11	3-2-15	10-2-11	4-4-11	+0-1-10		
S	14	311'-4"	9-5-11	3-9-5	8-8-11	3-2-15	10-2-11	4-4-11	+0-1-10		
P	15	323'-4"	8-9-14	3-11-14	8-0-14	3-4-6	9-6-14	4-8-11	+0-2-2		
S	15	323'-4"	8-9-14	3-11-14	8-0-14	3-4-6	9-6-14	4-8-11	+0-2-2		

* DENOTES: BLOCK OMITTED DUE TO INTERFERENCE WITH HULL APPENDAGE OR OPENING IN SHELL.

REVISIONS

REV	ITEM	ZONE	SHT. NO.	DESCRIPTION	BY	DATE	APPD
J	1	ALL	1	THIS DRAWING WAS DEVELOPED FROM REVISION H AND HAS BEEN CONVERTED TO AN AUTOCAD DRAWING IN ITS ENTIRETY AND HAS BEEN EDITORIALLY CHANGED TO IMPROVE LEGIBILITY AND TO CORRECT ANY ERRORS INCURRED AS A RESULT OF ITS CONVERSION TO AUTOCAD. REVISED DRAWING THRU OUT TO SUIT ENGINEERING MARKUP DATED 9 MARCH 2005.	JPK	3/17/05	
				BLOCK CLEARANCE INCREASED TO 18" PER NSTM CH997 1 AUGUST 1984. REVISED FOR E-Z DROP SYSTEM TO SUIT INSTALLATION OF S/A 476D DURING SRA 9, 2005. REVISED DIMENSIONS OF STERN FLAP PREVIOUSLY INSTALLED DURING DSRA 7, 2002 TO SUIT ACTUAL INSTALLATION. ADDED FIREMAIN PRESSURE REGULATOR TO DWG AND LIST OF OPENINGS TO SUIT ENGINEERING MARKUP DATED 3/30/05 AND INSTALLATION OF S/A 351D DURING DSRA 7, 2002	SRS	5/02/05	
K	1	ALL	ALL	CONVERTED DRAWING FROM 1 SHEET 37 ZONE FORMAT TO 2 SHEET 26 ZONE FORMAT FOR EASE OF ELECTRONIC TRANSFER TO JEDMICS, IT HAS BEEN EDITORIALLY CHANGED TO IMPROVE LEGIBILITY AND TO CORRECT ANY ERRORS INCURRED AS A RESULT OF ITS CONVERSION TO AUTOCAD. CHECKED BLOCKS FOR 18" CLEARANCE AND OMITTED BLOCKS ACCORDINGLY.	BWS	03/24/06	CVP
L	1	8F 12D VAR	1	ADDED GENERAL NOTE 4. D. REVISED GN 5. A. REVISED REFERENCES 1, 13, 15, 16, 17 AND 18. ADDED FIN STABILIZER BLOCK CLEARANCE INDICATORS (#) TO THE SIDE BLOCK OFFSET TABLES.	BEG	11/12/09	
		VAR 23E 23E	2	CORRECTED DOUBLER PLATE NOTES. CORRECTED FIN STABILIZER ANGLE. ADDED GENERAL NOTE CALLOUT FOR FIN STABILIZER BLOCK CLEARANCE.	PCG	11/12/09	
					LCK	11/12/09	



FFG-51 KEEL PROFILE
HORZ. SCALE: =1/8"=1'-0" VERT SCALE: NTS

DISTANCE BELOW BOTTOM OF KEEL AMIDSHIPS EXTENDED REQUIRED TO REMOVE RUDDER EQUALS 10'-5"
IF RUDDER IS TILTED. USE 13'-3"
IF RUDDER IS DROPPED VERTICALLY.

DISTANCE AFT OF AFTER END OF MN DK (PT OF REFERENCE) REQUIRED TO REMOVE TAIL SHAFT EQUALS 0.

NOTES:
1. KEEL BLOCKS AND SIDE BLOCKS AS INDICATED ARE FOR NO. 1 DOCKING POSITION.
2. THIS PLAN INDICATES STBD SIDE BLOCKS IN INCREMENTS OF 12'-0" INTERVALS AND PORT SIDE BLOCKS IN INCREMENTS OF 16'-0" INTERVALS, EXCEPT AS SHOWN FOR INCREMENTS OF 8'-0" STAGGERED INTERVALS ON STBD SIDE.

DM Consulting
FFG Teaching Document
V4

ERECTION UNIT NO.	FFG - 51 / SHIPS ID NO.	TODD PACIFIC SHIPYARDS CORP SEATTLE DIV / BUILDING YARD

BATH IRON WORKS CORPORATION
SUBSIDIARY OF BATH INDUSTRIES, INC.
SHIPBUILDERS AND ENGINEERS
BATH-MAINE

CONTRACT NO. N00024-74-C-0207
GIBBS & COX INC.
NO. PF-109
8011-151

DESIGN & ENGINEERING BY GIBBS & COX, INC. NEW YORK, N.Y.

DRAWN/PREPARED BWS
CHECKED SRS
EXAMINED P. GROSS
APPROVED C. PASHOS
DATE 3/24/06

FFG-51
DOCKING PLAN

DOCKING PLAN FFG 51

THIS DRAWING WAS CONVERTED TO CAD AT REV J BY BIW PY.
R.D. Vandikke 3/24/06

SIZE	CODE IDENT NO	NAVSHIP DWG NO	REV
H	53711	PF 109 801 5416970	L

NOT TO SCALE