STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
16 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0016

Janet T. Mills
GOVERNOR

Bruce A. Van Note
COMMISSIONER

May 27, 2022
Subject: Matinicus Island Ferry Replacement
State WIN: 024897.10
Location: **Rockland**
Amendment No. 1

Dear Sir/Ms.:

For your information and review:

The video taken at the mandatory pre-bid meeting held May 18, 2022 has been posted to the MaineDOT web site. It can be viewed at the following URL:

https://youtu.be/oPmN62WT9Hk

By signing your bid, you certify that you have viewed the video, which fulfills the requirement of attending the mandatory pre-bid meeting.

Please make the following changes to the Bid Documents:

In the Bid Book:

CHANGE on page 14, the bid opening date from "June 15, 2022" to read "**July 6, 2022**". Make this change in pen and ink.

ADD the attached D-367 Weight Estimate, 36 pages, dated 5/25/22.

ADD the attached FERNSTRUM RECOMMENDATION, 4 pages, dated 8/3/2021.

In the Plan Set:

REMOVE DWG. NO. D367-A1-1, GENERAL ARRANGEMENT HOLD & MAIN DECK and **REPLACE** with the attached DWG. NO. D367-A1-1 ALT. 1, GENERAL ARRANGEMENT HOLD & MAIN DECK.

REMOVE DWG. NO. D367-P9, BILGE PIPE SCHEMATIC & SEA CHEST DETAILS and **REPLACE** with the attached DWG. NO. D367-P9 ALT. 1, BILGE PIPE SCHEMATIC & SEA CHEST DETAILS.

REMOVE DWG. NO. D367-P12, VENTS, FILLS & SOUNDING TUBE PIPE SCHEMATIC & DETAILS and **REPLACE** with the attached DWG. NO. D367-P12 ALT. 1, VENTS, FILLS & SOUNDING TUBE PIPE SCHEMATIC & DETAILS.

The following questions have been received:

Question: Which American Bureau of Shipping rules apply to the vessel?

Answer: This vessel is a subchapter "T" vessel and the CFR makes reference to ABS rules for vessels under 200 feet, latest edition is 1983.

Question: FM200 fire suppressant is no longer manufactured and has been replaced with Novec 1230, should we use this in its place?

Answer: Yes, "General Arrangement plans hold and main deck" D367-A1-1 have been edited as Alt 1 show the locker starboard side labeling the suppressant as Novec 1230. The following edits applies to the specifications section 555.1.1 "FM200 FIXED SYSTEMS" replace in this section any mention of FM200 with Novec 1230.

Question: Can we receive copy of the data sheets from fernstrum outlining coolant water flow, water temperature and vessel speed used for each diesel?

Answer: Fernstrum data sheets are provided with this amendment.

Question: Can we receive copy of the steel weight for the vessel?

Answer: Weight estimate is included with this amendment.

Question: We are requesting a 3 week extension for the bid package that is due June 15 2022 for the Matinicus Island Ferry replacement. The new date would be July 6 2022. if approved.

Response: The bid opening date has been moved to July 6, 2022.

Question: We see no notes/videos from minutes from Pre-Bid Conference. Are there any updates?

Response: The video taken at the pre-bid meeting held May 18, 2022 has been posted to the MaineDOT web site.

Question: We are not on the plan holder list, is this required?

Response: There is no requirement to register as a plan holder in order to bid.

Please note, the Department has several outstanding RFIs that will be addressed in a forthcoming amendment next week.

Consider these changes and information prior to submitting your bid on **July 6, 2022**.

Sincerely,

George M. A. Macdougall P.E.
Contracts & Specifications Engineer

D-367 Weight Estimate - 104 ft Matinicus Ferry - Gilbert Associates, Inc. Date: 5/25/22 By: KVC

Summary

Group	Item Location	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
Group I	Steel Below Main Deck	94.3	6.78	639.5	2.92	275.6
Group II	Steel Below Above Deck	29.7	19.53	579.4	0.18	5.4
Group III	Included above					
Group IV	Joinerwork	3.1	16.1	49.2	5.25	16.1
Group V	Hull Outfit	13.5	15.8	212.6	8.0	108.1
Group VI	Bow Door	2.6	15.8	41.4	-47.6	-124.8
Group VII	Spars and Rigging	0.1	40.8	5.1	-9.3	-1.2
Group VIII	Furniture	1.4	17.9	25.2	1.3	1.8
Group IX	Main Machinery	7.9	4.3	34.3	17.4	137.5
Group X	Auxiliary Machinery	7.5	7.4	55.4	7.7	57.7
Group XI	Machinery Outfit	4.0	11.0	43.3	11.0	43.4
Group XII	Piping	7.0	6.2	43.5	4.0	27.8
Group XIII	Electrical	4.8	12.5	60.4	0.7	3.6
Group XIV	Paint & Weld	5.1	6.9	34.9	1.0	5.1
Total Lightship		**180.9**	**10.08**	**1824.4**	**3.07**	**556.1**

D-367 Weight Estimate Date: 5/3/22 By: KVC

Steel Below Main Deck

Item Location	Size		#	Area/ Length (ft^2)	Unit Weight (lb)	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
BOTTOM/CHINE PLATE										
Bottom shell & Chine plate	3/8"		2	972.3	15.32	13.30	2.82	37.51	1.231	16.38
SIDE/SPONSON PLATE										
Side shell & Sponson Plate	5/16" PLT		2	783.4	12.76	8.93	6.90	61.59	-5.596	-49.95
DECK PLATE										
Main Deck Plate	7/16" PLT		2	642.3	17.87	10.25	11.00	112.73	-0.16	-1.68
Main Deck Plate	5/16" PLT		2	700.8	12.76	7.98	11.00	87.82	-1.77	-14.10
Main Deck Beams	4"x3"x5/16" L		2	70.1	7.2	0.45	10.75	4.84	-0.60	-0.27
Main Deck Beams	4"x3"x5/16" L		2	82.1	7.2	0.53	10.78	5.69	0.14	0.07
Main Deck Beams	4"x3"x5/16" L		2	88.4	7.2	0.57	10.83	6.15	0.28	0.16
Main Deck Beams	4"x3"x5/16" L		2	91.7	7.2	0.59	10.87	6.41	0.23	0.14
Main Deck Beams	5"x3"x5/16" L		2	86.7	8.2	0.63	10.87	6.90	0.23	0.15
Main Deck Beams	5"x3"x5/16" L		2	55.0	8.2	0.40	10.90	4.39	-4.00	-1.61
Main Deck Beams	5"x3"x5/16" L		2	91.7	8.2	0.67	10.91	7.32	4.00	2.68
Main Deck Beams	5"x3"x5/16" L		2	81.7	8.2	0.60	10.91	6.53	0.00	0.00
Main Deck Long. Girder	12"x5"x3/8" Flg Plt		1	50.0	21.70	0.48	10.55	5.11	9.40	4.55
Main Deck Transv. Girder	10"x5"x3/8" Flg Plt		1	64.5	21.70	0.62	10.60	6.62	9.40	5.87
Main Deck Long. Girder	10"x4"x3/8" Flg Plt		1	23.3	17.87	0.19	10.75	2.00	40.23	7.49
Main Deck Transv. Girder	8"x4"x3/8" Flg Plt		1	32.5	15.32	0.22	10.82	2.41	40.23	8.94
SPONSON GUARD										
Sponson Guard	1"		2	86.7	40.84	3.16	10.91	34.47	0.879	2.78
MISCELANEOUS										
BOW THRUSTER INSERT PLT	5/8"		2	5.3	25.53	0.12	3.00	0.36	-38.1	-4.61
STRN TB DBLR PLT	3/4"		2	22.6	30.63	0.62	3.80	2.35	26.91	16.65
STRUT INSERT PLT	3/4"		2	46.4	30.63	1.27	4.75	6.03	41.09	52.15
DEEP FLOORS & WT BHDS										
FR 0 NC Frame	7/16" PLT		1	16.2	17.87	0.13	12.00	1.55	-50.6	-6.53
FR 0 Stiffners	3"x5/16" F.B.		1	23.8	3.19	0.03	12.50	0.42	-50.6	-1.72
FR 1 NC Frame	7/16" PLT		1	29.0	17.87	0.23	11.50	2.66	-48.1	-11.12

D-367 Weight Estimate Date: 5/3/22 By: KVC

Steel Below Main Deck

Item Location	Size		#	Area/ Length (ft^2)	Unit Weight (lb)	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
FR 1 Stiffners	3"x5/16" F.B.		1	31.9	3.19	0.05	12.00	0.55	-48.1	-2.19
FR 2 DF	1/4" PLT		1	61.4	10.21	0.28	10.50	2.94	-45.6	-12.76
FR 2 Stiffners	3"x5/16" F.B.		1	5.0	3.19	0.01	11.50	0.08	-45.6	-0.32
FR 2 Stiffners	3x2x1/4" L		1	22.3	4.1	0.04	10.00	0.41	-45.6	-1.86
FR 4 WT BHD	5/16" PLT		1	101.7	12.76	0.58	9.07	5.26	-40.6	-23.52
FR 4 Stiffners	3x2x1/4" L		1	13.0	4.1	0.02	10.10	0.24	-40.6	-0.97
FR 4 Stiffners	4x3x5/16" L		1	25.0	4.1	0.05	7.20	0.33	-40.6	-1.86
FR 4 Stiffners	3"x5/16" F.B.		1	5.7	3.19	0.01	11.24	0.09	-40.6	-0.33
FR 6 DF	1/4" PLT		1	133.6	10.21	0.61	8.45	5.14	-35.6	-21.68
FR 6 Stiffners	3"x5/16" F.B.		2	2.6	4.1	0.01	11.10	0.11	-35.6	-0.34
FR 6 Stiffners	3x2x1/4" L		2	28.7	4.1	0.11	9.00	0.95	-35.6	-3.74
FR 8 WT BHD	1/4" PLT		1	162.0	10.21	0.74	7.95	5.87	-30.6	-22.60
FR 8 Stiffners	3"x5/16" F.B.		2	4.3	3.19	0.01	10.92	0.13	-30.6	-0.37
FR 8 Stiffners	3x2x1/4" L		2	34.8	4.1	0.13	7.42	0.94	-30.6	-3.89
FR 10 DF	1/4" PLT		1	187.2	10.21	0.85	7.53	6.42	-25.6	-21.84
FR 10 Stiffners	3"x5/16" F.B.		2	2.8	3.19	0.01	10.65	0.08	-25.6	-0.20
FR 10 Stiffners	3x2x1/4" L		2	42.4	4.1	0.16	7.00	1.09	-25.6	-3.97
FR 10 SQ Bar @ Cut Outs	3/4" Square Bar		2	1.5	1.913	0.00	4.80	0.01	-25.6	-0.07
FR 12 DF	1/4" PLT		1	208.8	10.21	0.95	7.18	6.83	-20.6	-19.60
FR 12 Stiffners	3"x5/16" F.B.		2	4.0	3.19	0.01	10.36	0.12	-20.6	-0.23
FR 12 Stiffners	3x2x1/4" L		2	46.1	4.1	0.17	6.80	1.15	-20.6	-3.48
FR 12 SQ Bar @ Cut Outs	3/4" Square Bar		2	1.5	1.913	0.00	4.36	0.01	-20.6	-0.05
FR 14 WT BHD	5/16" PLT		2	63.1	12.76	0.72	6.27	4.50	-15.6	-11.21
FR 14 WT BHD	1/4" PLT		2	50.3	10.21	0.46	7.66	3.51	-15.6	-7.15
FR 14 Stiffners	3"x5/16" F.B.		2	1.5	3.19	0.00	10.37	0.04	-15.6	-0.07
FR 14 Stiffners	3x2x1/4" L		2	11.5	4.1	0.04	8.50	0.36	-15.6	-0.66
FR 14 Stiffners	4x3x1/4" L		2	8.5	5.8	0.04	6.80	0.30	-15.6	-0.69
FR 14 Stiffners	4x3x5/16" L		2	19.9	7.2	0.13	6.00	0.77	-15.6	-2.00
FR 16 DF BHD	5/16" PLT		2	63.8	12.76	0.73	6.10	4.43	-10.6	-7.70

D-367 Weight Estimate Date: 5/3/22 By: KVC

Steel Below Main Deck

Item Location	Size		#	Area/ Length (ft^2)	Unit Weight (lb)	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
FR 16 DF BHD	1/4" PLT		2	56.6	10.21	0.52	7.28	3.76	-10.6	-5.47
FR 16 Stiffners	3"x5/16" F.B.		2	2.0	3.19	0.01	10.00	0.06	-10.6	-0.06
FR 16 Stiffners	3x2x1/4" L		2	22.2	4.1	0.08	7.00	0.57	-10.6	-0.86
FR 16 Stiffners	4x3x5/16" L		2	20.2	7.2	0.13	5.50	0.71	-10.6	-1.37
FR 16 SQ Bar @ Cut Outs	3/4" Square Bar		4	1.5	1.913	0.01	4.45	0.02	-10.6	-0.05
FR 18 DF BHD	5/16" PLT		2	43.7	12.76	0.50	5.87	2.92	-5.6	-2.79
FR 18 DF BHD	1/4" PLT		2	81.4	10.21	0.74	6.81	5.05	-5.6	-4.16
FR 18 Stiffners	3"x5/16" F.B.		2	2.9	3.19	0.01	9.36	0.08	-5.6	-0.05
FR 18 Stiffners	3x2x1/4" L		2	33.7	4.1	0.12	6.60	0.81	-5.6	-0.69
FR 18 Stiffners	4x3x5/16" L		2	21.0	7.2	0.14	5.66	0.76	-5.6	-0.76
FR 18 SQ Bar @ Cut Outs	3/4" Square Bar		4	1.5	1.913	0.01	5.36	0.03	-5.6	-0.03
FR 20 WT BHD	5/16" PLT		1	86.9	12.76	0.50	6.00	2.97	-0.6	-0.30
FR 20 WT BHD	1/4" PLT		2	83.4	10.21	0.76	6.16	4.68	-0.6	-0.46
FR 20 Stiffners	3"x5/16" F.B.		2	3.4	3.19	0.01	9.09	0.09	-0.6	-0.01
FR 20 Stiffners	3x2x1/4" L		2	7.3	4.1	0.03	7.01	0.19	-0.6	-0.02
FR 20 Stiffners	4x3x1/4" L		2	24.9	5.8	0.13	6.33	0.82	-0.6	-0.08
FR 20 Stiffners	4x3x5/16" L		2	18.1	7.2	0.12	5.58	0.65	-0.6	-0.07
FR 28 WT BHD	5/16" PLT		1	96.4	12.76	0.55	6.25	3.43	19.4	10.65
FR 28 WT BHD	1/4" PLT		2	69.9	10.21	0.64	7.00	4.46	19.4	12.36
FR 28 WT BHD	1/2" PLT		2	4.5	20.42	0.08	3.10	0.26	19.4	1.61
FR 28 Stiffners	3"x5/16" F.B.		2	2.7	3.19	0.01	9.28	0.07	19.4	0.15
FR 28 Stiffners	3x2x1/4" L		2	6.8	4.1	0.02	7.17	0.18	19.4	0.48
FR 28 Stiffners	4x3x1/4" L		2	22.3	5.8	0.12	6.91	0.80	19.4	2.24
FR 28 Stiffners	4x3x5/16" L		2	19.8	7.2	0.13	6.12	0.78	19.4	2.46
FR 30 DF BHD	5/16" PLT		1	71.1	12.76	0.40	6.95	2.81	24.4	9.88
FR 30 DF BHD	1/4" PLT		2	67.9	10.21	0.62	7.00	4.34	24.4	15.11
FR 30 SQ Bar @ Cut Outs	3/4" Square Bar		4	1.5	1.913	0.01	6.00	0.03	24.4	0.13
FR 30 Stiffners	3"x5/16" F.B.		2	1.9	3.19	0.01	9.72	0.05	24.4	0.13
FR 30 Stiffners	3x2x1/4" L		2	27.1	4.1	0.10	7.00	0.69	24.4	2.42

D-367 Weight Estimate Date: 5/3/22 By: KVC

Steel Below Main Deck

Item Location	Size		#	Area/ Length (ft^2)	Unit Weight (lb)	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
FR 30 Stiffners	4x3x1/4" L		2	16.6	5.8	0.09	7.00	0.60	24.4	2.10
FR 32 DF BHD	1/4" PLT		1	184.8	10.21	0.84	7.25	6.11	29.4	24.76
FR 32 Stiffners	3"x5/16" F.B.		2	1.6	3.19	0.00	9.91	0.05	29.4	0.14
FR 32 Stiffners	3x2x1/4" L		2	43.6	4.1	0.16	7.50	1.20	29.4	4.70
FR 32 SQ Bar @ Cut Outs	3/4" Square Bar		4	1.5	1.913	0.01	6.91	0.04	29.4	0.15
FR 34 WT BHD	1/4" PLT		2	79.8	10.21	0.73	7.87	5.72	34.4	25.01
FR 34 Stiffners	3"x5/16" F.B.		2	1.4	3.19	0.00	10.04	0.04	34.4	0.14
FR 34 Stiffners	4x3x1/4" L		2	34.5	5.8	0.18	8.15	1.46	34.4	6.15
FR 39 DF BHD	1/4" PLT		2	39.4	10.21	0.36	7.25	2.60	29.4	10.55
FR 39 Stiffners	3"x5/16" F.B.		2	2.9	3.19	0.01	9.91	0.08	29.4	0.24
Stiffner Brackets	1/4" PLT		1	48.0	10.21	0.22	10.75	2.35	1	0.22
OTHER - Transv Frames & Foundation										
Steering Foundation	1/2" PLT		1	72.59	20.42	0.66	8.54	5.65	43.77	28.96
Steering Foundation	4"x3/8" F.B.		1	37.50	5.11	0.09	8.33	0.71	43.77	3.74
Steering Foundation	3-1/2 x3-1/2"x5/16 BOX		4	2.00	12.70	0.05	7.38	0.33	41.4	1.88
Steering Foundation	1/4" PLT NT CL Support		1	15.93	10.21	0.07	7.50	0.54	43.7	3.17
Stem FWD	1 1/2" PLT		1	49.37	61.26	1.35	1.39	1.88	-20.6	-27.81
Stem Aft	1 1/2" PLT		1	35.96	61.26	0.98	1.95	1.92	30.0	29.49
Shoe	6"x 1" F.B.		1	70.55	40.84	1.29	-0.34	-0.44	1.497	1.93
CVK Web	5/16" PLT		1	114.19	12.76	0.65	2.04	1.33	-0.366	-0.24
CVK Rider	6"x3/4" F.B.		1	94.00	30.63	1.29	2.67	3.43	-0.366	-0.47
FR 3 flr	5/16" PL w 3"x5/16"FLG		1	3.31	12.76	0.02	3.00	0.06	-43.1	-0.81
FR 3 sponson brkt	5/16" x 3x5/16" FLG		2	9.76	12.76	0.11	11.4	1.27	-43.1	-4.79
FR 3 Side stiff	5x3x5/16" L		2	0.14	8.2	0.00	7.5	0.01	-43.1	-0.04
Long Bottom Girder FR 10-14	15x4x5/16 FP		1	10	20.20	0.09	3.333	0.30	-20.6	-1.86
Long Bottom Girder FR 16-20	15x4x5/16 FP		1	10	20.20	0.09	2	0.18	-5.6	-0.51
Long Side Girder FR 4-FR 30	10x4x5/16 FP		1	65	14.89	0.43	5.9	2.55	-8.1	-3.50
Long Btm Girder FR 28-FR 38	18x4x5/16 FP		1	24.33	23.39	0.25	4	1.02	31.57	8.02
Long Btm Girder FR 34-FR 38	18x4x5/16 FP		1	9.33	23.39	0.10	6.333	0.62	39.06	3.81

D-367 Weight Estimate Date: 5/3/22 By: KVC

Steel Below Main Deck

Item Location	Size		#	Area/ Length (ft^2)	Unit Weight (lb)	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
FR 5 flr	5/16" PL w 3"x5/16"FLG		1	4.17	12.76	0.02	2.25	0.05	-38.1	-0.90
FR 5 FB Grid	3"x5/16" F.B.		2	5.00	3.19	0.01	3.67	0.05	-38.1	-0.54
FR 5 tunnel brkt	5/16" x 3x5/16" FLG		2	1.00	12.76	0.01	5	0.06	-38.1	-0.43
FR 5 Side stiff	4x3x5/16" L		2	7.25	7.2	0.05	7.29	0.34	-38.1	-1.78
FR 5 sponson bracket	5/16" x 3x5/16" FLG		2	8.81	12.76	0.10	11.15	1.12	-38.1	-3.82
FR 5 Thruster Tunnel	510 mm x 15 mm tunnel		1	10	25.53	0.11	3.67	0.42	-38.1	-4.34
FR 7 flr	5/16" x 3x5/16" FLG		1	3.82	12.76	0.02	1.43	0.03	-33.1	-0.72
FR 7 Btm stiff	6x4x5/16"L		2	4.33	10.3	0.04	3.32	0.13	-33.1	-1.32
FR 7 chine brkt	5/16" x 3x5/16" FLG		2	1.19	12.76	0.01	5.58	0.08	-33.1	-0.45
FR 7 Side stiff	4x3x5/16" L		2	5.33	7.2	0.03	8.37	0.29	-33.1	-1.13
FR 7 sponson bracket	5/16" x 3x5/16" FLG		2	9.24	12.76	0.11	10.88	1.15	-33.1	-3.49
FR 9 flr	5/16" x 3x5/16" FLG		1	5.63	12.76	0.03	1.40	0.04	-28.1	-0.90
FR 9 Btm stiff	6x4x5/16"L		2	4.53	10.3	0.04	3.10	0.13	-28.1	-1.17
FR 9 chine brkt	5/16" x 3x5/16" FLG		2	1.60	12.76	0.02	5.14	0.09	-28.1	-0.51
FR 9 Side stiff	4x3x5/16" L		2	5.58	7.2	0.04	8.03	0.29	-28.1	-1.01
FR 9 sponson bracket	5/16" x 3x5/16" FLG		2	6.90	12.76	0.08	10.71	0.84	-28.1	-2.21
FR 11 flr	5/16" x 3x5/16" FLG		1	8.34	12.76	0.05	1.50	0.07	-23.1	-1.10
FR 11 Btm stiff	6x4x5/16"L		2	4.88	10.3	0.04	1.50	0.07	-23.1	-1.04
FR 11 chine brkt	5/16" x 3x5/16" FLG		2	1.74	12.76	0.02	4.65	0.09	-23.1	-0.46
FR 11 Side stiff	4x3x5/16" L		2	5.71	7.2	0.04	7.71	0.28	-23.1	-0.85
FR 11 sponson bracket	5/16" x 3x5/16" FLG		2	4.58	12.76	0.05	10.6	0.55	-23.1	-1.21
FR 13 flr	5/16" x 3x5/16" FLG		1	9.24	12.76	0.05	1.21	0.06	-18.1	-0.95
FR 13 Btm stiff	6x4x5/16"L		2	4.67	10.3	0.04	2.58	0.11	-18.1	-0.78
FR 13 chine brkt	5/16" x 3x5/16" FLG		2	1.81	12.76	0.02	4.23	0.09	-18.1	-0.37
FR 13 Side stiff	4x3x5/16" L		2	5.83	7.2	0.04	7.4	0.28	-18.1	-0.68
FR 13 sponson bracket	5/16" x 3x5/16" FLG		2	4.27	12.76	0.05	10.33	0.50	-18.1	-0.88
FR 15 flr	5/16" x 3x5/16" FLG		1	11.39	12.76	0.06	1.14	0.07	-13.1	-0.85
FR 15 Btm stiff	6x4x5/16"L		2	4.92	10.3	0.05	2.20	0.10	-13.1	-0.59
FR 15 chine brkt	5/16" x 3x5/16" FLG		2	1.88	12.76	0.02	3.5	0.07	-13.1	-0.28

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Steel Below Main Deck

Item Location	Size		#	Area/ Length (ft^2)	Unit Weight (lb)	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
FR 15 Side stiff	4x3x5/16" L		2	5.94	7.2	0.04	7.17	0.27	-13.1	-0.50
FR 15 sponson bracket	5/16" x 3x5/16" FLG		2	4.10	12.76	0.05	10.25	0.48	-13.1	-0.61
Fuel Oil Tank BHDs	5/16" PLT		1	146.87	12.76	0.84	6.5	5.44	-13.1	-10.96
FO Tank BHD Stiffners	4x3x1/4" L		2	33.0	5.8	0.17	3.00	0.51	-13.1	-2.24
FO Tank BHD Stiffners	4x3x5/16" L		2	20.0	7.2	0.13	7.58	0.98	-13.1	-1.68
FR 17 flr	5/16" x 3x5/16" FLG		1	20.02	12.76	0.11	1.74	0.20	-8.1	-0.92
FR 17 Stiffners	3"x5/16" F.B.		1	3.3	3.19	0.00	1.74	0.01	-8.1	-0.04
FR 17 Btm stiff	6x4x5/16"L		2	4.04	10.3	0.04	2.15	0.08	-8.1	-0.30
FR 17 chine brkt	5/16" x 3x5/16" FLG		2	1.81	12.76	0.02	3.6	0.07	-8.1	-0.17
FR 17 Side stiff	4x3x5/16" L		2	6.04	7.2	0.04	7	0.27	-8.1	-0.31
FR 17 sponson bracket	5/16" x 3x5/16" FLG		2	2.08	12.76	0.02	10.5	0.25	-8.1	-0.19
Sewage Tank BHDs	5/16" PLT		1	111.00	12.76	0.63	6.5	4.11	-9.35	-5.91
Sewage Tank BHD Stiffners	4x3x5/16" L		3	25.3	7.2	0.24	6.00	1.46	-9.35	-2.28
FR 19 flr	5/16" x 3x5/16" FLG		1	13.54	12.76	0.08	1.22	0.09	-3.1	-0.24
FR 19 Girder Brkt	5/16" PLT		4	1.0	3.19	0.01	1.22	0.01	-3.1	-0.02
FR 19 Btm stiff	6x4x5/16"L		2	4.42	10.3	0.04	2.00	0.08	-3.1	-0.13
FR 19 chine brkt	5/16" x 3x5/16" FLG		2	1.81	12.76	0.02	3.4	0.07	-3.1	-0.06
FR 19 Side stiff	4x3x5/16" L		2	6.10	7.2	0.04	6.81	0.27	-3.1	-0.12
FR 19 sponson bracket	5/16" x 3x5/16" FLG		2	1.97	12.76	0.02	10	0.22	-3.1	-0.07
FW Tank BHDs	5/16" PLT		1	121.04	12.76	0.69	7	4.83	-3.1	-2.14
FW Tank BHD Stiffners	4x3x1/4" L		1	9.5	5.8	0.02	7.00	0.17	-3.1	-0.08
FW Tank BHD Stiffners	4x3x5/16" L		8	5.0	7.2	0.13	7.50	0.96	-3.1	-0.40
FR 21 flr	5/16" x 3x5/16" FLG		1	42.92	12.76	0.24	1.50	0.37	1.9	0.46
FR 21 chine brkt	5/16" x 3x5/16" FLG		2	2.08	12.76	0.02	3.25	0.08	1.9	0.05
FR 21 Side stiff	4x3x5/16" L		2	6.08	7.2	0.04	6.7	0.26	1.9	0.07
FR 21 sponson bracket	5/16" x 3x5/16" FLG		2	1.94	12.76	0.02	10	0.22	1.9	0.04
FR 22 flr	5/16" x 3x5/16" FLG		1	35.15	12.76	0.20	1.50	0.30	4.4	0.88
FR 22 Stanchions	4" SCH 80 Pipe		2	6.83	14.9	0.09	6.75	0.61	4.4	0.40
FR 22 Stanchion Pads	1/2" PLT		4	0.79	20.42	0.03	6.75	0.19	4.4	0.13

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Item Location	Size		#	Area/ Length (ft^2)	Unit Weight (lb)	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
FR 22 chine brkt	5/16" x 3x5/16" FLG		2	2.43	12.76	0.03	3.5	0.10	4.4	0.12
FR 22 Brackets	1/4" PLT		3	0.69	10.21	0.01	9.75	0.09	4.4	0.04
FR 22 deep floor	1/4" x 3"x1/4" FLG		2	13.40	10.21	0.12	8.5	1.04	4.4	0.54
FR 22 deep floor stiffner	3"x5/16" F.B.		2	3.58	3.19	0.01	9	0.09	4.4	0.04
FR 23 flr	5/16" x 3x5/16" FLG		1	23.72	12.76	0.14	1.30	0.18	6.9	0.93
FR 23 chine brkt	5/16" x 3x5/16" FLG		2	2.22	12.76	0.03	3.50	0.09	6.9	0.17
FR 23 Side stiff	4x3x5/16" L		2	6.08	7.2	0.04	6.65	0.26	6.9	0.27
FR 23 sponson bracket	5/16" x 3x5/16" FLG		2	1.94	12.76	0.02	9.9	0.22	6.9	0.15
Stair coaming	8"x3/8" F.B.		1	22.92	10.21	0.10	10.78	1.13	6.9	0.72
FR 24 flr	5/16" x 3x5/16" FLG		1	25.40	12.76	0.14	1.75	0.25	9.4	1.36
FR 24 chine brkt	5/16" x 3x5/16" FLG		2	2.33	12.76	0.03	3.50	0.09	9.4	0.25
FR 24 deep floor	1/4" x 3"x1/4" FLG		2	14.24	10.21	0.13	9	1.17	9.4	1.22
FR 24 deep floor stiffner	3"x5/16" F.B.		2	3.42	3.19	0.01	9	0.09	9.4	0.09
FR 24 Brackets	1/4" PLT		4	0.69	10.21	0.01	10.4	0.13	9.4	0.12
FR 25 flr	5/16" x 3x5/16" FLG		1	12.06	12.76	0.07	1.60	0.11	11.9	0.82
FR 25 Btm stiff	6x4x5/16"L		2	6.25	10.3	0.06	2.13	0.12	11.9	0.68
FR 25 chine brkt	5/16" x 3x5/16" FLG		2	1.67	12.76	0.02	3.25	0.06	11.9	0.23
FR 25 Side stiff	4x3x5/16" L		2	6.07	7.2	0.04	6.6	0.26	11.9	0.46
FR 25 sponson bracket	5/16" x 3x5/16" FLG		2	2.01	12.76	0.02	9.9	0.23	11.9	0.27
FR 26 flr	5/16" x 3x5/16" FLG		1	12.50	12.76	0.07	1.80	0.13	14.4	1.03
FR 26 chine brkt	5/16" x 3x5/16" FLG		2	2.08	12.76	0.02	3.75	0.09	14.4	0.34
FR 26 deep floor	1/4" x 3"x1/4" FLG		2	11.94	10.21	0.11	9.25	1.01	14.4	1.57
FR 26 deep floor stiffner	3"x5/16" F.B.		2	3.17	3.19	0.01	9.1	0.08	14.4	0.13
FR 26 Brackets	1/4" PLT		4	0.69	10.21	0.01	6.39	0.08	14.4	0.18
FR 26 Btm stiff	6x4x5/16"L		2	6.25	10.3	0.06	2.25	0.13	14.4	0.83
FR 26 Stanchions	4" SCH 80 Pipe		2	7.33	14.9	0.10	6.39	0.62	14.4	1.40
FR 26 Stanchion Pads	1/2" PLT		4	0.79	20.42	0.03	6.39	0.18	14.4	0.41
FR 27 flr	5/16" x 3x5/16" FLG		1	11.81	12.76	0.07	2.16	0.15	16.9	1.14
FR 27 chine brkt	5/16" x 3x5/16" FLG		2	1.74	12.76	0.02	3.60	0.07	16.9	0.33

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Item Location	Size		#	Area/ Length (ft^2)	Unit Weight (lb)	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
FR 27 sponson bracket	5/16" x 3x5/16" FLG		2	2.08	12.76	0.02	9.75	0.23	16.9	0.40
FR 27 Btm stiff	6x4x5/16"L		2	6.50	10.3	0.06	2.25	0.13	16.9	1.01
FR 27 Side stiff	4x3x5/16" L		2	6.00	7.2	0.04	6.69	0.26	16.9	0.65
FR 27 Brackets	1/4" PLT		2	0.49	10.21	0.00	2.5	0.01	16.9	0.07
FR 29 flr	5/16" x 3x5/16" FLG		1	23.96	12.76	0.14	2.75	0.38	21.9	2.99
FR 29 chine brkt	5/16" x 3x5/16" FLG		2	1.17	12.76	0.01	3.75	0.05	21.9	0.29
FR 29 Side stiff	4x3x5/16" L		2	5.83	7.2	0.04	6.79	0.25	21.9	0.82
FR 29 sponson bracket	5/16" x 3x5/16" FLG		2	2.03	12.76	0.02	10.2	0.24	21.9	0.51
DO/LO/Bilge Tank BHDs	5/16" PLT		1	140.0	12.76	0.80	6.92	5.52	21.9	17.47
DO/LO/Bilge Tk BHD Stiffners	4x3x1/4" L		1	21.7	5.8	0.06	6.92	0.39	21.9	1.23
DO/LO/Bilge Tk BHD Stiffners	3x2x1/4" L		2	4.0	4.1	0.01	6.92	0.10	21.9	0.32
FR 31 flr	5/16" x 3x5/16" FLG		1	20.83	12.76	0.12	3.30	0.39	26.9	3.19
FR 31 Side stiff	4x3x5/16" L		2	5.64	7.2	0.04	6.93	0.25	26.9	0.98
FR 31 sponson bracket	5/16" x 3x5/16" FLG		2	3.99	12.76	0.05	10	0.45	26.9	1.22
FR 31 chine bracket	5/16" x 3x5/16" FLG		2	1.04	12.76	0.01	4.1	0.05	26.9	0.32
FR 33 flr	5/16" x 3x5/16" FLG		1	27.53	12.76	0.16	4.25	0.67	31.9	5.00
FR 33 Side stiff	4x3x5/16" L		2	4.79	7.2	0.03	7.37	0.23	31.9	0.98
FR 33 sponson bracket	5/16" x 3x5/16" FLG		2	3.58	12.76	0.04	5.6	0.23	31.9	1.30
FR 33 floor bracket	5/16" x 3x5/16" FLG		2	1.04	12.76	0.01	10	0.12	31.9	0.38
FR 35 flr	5/16" x 3x5/16" FLG		1	20.53	12.76	0.12	4.89	0.57	36.73	4.30
FR 35 Side stiff	4x3x5/16" L		2	51.20	7.2	0.33	7.71	2.54	36.73	12.09
FR 35 sponson bracket	5/16" x 3x5/16" FLG		2	3.47	12.76	0.04	10	0.40	36.73	1.45
FR 35 floor bracket	1/4" PLT		2	1.04	10.21	0.01	6.25	0.06	36.73	0.35
FR 36 btm flr	5/16" x 3x5/16" FLG		2	12.44	12.76	0.14	5.63	0.80	39.06	5.53
FR 36 floor	1/4" PLT		2	11.17	10.21	0.10	9.40	0.96	39.06	3.98
FR 36 deep floor stiffner	3"x5/16" F.B.		2	5.79	3.19	0.02	9.50	0.16	39.06	0.64
FR 36 Stanchions	4" SCH 80 Pipe		2	4.38	14.9	0.06	8.22	0.48	39.06	2.27
FR 36 Stanchion Pads	1/2" PLT		4	0.79	20.42	0.03	8.22	0.24	39.06	1.12
FR 36 brackets	1/4" PLT		2	1.95	10.21	0.02	8.5	0.15	39.06	0.69

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Item Location	Size		#	Area/ Length (ft^2)	Unit Weight (lb)	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
FR 37 flr	5/16" x 3x5/16" FLG		2	8.87	12.76	0.10	5.60	0.57	41.4	4.18
FR 37 floor	1/4" PLT		2	11.76	10.21	0.11	9.4	1.01	41.4	4.44
FR 37 deep floor stiffner	3"x5/16" F.B.		2	4.00	3.19	0.01	9.93	0.11	41.4	0.47
FR 37 brackets	1/4" PLT		2	2.00	10.21	0.02	8.42	0.15	41.4	0.75
FR 38 CL & Side flr	5/16" x 3x5/16" FLG		2	5.33	12.76	0.06	6.00	0.36	43.73	2.65
FR 38 side stiff	4x3x5/16" L		2	3.64	7.2	0.02	8.2	0.19	43.73	1.02
FR 38 sponson bracket	5/16" x 3x5/16" FLG		2	4.63	12.76	0.05	10.30	0.54	43.73	2.30
FR 38 bracket	1/4" PLT		2	0.69	10.21	0.01	6.85	0.04	43.73	0.28
Struts	2" PLT		2	10.50	81.68	0.77	4.00	3.06	39.06	29.91
Stern Tube	12"OD x 8" ID Mech Tube		2	5.62	490	2.46	5.75	14.13	24.4	59.95
Strut Barrel	12"OD x 8" ID Mech Tube		2	0.74	490	0.32	2.25	0.73	39.06	12.65
Skeg	3/8" PLT		4	77.6	15.32	2.12	1.00	2.12	28.17	59.80
Engine Foundation Web	1/2" PLT		2	74.24	20.42	1.35	2.17	2.94	6.5	8.80
Engine Foundation Rider	1" PLT		2	22.76	40.84	0.83	3.00	2.49	9.4	7.80
Engine Foundation Brackets	5/16" PLT		14	2.00	12.76	0.16	1.80	0.29	9.4	1.50
Skeg Bracket FR 24	5/16" PLT		2	0.17	12.76	0.00	0.00	0.00	9.4	0.02
Skeg Bracket FR 25	5/16" PLT		2	0.29	12.76	0.00	0.00	0.00	11.9	0.04
Skeg Bracket FR 26	5/16" PLT		1	0.94	12.76	0.01	0.25	0.00	14.4	0.08
Skeg Bracket FR 27	5/16" PLT		1	1.33	12.76	0.01	0.33	0.00	16.9	0.13
Skeg Bracket FR 28	5/16" PLT		1	1.85	12.76	0.01	0.50	0.01	19.4	0.20
Skeg Bracket FR 29	5/16" PLT		1	2.35	12.76	0.01	0.67	0.01	21.9	0.29
Skeg Bracket FR 30	5/16" PLT		1	2.88	12.76	0.02	1.00	0.02	24.4	0.40
Skeg Bracket FR 31	5/16" PLT		1	3.38	12.76	0.02	1.25	0.02	26.9	0.52
Skeg Bracket FR 32	5/16" PLT		1	4.01	12.76	0.02	1.50	0.03	29.4	0.67
Skeg Bracket FR 33	5/16" PLT		1	3.94	12.76	0.02	1.67	0.04	31.9	0.72
Skeg Bracket FR 34	5/16" PLT		1	3.72	12.76	0.02	2.00	0.04	34.4	0.73
Skeg Bracket FR 35	5/16" PLT		1	1.76	12.76	0.01	2.50	0.03	36.73	0.37
Tonnage Frames at Stern	5/16" PLT		1	83.0	12.76	0.47	9.17	4.33	48.35	22.86
Tonnage Frames Stiffner	3x2x1/4" L		7	4.0	4.1	0.05	9.17	0.47	50	2.56

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Steel Below Main Deck

Item Location	Size		#	Area/ Length (ft^2)	Unit Weight (lb)	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
Rudder Port	9-1/4"ODx2"Wall Tube		2	0.69	490	0.30	6.67	2.01	43.73	13.19
Rudder Port Brackets	3/8" PLT		1	14.5	15.32	0.10	6.67	0.66	43.73	4.34
Item						Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
TOTAL STEEL BELOW MAIN DECK						**94.3**	**6.78**	**639**	**2.923**	**276**

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Steel Above Main Deck

Item Location	Size	#	Area/ Length	Unit Weight	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
SUPERSTRUCTURE									
Long. BHDs 15 & 18	1/4" PLT	2	519.0	10.21	4.73	16.23	76.77	1.45	6.88
BHD Stiffners	3"x2"x1/4" L	2	213.4	4.1	0.78	14.83	11.59	14.38	11.24
BHD Stiffners	3"x3"x3/8" L	2	100.5	7.2	0.65	20.17	13.02	-15.50	-10.01
BHD Stiffners	3"x1/4" F.B.	2	274.0	2.55	0.62	13.17	8.22	-24.00	-14.99
Stiffner Brackets	1/4" PLT	66	0.5	10.21	0.15	19.00	2.86	1.45	0.22
BHD Stiffners	3"x1/2" F.B.	1	90.0	5.11	0.21	15.17	3.11	34.45	7.07
Fashion Plate Cap	3"x1/4" F.B.	2	8.4	2.55	0.02	22.70	0.44	-9.50	-0.18
Fashion Plate Cap	11"x1/4" F.B.	1	66.9	9.36	0.28	26.30	7.35	-7.50	-2.10
Fashion Plate Cap	12"x1/4" w/3x1/4 Flg	2	13.4	12.76	0.15	26.57	4.05	-21.71	-3.31
Fashion Plate Cap	4"x3/8" F.B.	2	29.3	5.11	0.13	16.50	2.20	8.00	1.07
Fashion Plate Cap	2"x5/16" F.B.	2	7.6	2.13	0.01	22.70	0.33	-9.50	-0.14
Stack	1/4" PLT	2	64.79	10.21	0.59	23	13.58	6.33	3.74
Stack Stiffner	3"x2"x1/4" L	1	66.42	4.1	0.12	23	2.80	6.33	0.77
Stack Stiffner	3"x1/4" F.B.	1	22.5	2.55	0.03	24.5	0.63	5.00	0.13
Stack Fwd/Aft BHDs	1/4" PLT	1	73.6	10.21	0.34	23	7.71	6.33	2.12
Stack Top Coaming	3/4" Round Bar	1	18.7	1.50	0.01	27.33	0.34	5.00	0.06
Long. BHDs 8 & 4	1/4" PLT	1	495.8	10.21	2.26	16.32	36.87	6.88	15.55
BHD Stiffners	3"x2"x1/4" L	31	8.0	4.1	0.45	15.00	6.81	6.88	3.12
Long. BHDs 5 & 3	1/4" PLT	1	325.7	10.21	1.48	15.16	22.50	4.33	6.43
BHD Stiffners	3"x2"x1/4" L	21	8.0	4.1	0.31	15.00	4.61	4.33	1.33
BHD Stiffners	3"x1/4" F.B.	1	31.9	2.55	0.04	14.00	0.51	13.00	0.47
Long. BHD 14	3/16" PLT	1	40.7	7.66	0.14	15.21	2.12	16.90	2.35
BHD Stiffners BHD 14	3"x2"x1/4" L	2	8.0	4.1	0.03	15.00	0.44	16.90	0.49
Long. BHD 6	1/4" PLT	1	76.8	10.21	0.35	15.20	5.32	10.94	3.83
BHD Stiffners BHD 6	3"x2"x1/4" L	7	8.0	4.1	0.10	15.25	1.56	10.94	1.12
Transv. BHD 16	3/8" PLT	1	37.7	15.32	0.26	15.25	3.93	33.23	8.56
BHD Stiffners BHD 16	3"x2"x1/4" L	3	7.0	4.1	0.04	15.25	0.59	33.23	1.28
Davit Support	8"x33.5# I-T	1	3.3	33.5	0.05	18.70	0.93	32.73	1.63
Davit Support	5/8" PLT	1	11.8	25.53	0.13	18.50	2.49	33.23	4.47

D-367 Weight Estimate Date: 5/10/22 By: KVC

Steel Above Main Deck

Item Location	Size	#	Area/ Length	Unit Weight	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
Transv. BHD 2	1/4" PLT	1	8.1	10.21	0.04	15.21	0.56	-19.60	-0.73
BHD Stiffners BHD 2	3"x1/4" F.B.	1	2.9	2.55	0.00	15.00	0.05	-19.60	-0.07
Long. BHD 10	1/4" PLT	1	112.6	10.21	0.51	15.00	7.70	-13.70	-7.03
BHD Stiffners BHD 10	3"x2"x1/4" L	8	8.0	4.1	0.12	15.25	1.79	-13.70	-1.60
Transv. BHD 12	3/16" PLT	1	10.5	7.66	0.04	16.50	0.59	-6.59	-0.24
BHD Stiffners BHD 12	3"x1/4" F.B.	1	2.9	2.55	0.00	16.00	0.05	-6.59	-0.02
Transv. BHD 11	1/4" PLT	1	24.9	10.21	0.11	16.50	1.87	33.40	3.79
BHD Stiffners BHD 11	3"x1/4" F.B.	1	21.5	2.55	0.02	16.00	0.39	33.40	0.82
Transv. BHD 13	1/4" PLT	1	26.7	10.21	0.12	15.25	1.85	7.90	0.96
BHD Stiffners BHD 13	3"x2"x1/4" L	1	8.0	4.1	0.01	15.00	0.22	7.90	0.12
Transv. BHD 1	1/4" PLT	1	53.1	10.21	0.24	15.25	3.69	-19.60	-4.74
BHD Stiffners BHD 1	3"x2"x1/4" L	3	8.0	4.1	0.04	15.00	0.66	-19.60	-0.86
Long. BHD 7	1/4" PLT	1	50.1	10.21	0.23	15.00	3.42	4.77	1.09
BHD Stiffners BHD 7	3"x2"x1/4" L	2	8.0	4.1	0.03	15.00	0.44	4.77	0.14
Long. BHD 9	1/4" PLT	1	97.5	10.21	0.44	15.00	6.66	27.40	12.17
BHD Stiffners BHD 9	3"x2"x1/4" L	7	8.0	4.1	0.10	15.25	1.56	27.40	2.81
Transv BHD FR 13.5	3/16" PLT	1	26.3	7.66	0.09	15.00	1.35	-16.94	-1.53
BHD Stiffners FR 13.5	3"x2"x1/4" L	1	8.0	4.1	0.01	15.21	0.22	-16.94	-0.25
Transv BHD FR 17	1/4" PLT	1	12.0	10.21	0.05	15.00	0.82	-8.10	-0.44
Transv BHD FR 21&22	1/4" PLT	1	53.3	10.21	0.24	15.21	3.70	3.02	0.73
Transv BHD FR 22.5	3/16" PLT	1	40.7	7.66	0.14	15.00	2.09	5.23	0.73
BHD Stiffners FR 22.5	3"x2"x1/4" L	2	8.0	4.1	0.03	15.00	0.44	5.23	0.15
BHD Stiffners FR 21&22	3"x2"x1/4" L	1	8.0	4.1	0.01	15.00	0.22	3.02	0.04
Transv BHD FR 29	1/4" PLT	1	21.3	10.21	0.10	15.00	1.46	21.24	2.07
PH Long. BHDs	1/4" PLT	2	64.0	10.21	0.58	31.00	18.07	-13.00	-7.58
BHD Stiffners	3"x2"x1/4" L	7	8.0	4.1	0.10	29.50	3.02	-13.00	-1.33
PH Front BHD	1/4" PLT	1	72.3	10.21	0.33	30.00	9.89	-19.25	-6.34
BHD Stiffners	3"x2"x1/4" L	1	49.7	4.1	0.09	29.00	2.64	-19.25	-1.75
BHD Stiffners	5"x5/16" F.B.	1	13.0	5.32	0.03	30.30	0.93	-19.25	-0.59
PH Front Window Spigot	2" x 2" x 1/4" L	1	38.0	3.19	0.05	32.28	1.75	-19.25	-1.04

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Steel Above Main Deck

Item Location	Size	#	Area/ Length	Unit Weight	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
PH Aft BHD	1/4" PLT	1	72.3	10.21	0.33	30.00	9.89	-6.94	-2.29
BHD Stiffners	3"x2"x1/4" L	1	49.7	4.1	0.09	29.00	2.64	-6.94	-0.63
01 Deck Stanchions	3" SCH 40	8	6.5	7.58	0.18	22.75	4.00	-12.25	-2.16
01 Deck Stanchion Base	1/2" PLT	16	0.5	20.42	0.07	22.75	1.66	-12.25	-0.89
BULWARK									
Main deck bulwark fwd	1/4" PLT	2	91.7	10.21	0.84	12.75	10.65	-41.0	-34.26
Bulwark stiffners	3"x1/4" F.B.	22	1.25	3.19	0.04	12.75	0.50	-41.00	-1.61
Bulwark Cap	4" x 3/8" F.B.	2	24.17	5.25	0.11	15.00	1.70	-41.00	-4.65
Main deck bulwark aft	1/4" PLT	2	28.3	10.21	0.26	12.75	3.29	44.5	11.50
Bulwark stiffners	3"x1/4" F.B.	8	1.16	3.19	0.01	12.75	0.17	44.50	0.59
Bulwark Cap	4" x 3/8" F.B.	2	8.58	5.25	0.04	14.32	0.58	44.50	1.79
Bulwark Posts Fwd	6" SCH 80 Pipe	2	3.33	28.60	0.09	13.40	1.14	-48.50	-4.13
Bulwark Posts Aft	6" SCH 80 Pipe	2	3.33	28.60	0.09	12.67	1.08	47.88	4.08
Anchor Rest	1/2" PLT	1	1.00	75.00	0.03	13.00	0.44	-34.50	-1.16
DECK PLATE									
01 Deck Plate Stbd	1/4" PLT	1	393.8	10.21	1.795	19.17	34.41	7.1	12.79
01 Deck Plate Port	1/4" PLT	1	343.8	10.21	1.567	19.17	30.04	8.2	12.88
01 Deck Plate Port	3/4" PLT	1	42.9	30.63	0.587	19	11.16	33.7	19.77
0 Deck Davit Support	8"x4"x5/16" Flg Plt	1	18.1	12.76	0.103	19.17	1.98	34.4	3.55
01 Deck Stiffners	2" x 2" x 1/4" L	1	436.1	3.19	0.621	19	11.80	8.5	5.28
01 Deck Stiffners	2" x 1/4" F.B.	3	2.3	1.70	0.005	19.05	0.10	35.52	0.18
PH Deck Plate	1/4" PLT	1	421.2	10.21	1.920	27	51.84	-13.44	-25.80
PH Deck Stiffners	2-1/2"x3/8" F.B.	1	208.3	3.19	0.297	26.91	7.99	-13.50	-4.01
PH Deck Girder	11x3x5/16" Flg Plt	2	26.8	14.89	0.356	26.5	9.44	-17.50	-6.24
PH Deck Girder	10x3x1/4" Flg Plt	1	26.8	12.76	0.153	26.5	4.05	-10.60	-1.62
PH Deck Girder	8x3x1/4" Flg Plt	1	17.5	12.76	0.100	26.5	2.64	-5.60	-0.56
PH Deck Brackets	3/8" PLT	12	1.0	15.32	0.082	26.75	2.20	-20.60	-1.69
PH Top	1/4" PLT	1	247.4	10.21	1.128	35	39.47	-12.15	-13.70
PH Top Stiffners	2x2x1/4" L	7	13.0	3.19	0.130	34.9	4.52	-11.67	-1.51
PH Top Deck Girder	5"x11# I-T	2	12.5	11	0.122	35.8	4.38	-12.50	-1.53

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Steel Above Main Deck

Item Location	Size	#	Area/ Length	Unit Weight	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
PH Top Brackets	1/4" PLT	21	0.7	10.21	0.066	34.5	2.29	-12.15	-0.81
PH Top Deck Cap	3/4" Round Bar	1	65.9	1.502	0.044	36.8	1.63	-11.50	-0.51
Item					Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
TOTAL SUPERSTRUCTURE STEEL					**29.7**	**19.53**	**579.4**	**0.18**	**5.4**

D-367 Weight Estimate Date: 5/13/22 By: KVC

Joiner

Item	Material	Area/ Length	Unit Weight	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
SHEATHING & PARTITIONS								
Main Deck Bulkheads		2100	1.64	1.54	14.80	22.73	7.41	11.4
Pilot House Bulkheads		397.1	1.64	0.29	29.25	8.50	-13.02	-3.78
INSULATION								
Main Deck Bulkheads - Thermal	J-M 2" Microblanket	345	2.9	0.45	14.80	6.61	7.41	3.31
Pilot House Bulkheads - Thermal	J-M 2" Microblanket	57.9	2.9	0.07	29.25	2.19	-13.02	-1.0
E.R. Overhead	1" Soundown CGFG board	570	2	0.51	11.31	5.76	9.40	4.78
Uptake BHDs	2" Soundown CGFG foam	150	2	0.13	17.00	2.28	7.71	1.0
ER fan/escape	Soundown Quiet Core panel	82.0	2	0.07	15.40	1.13	4.75	0.35
Item				Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
TOTAL JOINER				**3.1**	**16.1**	**49.2**	**5.3**	**16.1**

D-367 Weight Estimate Date: 5/12/22 By: KVC

Hull Outfit

Item	#	Area/ Length	Unit Weight	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
LINE HANDLING & ANCHOR								
Anchor	1	1	500	0.22	8.50	1.90	-35.00	-7.81
Anchor Rode Drum	1	1	300.0	0.13	9	1.21	-33.50	-4.49
Rope 1 1/2" Cortland Co-Polymere 12 Plaited	1	235	0.6	0.06	12	0.72	-34.00	-2.03
Chain 3/4" Stud Link Galvanized	1	32	5.5	0.08	9	0.71	-34	-2.67
Chain Rode Tray - 5/16" PLT	1	13.25	12.76	0.08	12.75	0.96	-34	-2.57
10" SCH 40 Hawse Pipe	1	4	40.48	0.07	9	0.65	-34	-2.46
BOLLARDS, BITTS, CLEATS, CHOCKS								
24" Kevel Chock Main Deck	6	1	98	0.26	15	3.94	-6.69	-1.76
Hawse Pipe	8	2.25	15.9	0.13	16.5	2.11	-6	-0.77
24" Kevel Chock 01 Deck	2	1	98	0.09	20	1.75	0.33	0.03
RAILINGS								
1-1/2" SCH 40 Pipe - Pilot House Deck	1	282.6	2.72	0.34	28.4	9.75	-12.83	-4.40
2" Sch 40 Pipe - Pilot House Deck	1	163.2	3.65	0.27	29	7.71	-12.83	-3.41
1-1/2" SCH 40 Pipe - 01 Deck	1	209.0	2.72	0.25	20	5.08	8	2.03
2" Sch 40 Pipe - 01 Deck	1	300.0	3.65	0.49	22	10.75	8	3.91
Steel Mesh-McNichols 2" S.S. Woven Mesh	1	400	1.8	0.32	21	6.75	8	2.57
Stair Railings	2	46.17	3	0.12	18	2.23	0	0.00
RUDDER								
Blades	2	1.0	850	0.76	2.5	1.90	43.75	33.20
Rudder Stock	2	5.0	81	0.36	7.5	2.70	43.75	15.78
LIFE SAVING								
100 Person IBA Liferafts	2	1	794	0.71	20.25	14.36	29.00	20.56
PFD Box	2	1	40	0.04	14.00	0.50	12.00	0.43
190 Adult Life Jackets	190	1	2	0.17	20.25	3.44	6.40	1.09
15 Child Life Jackets	15	1	2	0.01	12.75	0.17	19.50	0.26
Fire Station Hold	2	1	75	0.07	7.00	0.47	0.00	0.00
Fire Station Main Deck	2	1	75	0.07	15.50	1.04	2.17	0.14
Fire Station 01 Deck	2	1	75	0.07	23.25	1.56	-1.53	-0.10
Life Ring	4	1	5	0.01	15.00	0.13	0.00	0.00

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Hull Outfit

Item	#	Area/ Length	Unit Weight	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
AED	1	1	10	0.00	16.00	0.07	27.50	0.12
Rescue Boat & Cradle	1	1	1190	0.53	21.00	11.16	20.50	10.89
Rescue Boat Davit	1	1	2800	1.25	22.50	28.13	32.50	40.63
Portable Fire Extinguishers	10	1	20	0.09	15.00	1.34	5.00	0.45
LADDERS & STAIRS								
Ladders Below Deck - Round Bar and Flat Bar	9	1.00	100.00	0.40	8.00	3.21	0	0.00
ER Stair C8x11.5#	2	9.5	11.50	0.098	8	0.78	10.00	0.98
ER Stair Tread 10x1x1/4" FP	9	1.5	9.36	0.056	8	0.45	10.00	0.56
PH Stairs C8x11.5#	4	9.5	11.50	0.195	22.77	4.44	-7.71	-1.50
PH Stair Tread 10x1x1/4" FP	20	1.5	9.36	0.125	22.77	2.85	-7.71	-0.97
PH Roof Ladder Bar	1	1.0	100.00	0.045	32.5	1.45	-6.25	-0.28
Stair Treads - 1/4" PLT	27	3.0	10.21	0.37	15.50	5.72	-6.46	-2.38
Stair Foundation - 1/4" PLT	1	50.0	10.21	0.23	15.50	3.53	-6.46	-1.47
DOORS, WINDOWS, & HATCHES								
Main Deck Hatches	9	1	78	0.31	11.50	3.60	0.00	0.00
Tank Hatches	6	1	50	0.13	10.00	1.34	0.00	0.00
36" x 34" Thermopane window	2	1	52.50	0.05	32.25	1.51	-9.85	-0.46
25" x 15.5" x 34" Thermopane window	2	1	80.83	0.07	32.25	2.33	-16.50	-1.19
42" x 34" Thermopane Heated Window	6	1	163.75	0.44	32.25	14.15	-13.25	-5.81
48" x 34" Thermopane Window	13	1	180.00	1.04	17.00	17.76	7.00	7.31
34" x 34" Thermopane Window	2	1	130.42	0.12	17.00	1.98	27.00	3.14
Weathertight Door - 28" x 80" PH	2	1	150	0.13	30.25	4.05	-13.25	-1.77
Weathertight Door - 36" x 80"	4	1	150	0.27	15.50	4.15	10.00	2.68
Steel Joiner Door - 24" x 80"	1	1	72	0.03	15.50	0.50	-6.60	-0.21
Steel Joiner Door - 28" x 80"	1	1	82	0.04	15.50	0.57	1.40	0.05
Weathertight Door - 30" x 72"	1	1	350	0.16	15.50	2.42	15.25	2.38
Steel Joiner Door - 36" x 80"	1	1	100	0.04	15.50	0.69	-12.02	-0.54
Double Weathertight Door - 42" x 60"	1	1	150	0.07	15.50	1.04	23.83	1.60
Weathertight Door - 28" x 80"	1	1	150	0.07	15.50	1.04	-19.60	-1.31
FLOOR PLATES & CATWALKS								

D-367 Weight Estimate Date: 5/12/22 By: KVC

Hull Outfit

Item	#	Area/ Length	Unit Weight	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
Engine Room - Patterned Steel	1	377.3	5.25	0.88	3.75	3.32	9.33	8.25
Engine Room - Floor Plate Frame	1	151.6	2	0.14	3.75	0.51	9.33	1.26
Steering Gear Comp - Steel Diamond Plate w/ frame	1	130	4	0.23	6.33	1.47	38.12	8.84
Thruster Room - Steel Diamond Plate w/ frame	1	97.1	4	0.17	4.75	0.82	-34.15	-5.92
Tank Void Fwd - Steel Diamond Plate w/ frame	1	120.1	4	0.21	3.00	0.64	-7.54	-1.62
Tank Void Aft - Steel Diamond Plate w/ frame	2	15.1	4	0.05	4.17	0.22	21.90	1.18
MISC.								
Tie-Downs	20	1	22	0.20	12.00	2.36	-18.00	-3.54
Safety Grating for open hatches	2	1	10	0.01	11.75	0.10	-18.00	-0.16
Cargo Net	2	1	40	0.04	12.50	0.45	-17.75	-0.63
Item				Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
TOTAL OUTFIT				**13.5**	**15.8**	**212.6**	**8.022**	**108.1**

D-367 Weight Estimate Date: 5/13/22 By: KVC

Bow Door & Aft Vehicle Gate

Item	#	Area/ Length	Unit Weight	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
Main Plate 3/8"	2	109.0	15.32	1.491	16.00	23.86	-50.75	-75.68
Stiffners - 6"x12.5# I-T	6	11.8	12.50	0.395	15.83	6.25	-50.50	-19.95
4"x3/8" F.B.	4	18.2	5.11	0.166	16.00	2.65	-50.75	-8.41
2-1/2"x3/8" F.B.	2	18.2	3.19	0.052	15.83	0.82	-50.75	-2.63
1-1/2" PLT Pad	8	0.8	61.26	0.164	15.25	2.50	-50.75	-8.33
1/2" PLT Pad	1	20.0	20.84	0.186	15.83	2.95	-50.50	-9.40
Dog	3	1	30	0.040	15.83	0.64	-50.75	-2.04
Misc. Pins, Nut, Bolts	1	50	2	0.045	15.25	0.68	-50.75	-2.27
Aft Vehicle Gate-Grade 100 Chain	1	15	2	0.016	13.00	0.21	49.00	0.80
Aft Vehicle Gate - 3" Sch 160	3	3	14	0.064	13.00	0.83	49.00	3.13
Item				Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
TOTAL BOW DOOR & AFT VEHICLE GATE				**2.6**	**15.8**	**41.4**	**-47.6**	**-124.8**

D-367 Weight Estimate Date: 5/13/22 By: KVC

Spars and Rigging

Item	#	Area/ Length	Unit Weight	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
SPARS & BOOMS								
NAVIGATION MAST 4" SCH 80	1	13	15	0.087	41	3.57	-9.5	-0.83
NAVIGATION MAST 2" X 3/8" F.B.	1	20	2.55	0.023	39	0.89	-8.5	-0.19
NAVIGATION MAST 3/4" SCH 40	1	6	1.131	0.003	48	0.15	-9.5	-0.03
NAVIGATION MAST 3/4" ROUND BAR	11	1.67	1.50	0.012	41	0.51	-9.5	-0.12

Item	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
TOTAL RIGGING	**0.1**	**40.8**	**5.1**	**-9.3**	**-1.2**

D-367 Weight Estimate Date: 5/13/22 By: KVC

Furniture

Item	#	Unit Weight	Weight (lbs)	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
PILOT HOUSE								
CHART TABLE	1	175	175	0.078	29	2.27	-8.62	-0.67
PH CONSOLE	1	500	500	0.223	29	6.47	-16.34	-3.65
SETTEE	1	150	150	0.067	30	2.01	-8	-0.54
CAPTAIN'S CHAIR	1	50	50	0.022	29	0.65	-12.33	-0.28
01 DECK								
PASSENGER SEATS	26	25	650	0.290	20.5	5.95	5	1.45
MAIN DECK								
PASSENGER SEATS PORT SIDE	12	25	300	0.134	13	1.74	-4	-0.54
PASSENGER SEATS STBD SIDE	19	25	475	0.212	13	2.76	15.25	3.23
MAIN DECK PLUMBING FIXTURES								
TOILET, SINK, TP, MIRROR, DRYER PORT	1	163	163	0.073	13	0.95	2.65	0.19
TOILET, SINK, TP, MIRROR, DRYER STBD	1	163	163	0.073	13	0.95	-18.25	-1.33
GRAB BARS	1	25	25	0.011	14	0.16	-18	-0.20
ENGINE ROOM								
WORKBENCH	1	500	500	0.223	6	1.34	18.3	4.08

Item	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
TOTAL FURNITURE	**1.4**	**17.9**	**25.2**	**1.3**	**1.8**

D-367 Weight Estimate Date: 5/13/22 By: KVC

Main Machinery

Item	#	Unit Weight	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
MAIN ENGINE AND GEAR							
CAT C18	2	4300	3.84	5.50	21.12	10.82	41.54
Twin Disc MGX-516 GEAR	2	1587.33	1.42	4.50	6.38	12.00	17.01
Line Shaft - 5" Aqualoy 22	57	66.75	1.70	2.67	4.54	27.30	46.36
SHAFTING							
Thordon TG100 Seal #03	2	121	0.11	3.25	0.35	17.58	1.90
Duramax Marine Bearing #500	2	75	0.07	3.00	0.20	19.00	1.27
Kalenberg Muff Coupling	2	100	0.09	2.44	0.22	34.00	3.04
Strut Bearing - Duramax "Earth"	4	76	0.14	2.50	0.34	34	4.61
PROPELLER							
52" DIA. PROPELLER	2	550	0.49	2.15	1.06	40.5	19.89
PROPELLER NUTS	2	50	0.04	2.10	0.09	41.25	1.84

Item	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
TOTAL MAIN MACHINERY	**7.9**	**4.3**	**34.3**	**17.4**	**137.5**

D-367 Weight Estimate Date: 5/17/22 By: KVC

Auxiliary Machinery

Item	#	Unit Weight	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
STEERING GEAR & RUDDER BEARINGS							
Hydraulic Ram	2	30	0.03	9.40	0.25	43.5	1.17
Jockey Bar 4" SCH. 120 Pipe	8	19.00	0.07	9.40	0.64	42.2	2.87
Thordon SXL Bearing	2	30	0.03	5.61	0.15	43.7	1.17
Dodge Roller Bearing	2	100	0.09	8.50	0.76	43.7	3.90
Thorseal	2	100	0.09	7.55	0.67	43.7	3.90
Tiller	2	400	0.36	9.40	3.36	43.5	15.54
Steering HPUs	2	500	0.45	5.75	2.57	18.3	8.16
GENERATOR SETS							
CAT 4.4 SSDG	2	2800	2.50	6.00	15.00	8.44	21.10
BATTERIES							
MAIN BATTERIES 24V	2	80	0.07	4.50	0.32	2	0.14
MAIN BATTERY CHARGER 24V	2	150	0.13	5.00	0.67	2	0.27
B.T. BATTERIES 24V	2	80	0.07	6.00	0.43	-36.3	-2.60
B.T. BATTERY CHARGER 24V	1	150	0.07	6.00	0.40	-36.3	-2.43
SHIPS PUMPS BILGE, FIRE, ETC.							
BILGE PUMPS -	1	300	0.13	5.00	0.67	0.42	0.06
FIRE PUMPS -	1	300	0.13	5.00	0.67	0.42	0.06
AIR TANKS, COMPRESSORS & DRIVES							
AIR COMPRESSORS	2	525	0.47	7.00	3.28	17.56	8.23
AIR RECIEVERS	2	700	0.63	7.00	4.38	17.56	10.98
PW SYSTEM COMPONENTS							
POTABLE WATER SUPPLY PUMPS	2	23	0.02	5	0.10	1.68	0.03
HOT WATER CICULATION PUMP	2	20	0.02	5	0.09	2	0.04
POTABLE WATER PRESSURE TANK	2	123	0.11	7	0.77	1.75	0.19
INSTANT WATER HEATERS	2	40	0.04	14.25	0.51	21	-6.50
HEATING BOILER & EQUIPMENT							
MODINE HEATERS IN ER	4	45	0.08	10	0.80	10	0.80
MODINE HEATER IN STEERING	1	45	0.02	9.75	0.20	35	0.70
MODINE HEATER IN BOW THRUSTER COMP.	1	45	0.02	9.75	0.20	-35	-0.70

D-367 Weight Estimate Date: 5/17/22 By: KVC

Auxiliary Machinery

Item	#	Unit Weight	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
BOILER IN ER	1	1100	0.49	8	3.93	16.5	8.10
BOW THRUSTERS & DRIVES							
THRUSTER	1	800	0.36	3	1.07	-38.1	-13.61
PTO-HYDRAULIC W/ CLUTCH	2	100	0.09	3	0.27	12	1.07
HYDRAULIC RESEVOIR / HEATER	1	500	0.22	4.5	1.00	-37	-8.26
FUEL PUMPS							
FUEL OIL SEPARATOR	1	265	0.12	7	0.83	11.6	1.37
LUBE/DIRTY OIL PUMP	1	75	0.03	7	0.23	17.75	0.59
LUBE OIL DIAPRAGM PUMP	2	15	0.01	5	0.07	12	0.16
FLEX HOSE W/ REEL	1	70	0.03	7	0.22	17.75	0.55
ENGINE, GEN, E. GEN & BOW THRUSTER ROOM VENTILATION							
HARTZELL 52 AXIAL DUCT BLOWER	1	315	0.14	12.5	1.76	6.15	0.86
INTAKE LOUVER W/FIRE DAMPER	1	56	0.03	16	0.40	4	0.10
EXHAUST LOUVER W/FIRE DAMPER	1	105	0.05	25	1.17	5.2	0.24
VENTILATION FANS, LOUVERS, DAMPERS, A/C UNITS, HEATERS, HANGERS & DUCTS							
AIR SPLITTER - ER INTAKE	1	100	0.045	11.00	0.491	6.15	0.275
VALAD RSDM ELECTRIC HEATER - STEERING	2	50	0.045	29.00	1.295	-12.00	-0.536
VENTILATOR PILOTHOUSE	1	50	0.022	34.50	0.770	-8.00	-0.179
A/C UNIT PILOTHOUSE	2	60	0.054	35.60	1.907	-11.00	-0.589
VENTILATOR PORT	2	50	0.045	19.00	0.848	7.50	0.335
VENTILATOR STBD	2	50	0.045	19.00	0.848	4.50	0.201
HEAD FAN PORT	1	30	0.013	19.00	0.254	2.33	0.031
HEAD FAN STBD	1	30	0.013	19.00	0.254	-15.00	-0.201
HEATING CIRCULATION PUMP - FM24R	1	50	0.022	9.00	0.201	2.25	0.050
AIR HANDLING UNIT - PH	1	89	0.040	18.00	0.715	2.25	0.089
Item			Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
TOTAL AUXILIARY MACHINERY			**7.5**	**7.4**	**55.4**	**7.7**	**57.7**

D-367 Weight Estimate Date: 5/18/22 By: KVC

Machinery Outfit

Item	#	Unit Weight	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
TANK OUTFIT							
ENGINE RM BOILER EXPANSION TANK	1	125	0.06	10.00	0.6	16	0.9
SPARES							
SPARES - GENERAL	1	400	0.18	6.5	1.2	1.9	0.3
EXHAUST							
EXHAUST SYS. 8" SILENCER	1	222	0.10	17.4	1.7	11.9	1.2
EXHAUST SYS. 8" SILENCER	1	222	0.10	17.5	1.7	6.5	0.6
EXHAUST SYS. 8" EXPANSION	6	40	0.11	15	1.6	11	1.2
EXHAUST SYS. 8" SCH.40 PIPE	80	28.6	1.02	15	15.3	11	11.2
EXHAUST SYS. 4" SCH.40 PIPE	65	10.8	0.31	15	4.7	9	2.8
EXHAUST SYS. 4" SILENCER	2	70	0.06	9.7	0.6	11.9	0.7
EXHAUST SYS. 4" EXPANSION	6	20	0.05	15	0.8	8	0.4
EXHAUST SYS. FITTINGS & HANGERS	1	400	0.18	15	2.7	10	1.8
EXHAUST SYS. INSULATION BLANKET 8" DIAM.	30	9	0.12	15	1.8	11	1.3
EXHAUST SYS. INSULATION BLANKET 4" DIAM.	13	9	0.05	15	0.8	9	0.5
BOILER EXHAUST 8" SCH 40 PIPE	25	28.6	0.32	17	5.4	10	3.2
BOILER EXHAUST INSULATION BLANKET 8" DIA	9	9	0.04	17	0.6	10	0.4
FIRE SUPPRESSION							
Novec 1230 Fire Supression System	1	400	0.18	14	2.5	24.33	4.3
KEEL COOLERS							
KEEL COOLER GUARDS - 3/8" PLT	92	15.32	0.63	1.2	0.8	11.5	7.2
KEEL COOLER GUARDS - 3/4" SQ BAR	75	1.913	0.06	1.2	0.1	11.5	0.7
CN1263C-Z	2	125	0.11	1.2	0.1	15.53	1.7
D1075U-Z	2	151	0.13	1.2	0.2	8.35	1.1
BN1257B	2	91	0.08	1.2	0.1	9.73	0.8
BN1033B-Z	2	62	0.06	1.2	0.1	14.53	0.8
Item			Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
TOTAL MACHINERY OUTFIT			**4.0**	**11.0**	**43.3**	**11.0**	**43.4**

D-367 Weight Estimate Date: 5/17/22 By: KVC

Group XIII - Electrical

Item	#	Unit Weight	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
WIRE							
WIRE	1	4000	1.79	11.00	19.64	1	1.8
SWITCHBOARDS & TRANSFORMERS							
MAIN SWITCHBOARD - 240VAC 3PHASE 60Hz	1	700	0.31	6.00	1.88	0.83	0.3
120VAC SWITCHBOARD - 120VAC 3PHASE 60Hz	1	50	0.02	6.00	0.13	0.83	0.0
75 kVA TRANSFORMER	3	550	0.74	6.00	4.42	0.83	0.6
10 kVA TRANSFORMER	3	172	0.23	6.00	1.38	0.83	0.2
ENGINE ROOM PANEL	1	50	0.02	6.00	0.13	0.50	0.0
VENTILATION PANEL	1	50	0.02	6.00	0.13	0.50	0.0
LIGHTING PANEL 1	1	50	0.02	6.00	0.13	0.83	0.0
LIGHTING PANEL 2	1	50	0.02	6.00	0.13	0.83	0.0
ENGINE ROOM 24 VDC PANEL	1	50	0.02	6.00	0.13	0.83	0.0
PILOT HOUSE PANEL	1	50	0.02	6.00	0.13	-16.50	-0.4
PILOT HOUSE - NAVIGATION LIGHT PANEL	1	50	0.02	6.00	0.13	-16.50	-0.4
PILOT HOUSE 12 VDC PANEL	1	50	0.02	6.00	0.13	-16.50	-0.4
PILOT HOUSE 24 VDC PANEL	1	50	0.02	6.00	0.13	-16.50	-0.4
MOTOR STARTERS	1	300	0.13	5.00	0.67	0.83	0.1
FIXTURES							
BOW THRUSTR COMP - LINEAR LED	3	17.00	0.02	11.50	0.26	-36.00	-0.8
BOW THRUSTR COMP - OUTLET WT	1	3	0.00	8.00	0.01	-31.00	0.0
FOREPEAK VOID - LINEAR LED	2	17.00	0.02	11.50	0.17	-45.00	-0.7
VOID FR 8-14 - LINEAR LED	3	17.00	0.02	11.50	0.26	-22.65	-0.5
VOID FR 14-20 - LINEAR LED	6	17.00	0.05	11.50	0.52	-7.00	-0.3
VOID FR 14-20 - OUTLET WT	1	3.00	0.00	5.00	0.01	-6.00	0.0
ENGINE ROOM - LINEAR LED	13	17.00	0.10	10.75	1.06	9.40	0.9
ENGINE ROOM - OUTLET WT	4	3	0.01	5.50	0.03	9.40	0.1
VOID FR 28-34 - LINEAR LED	4	17.00	0.03	10.75	0.33	24.40	0.7
STEERING GEAR COMP - LINEAR LED	3	17	0.02	10.75	0.24	39.06	0.9
STEERING GEAR COMP - OUTLET WT	1	3	0.00	5.50	0.01	36.00	0.0
MN DK FORW RAIL MOUNTED LIGHTS	7	12.00	0.04	15.50	0.58	-30.76	-1.2

D-367 Weight Estimate Date: 5/17/22 By: KVC

Group XIII - Electrical

Item	#	Unit Weight	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
MN DK FORW OUTLET WT	2	3.0	0.00	14.50	0.04	-19.50	-0.1
MN DK MID RAIL MOUNTED LIGHTS	6	12.00	0.03	18.00	0.58	5.50	0.2
MN DK AFT RAIL MOUNTED LIGHTS	7	12.00	0.04	13.50	0.51	43.80	1.6
MN DK AFT OUTLET WT	2	3	0.00	13.00	0.03	34.40	0.1
MAIN DECK CABIN EXITS	4	15	0.03	18.00	0.48	11.00	0.3
MAIN DECK CABIN - LED PANEL	36	20	0.32	18.00	5.79	11.00	3.5
MAIN DECK CABIN OUTLETS	15	3	0.02	12.00	0.24	11.00	0.2
01 DECK RAIL MOUNTED LIGHTS	17	12	0.09	21.33	1.94	-1.00	-0.1
01 DECK DOWN LIGHTS	5	10	0.02	26.00	0.58	-11.00	-0.2
01 DECK OUTLET WT	3	3	0.00	20.50	0.08	-4.00	0.0
FLOOD LIGHTS 01 DECK	3	15	0.02	26.50	0.53	7.00	0.1
FLOOD LIGHTS PILOT HOUSE DECK	5	15	0.03	34.67	1.16	-16.00	-0.5
PILOTHOUSE DOWN LIGHT	9	10.0	0.04	34.25	1.38	-12.40	-0.5
PH DECK RAIL MOUNTED LIGHTS	3	12.0	0.02	29.25	0.47	-7.00	-0.1
PH DECK OUTLETS	5	3	0.01	28.50	0.19	-9.00	-0.1
CHART LIGHT	1	15	0.01	31.25	0.21	-8.18	-0.1
STBD/PORT SIDE NAV LIGHTS	2	32	0.03	27.80	0.79	-13.50	-0.4
FWD MASTHEAD NAV LIGHT	1	32	0.01	36.50	0.52	-19.21	-0.3
SEARCH LIGHT	1	20	0.01	36.50	0.33	-17.68	-0.2
FUELING RED LIGHT	1	15.5	0.01	47.67	0.33	-10.75	-0.1
ALL AROUND ANCHOR NAV LIGHT	6	15.5	0.04	19.50	0.81	12.00	0.5
SHORE POWER CONNECTION BOX/CABLE	1	40.0	0.02	14.00	0.25	34.00	0.6
ELECTRONICS							
FURUNO FR-8125 RADAR	1	150	0.07	38.17	2.56	-6.5	-0.4
FURUNO FR-8125 RADAR	1	150	0.07	38.17	2.56	-6.5	-0.4
ICOM IC-M510 VHF RADIO	2	5.5	0.00	38.17	0.19	-6.5	0.0
AIS FURUNO FA170	1	10.0	0.00	34.00	0.15	-6.5	0.0
NAV COMPUTER / MONITOR	1	20.0	0.01	34.00	0.30	-6.5	-0.1
SAT COMPASS FURUNO SC70	1	10.0	0.00	34.00	0.15	-6.5	0.0
AUTOPILOT SIMRAD AP70 MK2	1	15.0	0.01	34.00	0.23	-6.5	0.0

D-367 Weight Estimate Date: 5/17/22 By: KVC

Group XIII - Electrical

Item	#	Unit Weight	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
30W AMPLIFIER	2	5	0.00	38.17	0.17	-6.5	0.0
STAINLESS STEEL RATCHET MOUNT	2	2	0.00	38.17	0.07	-6.5	0.0
HAILER HORN	2	5	0.00	36.50	0.16	-6.5	0.0
DIGITAL 8' ANTENNA	2	3	0.00	38.17	0.10	-6.5	0.0
FURUNO GP170D GPS	1	13	0.01	38.17	0.22	-6.5	0.0
STAINLESS STEEL RATCHET MOUNT	1	2	0.00	38.17	0.03	-6.5	0.0
FURUNO FCV588 DEPTH SOUNDER/XDUCER	1	4.0	0.00	38.17	0.07	-6.5	0.0
STANDARD WIND SPEED W/100'CABLE	1	2	0.00	38.17	0.03	-6.5	0.0
ID SYSTEM	1	100	0.04	29.00	1.29	-6.5	-0.3
PA SYSTEM MICROPHONE	1	100	0.04	29.00	1.29	-11.0	-0.5
PA SPEAKERS IN PASSENGER CABIN	1	100	0.04	18.00	0.80	6.0	0.3
CCTV SECURITY CAMERA SYSTEM	15	5	0.03	19.50	0.65	0.0	0.0

Item	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
TOTAL ELECTRICAL	**4.8**	**12.5**	**60.4**	**0.7**	**3.6**

D-367 Weight Estimate Date: 5/20/22 By: KVC

Group XIV - Other

Item	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
Weld - 3% Steel	3.8	6.90	26.2	1.00	3.8
Paint - 1% Steel	1.3	6.90	8.7	1.00	1.3
Total	**5.1**	**6.9**	**34.9**	**1.0**	**5.1**

D-367 Weight Estimate Date: 5/19/22 By: KVC

Piping

Item	#	Unit Weight	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
DECK DRAINS							
1-1/2" HAYWARD DECK DRAIN	27	4.0	0.05	22.75	1.10	0.0	0.00
1-1/2" 316L SS SCH 40 PIPE	155	2.1	0.15	19.50	2.83	0.0	0.00
2" 316L SS SCH 40 PIPE	41	2.66	0.05	11.25	0.55	15.5	0.75
2-1/2" 316L SS SCH 40 PIPE	23	3.56	0.04	11.20	0.41	15.5	0.57
FUEL							
HLD F.O. PIPING 1 INCH PIPE	38.68	1.68	0.03	3.50	0.10	4.0	0.12
HLD F.O. PIPING 1-1/2 INCH PIPE	66	2.72	0.08	3.50	0.28	4	0.32
HLD F.O. PIPING 3/4 INCH PIPE	72	1.13	0.04	3.50	0.13	8	0.29
HLD F.O. PIPING 2 INCH PIPE	35	3.65	0.06	3.50	0.20	-5	-0.29
HLD F.O. PIPING 3/4 INCH REDUCER	6	0.44	0.00	3.50	0.00	8	0.01
HLD F.O. PIPING 3/4 INCH CHECK	4	3.25	0.01	3.50	0.02	8	0.05
HLD F.O. PIPING 1 INCH CHECK	2	3.75	0.00	3.50	0.01	4	0.01
HLD F.O. PIPING 2 INCH CHECK	1	5	0.00	3.50	0.01	-5	-0.01
HLD F.O. PIPING 1 INCH GATE	2	12	0.01	3.50	0.04	4	0.04
HLD F.O. PIPING 3/4 INCH GATE	4	8	0.01	3.50	0.05	8	0.11
HLD F.O. PIPING 2 INCH GATE	2	40	0.04	3.50	0.13	0	0.00
HLD F.O. PIPING REACH ROD	1	20	0.01	8.00	0.07	12	0.11
HLD F.O. PIPING 3/4 INCH DUPLEX STNR.	3	40	0.05	4.00	0.21	8	0.43
HLD F.O. PIPING 1 INCH DUPLEX STRAINER	2	47	0.04	4.00	0.17	4	0.17
HLD F.O. PIPING 2 INCH DUPLEX STRAINER	1	122	0.05	4.00	0.22	0	0.00
HLD F.O. PIPING FLEX HOSE	24	0.5	0.01	3.50	0.02	-6	-0.03
HLD F.O. PIPING SITE GUAGE	1	25	0.01	7.00	0.08	-11.5	-0.13
MN DK F.O. PIPING VENT	1	23	0.01	14.25	0.15	10	0.10
FITTINGS	1	125	0.06	3.50	0.20	3.00	0.17
FRESH WATER							0.00
3/4" HOSE BIB	2	3	0.00	4.25	0.01	4.0	0.01
FRESH WATER FILTER	2	30	0.03	4.25	0.11	2.0	0.05
1/2" GATE VALVE BRONZE	4	0.80	0.00	4.25	0.01	9.0	0.01
3/4" CHECK VALVE BRONZE	1	1.00	0.00	4.25	0.00	2.0	0.00

D-367 Weight Estimate Date: 5/19/22 By: KVC

Piping

Item	#	Unit Weight	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
3/4" RELIEF VALVE BRONZE	1	4.00	0.00	4.25	0.01	2.0	0.00
PRESSURE GAUGE	1	5.00	0.00	4.25	0.01	2.0	0.00
3/4" GATE VALVE BRONZE	3	1.10	0.00	4.25	0.01	2.0	0.00
1/2" PIPE COPPER TYP L	10	0.29	0.00	4.25	0.01	-9.0	-0.01
1 1/2" PIPE COPPER TYP L	30.0	1.14	0.02	4.25	0.06	-3.0	-0.05
2" PIPE COPPER TYP L	20.0	1.75	0.02	4.25	0.07	-5.0	-0.08
1" GATE VALVE BRONZE	3	1.80	0.00	4.25	0.01	10.0	0.02
1" PIPE COPPER TYP L	25.0	0.66	0.01	4.25	0.03	10.0	0.07
3/4" PIPE COPPER TYP L	110.0	0.46	0.02	10.00	0.22	-5.0	-0.11
2" VENT	23.0	3.66	0.04	15.00	0.56	-6.3	-0.23
MIXING VALVE BRONZE	2.0	2.00	0.00	14.00	0.03	-9.0	-0.02
FITTINGS COPPER TYP L #300	1	100.0	0.04	4.25	0.19	0.0	0.00
PIPIE INSULATION	1	50.0	0.02	13.00	0.29	2.0	0.04
SANITARY							
3" GATE VALVE	3	75	0.10	4.00	0.40	-7.6	-0.76
3/4" PIPE COPPER TYP K	1	70	0.03	10.00	0.31	7.0	0.22
3/4" HOSE BIB	2	5	0.00	13.83	0.06	34.4	0.15
1" GATE VALVE	4	12	0.02	2.50	0.05	3.0	0.06
1" CHECK VALVE	1	25	0.01	2.50	0.03	3.0	0.03
1" PIPE COPPER TYP K	60	0.839	0.02	2.50	0.06	3.0	0.07
1-1/2" PIPE CU-NI	10	4.048	0.02	2.50	0.05	3.0	0.05
4" CLEAN OUT	1	2.55	0.00	10.00	0.01	-3.0	0.00
4" PIPE	20	10.79	0.10	11.00	1.06	0.0	0.00
4" VERTICAL PIPE	20	10.79	0.10	10.00	0.96	6.0	0.58
2" PIPE	30	3.65	0.05	7.00	0.34	-7.0	-0.34
3" PIPE	80	7.58	0.27	11.00	2.98	-10.0	-2.71
3" CLEAN OUT	2	2	0.00	10.00	0.02	-8.0	-0.01
3" VERTICAL PIPE	50	7.58	0.17	12.00	2.03	-10.0	-1.69
SLOAN FLUSH VALVE	2	12	0.01	12.25	0.13	-8.0	-0.09
AIR ADMITTANCE VALVE	2	5	0.00	13.00	0.06	-10.0	-0.04

D-367 Weight Estimate Date: 5/19/22 By: KVC

Piping

Item	#	Unit Weight	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
FITTINGS	1	150	0.07	11.00	0.74	0.0	0.00
BILGE, FIRE, ETC.							
SEA WATER PRESSURE SET	1	123	0.05	7	0.38	5.5	0.30
SEA CHEST 14" X-S PIPE	2	107	0.10	2.5	0.24	2	0.19
SEA CHEST VENT 1-1/2" PIPE	66	2.72	0.08	12	0.96	4	0.32
BILGE 4" SCH 80 PIPE	20	14.9	0.13	2.5	0.33	1	0.13
BILGE 4" S.S. PIPE	6	10.794	0.03	2.5	0.07	1	0.03
BILGE 4" GATE VALVE BRONZE 150#	4	18	0.03	2.5	0.08	1	0.03
BILGE 4" CHECK VALVE BRONZE 300#	2	20	0.02	2.5	0.04	1	0.02
BILGE 4" DUPLEX STRAINER	2	500	0.45	3	1.34	1	0.45
BILGE 3" SCH 80 PIPE	20	10.3	0.09	2.5	0.23	1	0.09
BILGE 2-1/2" SCH 80 PIPE	20	7.67	0.07	2.5	0.17	0	0.00
BILGE 2 1/2" GATE VALVE BRONZE 150#	9	14	0.06	4.25	0.24	0	0.00
BILGE 2 1/2" CHECK VALVE BRONZE 300#	4	11	0.02	4.25	0.08	0	0.00
BILGE MANIFOLD 6"x6"x1/2" SQ TUBE	10	35.24	0.16	4.25	0.67	3	0.47
BILGE 2" SCH 80 PIPE	6	5.03	0.01	2.5	0.03	10	0.13
BILGE 2" GATE VALVE BRONZE 150#	1	11	0.00	4.25	0.02	10	0.05
BILGE 2" CHECK VALVE BRONZE 300#	1	9	0.00	4.25	0.02	10	0.04
BILGE 1-1/2" SCH 80 PIPE	225	3.63	0.36	2.5	0.91	-20	-7.29
BILGE 1 1/2" GATE VALVE BRONZE 150#	13	6	0.03	4.25	0.15	3.00	0.10
BILGE 1 1/2" CHECK VALVE BRONZE 150#	12	4	0.02	4.25	0.09	3.00	0.06
BILGE 2 1/2" SIMPLEX STRAINER	2	50	0.04	4.50	0.20	2.00	0.09
BILGE PRESSURE GAUGE	4	5	0.01	5.00	0.04	1.00	0.01
BILGE FOOT VALVE w/STRAINER	8	20	0.07	1.00	0.07	-20.00	-1.43
BILGE BELLMOUTH	8	20	0.07	1.00	0.07	-20.00	-1.43
BILGE FITTINGS	1	300	0.13	3.50	0.47	0.00	0.00
FIRE 2" PIPE	60	3.65	0.10	11.00	1.08	0	0.00
FIRE 1 1/2" PIPE	50	2.72	0.06	11.00	0.67	0	0.00
FIRE 2" GATE VALVE BRONZE 150#	1	9	0.00	4.25	0.02	0	0.00
FIRE 2 1/2" SHORE CONNECTION	1	20	0.01	4.25	0.04	0	0.00

D-367 Weight Estimate Date: 5/19/22 By: KVC

Piping

Item	#	Unit Weight	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
FIRE FITTINGS	1	100	0.04	4.25	0.19	0	0.00
AIR							
COMPRESSED AIR PIPING 1-1/2 INCH SCH 80	75	3.63	0.12	6.00	0.73	10	1.22
COMPRESSED AIR PIPING 1 INCH SCH 80	90	2.17	0.09	6.00	0.52	10	0.87
COMPRESSED AIR PIPING 3/4 INCH SCH 80	60	1.48	0.04	6.00	0.24	10	0.40
COMPRESSED AIR PIPING 1/2 INCH SCH 80	10	1.09	0.00	6.00	0.03	10	0.05
COMPRESSED AIR GATE 1-1/2 INCH	9	40	0.16	6.00	0.96	17.5	2.81
COMPRESSED AIR GATE 1 INCH	1	16	0.01	6.00	0.04	15	0.11
COMPRESSED AIR GATE 1/2 INCH	1	8	0.00	6.00	0.02	15	0.05
COMPRESSED AIR CHECK 1-1/2 INCH	2	28	0.03	6.00	0.15	15	0.38
COMPRESSED AIR CHECK 1 INCH	5	14	0.03	6.00	0.19	15	0.47
COMPRESSED AIR BALL 1-1/2 INCH	5	16	0.04	6.00	0.21	15	0.54
COMPRESSED AIR BALL 1 INCH	7	9	0.03	6.00	0.17	15	0.42
COMPRESSED AIR BALL 3/4 INCH	2	5	0.00	6.00	0.03	15	0.07
COMPRESSED AIR BALL 1/2 INCH	1	4	0.00	6.00	0.01	15	0.03
COMPRESSED AIR SOLENOID VALVE 1-1/2"	2	10	0.01	6.00	0.05	17.5	0.16
COMPRESSED AIR SOLENOID VALVE 1/2"	1	5	0.00	6.00	0.01	17.5	0.04
COMPRESSED AIR FLEX CONNECTION 1-1/2"	2	5	0.00	6.00	0.03	10	0.04
COMPRESSED AIR FLEX CONNECTION 1"	3	5	0.01	6.00	0.04	10	0.07
COMPRESSED AIR FLEX CONNECTION 1/2"	1	5	0.00	6.00	0.01	10	0.02
COMPRESSED AIR PRESSURE GUAGE	10	5	0.02	6.00	0.13	17.5	0.39
COMPRESSED AIR Y STRAINER	2	10	0.01	6.00	0.05	17	0.15
COMPRESSED AIR LUBRICATORS	2	15	0.01	6.00	0.08	17.5	0.23
COMPRESSED AIR DRYER	2	57	0.05	6.00	0.31	17.5	0.89
COMPRESSED AIR FILTER	2	1.3	0.00	6.00	0.01	17.5	0.02
COMPRESSED AIR PRESSURE RELIEF VALVES	2	10	0.01	6.00	0.05	17.5	0.16
FITTINGS	1	150	0.07	6.00	0.40	15	1.00
LUBE							
LUBE OIL PIPING 1-1/2 INCH	30	2.72	0.04	4.25	0.15	12	0.44
LUBE OIL PIPING 1 INCH	30	1.68	0.02	4.25	0.10	12	0.27

D-367 Weight Estimate Date: 5/19/22 By: KVC

Piping

Item	#	Unit Weight	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
LUBE OIL BALL VALVE 1-1/2 INCH	3	12	0.02	4.25	0.07	12	0.19
LUBE OIL BALL VALVE 1 INCH	4	6	0.01	4.25	0.05	12	0.13
LUBE OIL CHECK VALVE 1-1/2 INCH	4	21	0.04	4.25	0.16	12	0.45
LUBE OIL CHECK VALVE 1 INCH	1	10	0.00	4.25	0.02	12	0.05
LUBE OIL BALL VALVE 1/2 INCH	2	4	0.00	4.25	0.02	12	0.04
LUBE OIL FLEXIBLE CONNECTION 1 INCH	4	5	0.01	6.00	0.05	12	0.11
LUBE OIL FILL 1-1/2" SCH 40	20	2.72	0.02	11.00	0.27	19	0.46
LUBE OIL VENT 2" SCH 40	20	3.66	0.03	11.00	0.36	19	0.62
LUBE OIL DUPLEX STRAINER 1-1/2"	1	100	0.04	4.50	0.20	19	0.85
LUBE OIL HOSE CONNECTION	1	20	0.01	6.00	0.05	19	0.17
DIRTY OIL HAND PUMP	1	30	0.01	4.00	0.05	19	0.25
BILGE SLOPS PUMP OUT 1-1/2" SCH 40	20	2.72	0.02	11.00	0.27	19	0.46
BILGE SLOPS VENT 2" SCH 40	20	3.66	0.03	11.00	0.36	19	0.62
DIRTY OIL PUMP OUT 1-1/2" SCH 40	20	2.72	0.02	11.00	0.27	19	0.46
DIRTY OIL VENT 2" SCH 40	20	3.66	0.03	11.00	0.36	19	0.62
GAUGES	4	5	0.01	4.50	0.04	19	0.17
FITTINGS	1	200	0.09	4.25	0.38	15.0	1.34
KEEL COOLING							
3 INCH SCH 80	20	10.26	0.09	1.50	0.14	11.5	1.05
2-1/2 INCH SCH 80	40	7.67	0.14	1.50	0.21	11.5	1.58
1-1/2 INCH SCH 80	40	3.63	0.06	1.50	0.10	11.5	0.75
1 INCH SCH 80	20	2.17	0.02	1.50	0.03	11.5	0.22
3/4 INCH SCH 80	30	1.48	0.02	1.50	0.03	11.5	0.23
1/2 INCH SCH 80	40	1.09	0.02	1.50	0.03	11.5	0.22
GATE 2-1/2 INCH	14	40	0.25	2.00	0.50	11.5	2.88
GATE 3 INCH	6	16	0.04	2.00	0.09	11.5	0.49
GATE 2 INCH	6	8	0.02	2.00	0.04	11.5	0.25
BALL 3 INCH	2	16	0.01	2.00	0.03	11.5	0.16
BALL 3/4 INCH	4	5	0.01	2.00	0.02	11.5	0.10
FLEX CONNECTION	12	5	0.03	5.00	0.13	11.5	0.31

D-367 Weight Estimate Date: 5/19/22 By: KVC

Piping

Item	#	Unit Weight	Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
EXPANSION TANK	4	25	0.04	6.00	0.27	11.5	0.51
PRESSURE/TEMPERATURE GAUGE	30	5	0.07	5.00	0.33	11.5	0.77
HEATING							
W-M Baseboard Heater	41	2.5	0.05	11.67	0.53	11.0	0.50
ECO Panel	5	75	0.17	14.17	2.37	11	1.84
Hydraulic Oil Heater	1	40	0.02	4.00	0.07	11	0.20
Supply Manifold	5	21.6	0.05	5.83	0.28	11	0.53
Return Manifold	5	21.63	0.05	5.83	0.28	11	0.53
HW Piping 1 1/4 INCH COPPER TYP K	210	1.04	0.10	11	1.07	11	1.07
HW Piping 3/4 INCH COPPER TYP K	150	0.641	0.04	11	0.47	11	0.47
HW Piping 1/2 INCH COPPER TYP K	80	0.344	0.01	11	0.14	11	0.14
HW Fittings and Valves	1	200	0.09	11	0.98	11	0.98
HYDRAULIC							
H.O. PIPING	1	200	0.09	6.75	0.60	25	2.23
FITTINGS	1	100.0	0.04	6.75	0.30	25.0	1.12
Item			Weight (LT)	VCG (ft)	V-Mom (LT*ft)	LCG (ft)	L-Mom (LT*ft)
TOTAL PIPING			**7.0**	**6.2**	**43.5**	**4.0**	**27.84**

FERNSTRUM®

RECOMMENDATION

R.W. Fernstrum & Company
1716 11th Avenue
Menominee MI 49858
Phone: 906-863-5553
FAX: 906-863-5203
E-mail: sales@fernstrum.com
TIN: 38-1375152
DUNS: 017237827
CAGE: 98396

QUOTE: 17955 LINE #1

GILBERT ASSOCIATES INC
ATTN: KARYN COX

Date: 8/3/2021
Salesperson: BRUCE NEECE

SYSTEM OPERATING CONDITIONS

HULL / PROJECT / JOB	VESSEL TYPE
MATINICUS ISLAND FERRY	FERRY
APPLICATION	**MINIMUM HULL SPEED**
PROPULSION	3 KNOTS
HULL MATERIAL	**MAXIMUM SEA TEMP**
STEEL	75.0 F

ENGINE INFORMATION

ENGINE MAKE	ENGINE MODEL	OUTPUT RATING
CATERPILLAR	C18	600 HP AT 1,800 RPM
EMISSIONS RATING	**GEAR MAKE & MODEL**	**ENGINE AGE**
EPA TIER 3	N/A	NEW

JACKETWATER CIRCUIT

HEAT REJECTION
14,680.0 BTU/MIN

COOLANT TEMPERATURE
INTO COOLER: 185.0º F

COOLANT FLOW RATE	COOLANT TYPE
78.00 GPM	50% WATER/GLYCOL

WE RECOMMEND THE FOLLOWING FOR THIS CIRCUIT:

QUANTITY	MODEL NUMBER	DESCRIPTION
1	D1075U-Z	COPPER NICKEL GRIDCOOLER® KEEL COOLER

NET WEIGHT EACH	FLUID CAPACITY EACH
151.0 LBS	3.97 GALLONS

COMMENTS

If the above recommendation is based on full rated power in still water (0 knot hull speed) or on generator set engines, the cooling system relies on thermal or convection current flow past the cooler tubes of 1/2 mile per hour. The keel cooler should be installed so as to permit free circulation of water past the cooler tubes. We do not recommend recessing units on the bottom of a flat bottom boat unless that section of the hull where the keel cooler is to be mounted is at a minimum of 20 degrees (from forward to aft).

For more information on the **GRIDCOOLER®** Keel Cooler, visit our website at **www.fernstrum.com**.

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FERNSTRUM®

RECOMMENDATION

R.W. Fernstrum & Company
1716 11th Avenue
Menominee MI 49858
Phone: 906-863-5553
FAX: 906-863-5203
E-mail: sales@fernstrum.com
TIN: 38-1375152
DUNS: 017237827
CAGE: 98396

QUOTE: 17955 LINE #2

GILBERT ASSOCIATES INC
ATTN: KARYN COX

Date: 8/3/2021
Salesperson: BRUCE NEECE

SYSTEM OPERATING CONDITIONS

HULL / PROJECT / JOB	VESSEL TYPE
MATINICUS ISLAND FERRY	FERRY
APPLICATION	**MINIMUM HULL SPEED**
PROPULSION	3 KNOTS
HULL MATERIAL	**MAXIMUM SEA TEMP**
STEEL	75.0 F

ENGINE INFORMATION

ENGINE MAKE	ENGINE MODEL	OUTPUT RATING
CATERPILLAR	C18	600 HP AT 1,800 RPM
EMISSIONS RATING	**GEAR MAKE & MODEL**	**ENGINE AGE**
EPA TIER 3	TWIN DISC	NEW

AFTERCOOLER AND GEAR CIRCUIT

HEAT REJECTION

6,191.0 BTU/MIN AC
890.0 BTU/MIN GEAR

7,081.0 BTU/MIN TOTAL

COOLANT TEMPERATURE

OUT OF COOLER: 126.0° F

COOLANT FLOW RATE	COOLANT TYPE
95.40 GPM	50% WATER/GLYCOL

WE RECOMMEND THE FOLLOWING FOR THIS CIRCUIT:

QUANTITY	MODEL NUMBER	DESCRIPTION
1	CN1263C-Z	COPPER NICKEL GRIDCOOLER® KEEL COOLER

NET WEIGHT EACH	FLUID CAPACITY EACH
125.0 LBS	2.40 GALLONS

COMMENTS

If the above recommendation is based on full rated power in still water (0 knot hull speed) or on generator set engines, the cooling system relies on thermal or convection current flow past the cooler tubes of 1/2 mile per hour. The keel cooler should be installed so as to permit free circulation of water past the cooler tubes. We do not recommend recessing units on the bottom of a flat bottom boat unless that section of the hull where the keel cooler is to be mounted is at a minimum of 20 degrees (from forward to aft).

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FERNSTRUM®

RECOMMENDATION

R.W. Fernstrum & Company
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TIN: 38-1375152
DUNS: 017237827
CAGE: 98396

QUOTE: 17955 LINE #3

GILBERT ASSOCIATES INC
ATTN: KARYN COX

Date: 8/3/2021
Salesperson: BRUCE NEECE

SYSTEM OPERATING CONDITIONS

HULL / PROJECT / JOB	VESSEL TYPE
MATINICUS ISLAND FERRY	FERRY
APPLICATION	**MINIMUM HULL SPEED**
GENERATOR	0 KNOTS
HULL MATERIAL	**MAXIMUM SEA TEMP**
STEEL	75.0 F

ENGINE INFORMATION

ENGINE MAKE	ENGINE MODEL	OUTPUT RATING
CATERPILLAR	C4.4	99 EKW AT 1,800 RPM
EMISSIONS RATING	**GEAR MAKE & MODEL**	**ENGINE AGE**
EPA TIER 3	N/A	NEW

JACKETWATER CIRCUIT

HEAT REJECTION
4,631.0 BTU/MIN

COOLANT TEMPERATURE
INTO COOLER: 185.0º F

COOLANT FLOW RATE	COOLANT TYPE
50.00 GPM	50% WATER/GLYCOL

WE RECOMMEND THE FOLLOWING FOR THIS CIRCUIT:

QUANTITY	MODEL NUMBER	DESCRIPTION
1	BN1257B-Z	COPPER NICKEL GRIDCOOLER® KEEL COOLER

NET WEIGHT EACH	FLUID CAPACITY EACH
91.0 LBS	1.21 GALLONS

COMMENTS

If the above recommendation is based on full rated power in still water (0 knot hull speed) or on generator set engines, the cooling system relies on thermal or convection current flow past the cooler tubes of 1/2 mile per hour. The keel cooler should be installed so as to permit free circulation of water past the cooler tubes. We do not recommend recessing units on the bottom of a flat bottom boat unless that section of the hull where the keel cooler is to be mounted is at a minimum of 20 degrees (from forward to aft).

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RECOMMENDATION

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E-mail: sales@fernstrum.com
TIN: 38-1375152
DUNS: 017237827
CAGE: 98396

QUOTE: 17955 LINE #4

GILBERT ASSOCIATES INC
ATTN: KARYN COX

Date: 8/3/2021
Salesperson: BRUCE NEECE

SYSTEM OPERATING CONDITIONS

HULL / PROJECT / JOB	VESSEL TYPE
MATINICUS ISLAND FERRY	FERRY
APPLICATION	**MINIMUM HULL SPEED**
GENERATOR	0 KNOTS
HULL MATERIAL	**MAXIMUM SEA TEMP**
STEEL	75.0 F

ENGINE INFORMATION

ENGINE MAKE	ENGINE MODEL	OUTPUT RATING
CATERPILLAR	C4.4	99 EKW AT 1,800 RPM
EMISSIONS RATING	**GEAR MAKE & MODEL**	**ENGINE AGE**
EPA TIER 3	N/A	NEW

AFTERCOOLER CIRCUIT

HEAT REJECTION
717.0 BTU/MIN

COOLANT TEMPERATURE
OUT OF COOLER: 113.0° F

COOLANT FLOW RATE	COOLANT TYPE
39.00 GPM	50% WATER/GLYCOL

WE RECOMMEND THE FOLLOWING FOR THIS CIRCUIT:

QUANTITY	MODEL NUMBER	DESCRIPTION
1	BN1033B-Z	COPPER NICKEL GRIDCOOLER® KEEL COOLER

NET WEIGHT EACH	FLUID CAPACITY EACH
62.0 LBS	0.70 GALLONS

COMMENTS

If the above recommendation is based on full rated power in still water (0 knot hull speed) or on generator set engines, the cooling system relies on thermal or convection current flow past the cooler tubes of 1/2 mile per hour. The keel cooler should be installed so as to permit free circulation of water past the cooler tubes. We do not recommend recessing units on the bottom of a flat bottom boat unless that section of the hull where the keel cooler is to be mounted is at a minimum of 20 degrees (from forward to aft).

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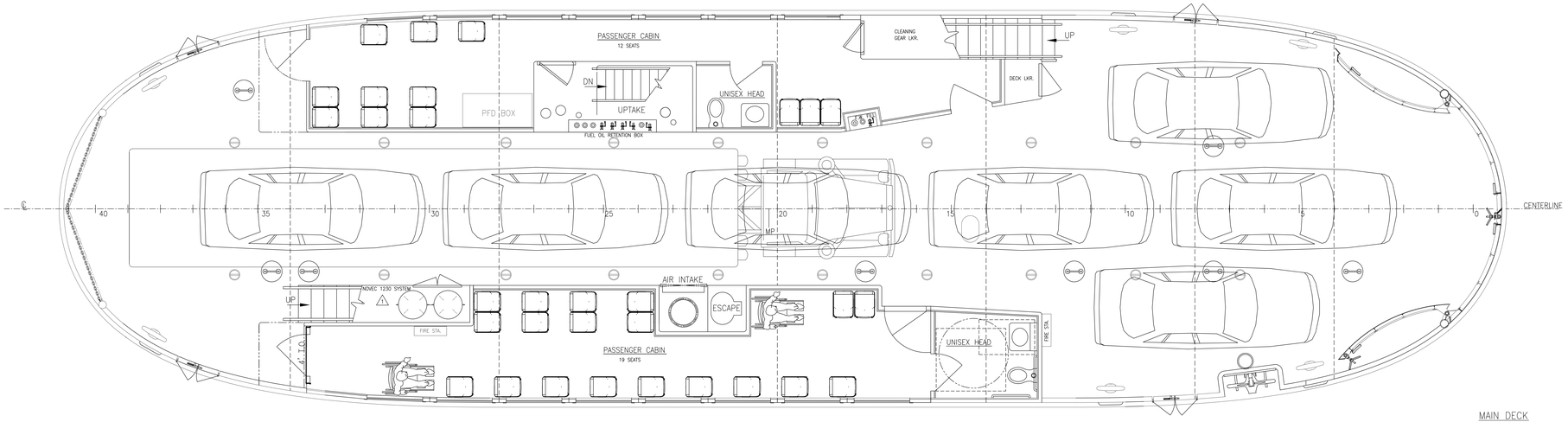
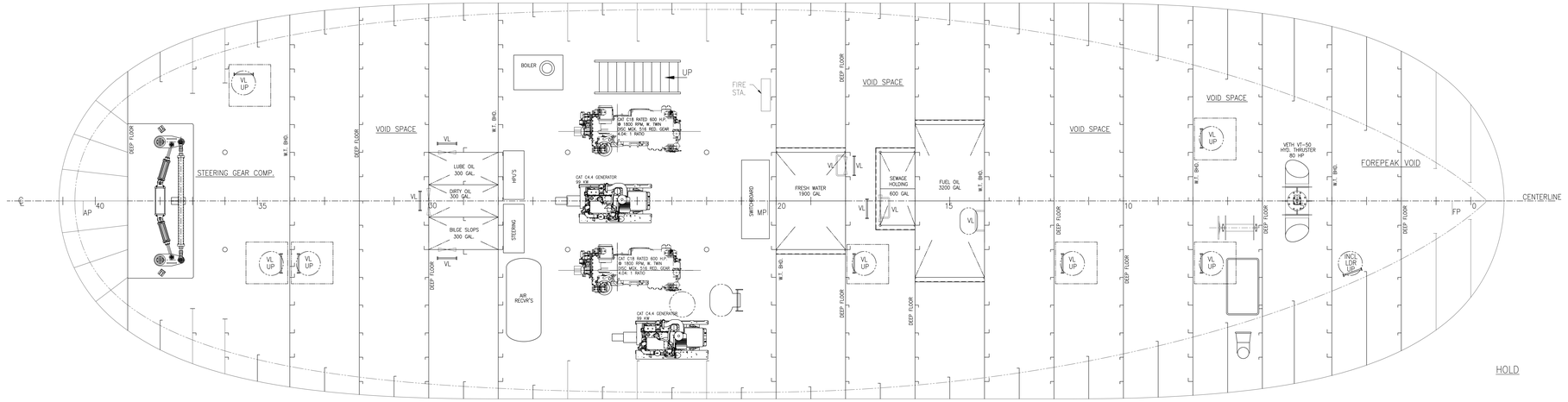




ALT	DESCRIPTION	DATE	NAME
1	FM 200 SYSTEM LOCKER RENAMES NOVEC 1230 SYSTEM LOCKER	5/24/22	JG

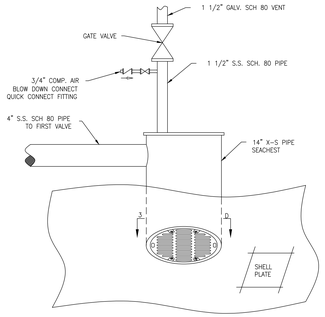
GILBERT ASSOCIATES, INC.
NAVAL ARCHITECTS
MARINE ENGINEERS
100 GROSSMAN DRIVE
BRAINTREE, MA 02184

104 FT LOA PASSENGER/VEHICLE FERRY

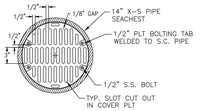
GENERAL ARRANGEMENT
HOLD & MAIN DECK

DRAWN BY JG/KC DATE 05/11/2021
CHECKED BY JG DATE
APPROVED BY DATE
SCALE 3/8" = 1'-0"
DWG. NO. D367-A1-1 ALT. 1

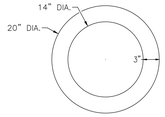
SHEET 1 OF 2



DETAIL 5-D
PROFILE VIEW OF SEA CHEST, LKG INBD
NOT TO SCALE



DETAIL 4-D
1/2" PLATE SEA CHEST STRAINER PLT.
SCALE: 1-1/2" = 1'-0"



DETAIL 3-D
5/8" INSERT PLATE
SCALE: 1-1/2" = 1'-0"

46 CFR 56.50-50(d) BILGE PIPING

LBP = 98.75 FT
B = 28.5 FT
D = 11.0 FT

(1) FOR SUCTIONS TO EACH MAIN BILGE PUMP:

$$d = 1 + \sqrt{\frac{L(B+D)}{2500}} = 2.25" - 2\ 1/2"\ \text{NOM SCH 80 PIPE}$$

(2) FOR BRANCH SUCTIONS:

$$d = 1 + \sqrt{\frac{c(B+D)}{1500}} =$$

COMPARTMENT	(c) LENGTH	(d) DIA REQ	NOMINAL PIPE
FOREPEAK	12.0	1.56	1 1/2"
THRUSTER VOID	10.0	1.51	1 1/2"
VOID 2	15.0	1.63	1 1/2"
VOID 3	15.0	1.63	1 1/2"
ENGINE ROOM	20.0	1.73	2"
VOID 4	15.0	1.63	1 1/2"
STRG GEAR COMP	17.0	1.67	1 1/2"

PER TABLE 182.520: 2 POWER BILGE PUMPS REQ'D

46 CFR 56.50-50 BILGE PUMPS

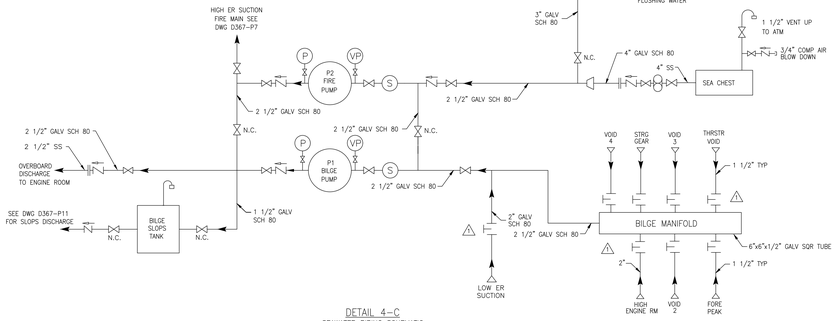
(c) BILGE PUMP CAPACITY
PUMP MUST DEVELOP NOT LESS THAN 400 FT/MIN VELOCITY IN THE BILGE MAIN
2 1/2" SCH 80 ID = 2.60"
Q = 110 GPM

MATERIAL LIST

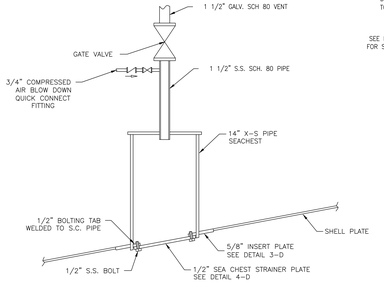
ITEM	QUANTITY	SPECIFICATION	MATERIAL
2 1/2", 2", 1 1/2" GALVANIZED STEEL PIPE	AS NEEDED	FURNACE BUTT-WELDED OR SEAMLESS STEEL, SCH. 80 GALVANIZED W/ THREADED JOINTS	ASTM A53
6" x 6" x 1/2" BOX TUBE	AS NEEDED	CARBON STEEL, GALVANIZED	ASTM A500
VALVES BRONZE GATE VALVES 150# CHECK VLVS BRONZE THRD 300#	AS NEEDED	BRONZE SCREWED OR FLANGED, W/ BRONZE MOUNTINGS	ASME SB62 ANSI B16.24 MSS SP-6,9,25,80
STEEL FITTINGS, TEES, AND ELBOWS IN BILGE SYSTEM	AS NEEDED	CARBON STEEL SCREWED ENDS, GALV. SCH 80	ASTM A234, A105 ASME B16.1 THRU ASME B16.11
OVERBOARD DISCHARGE AND SEACHESTS TO 1ST VALVES PIPING	AS NEEDED	STAINLESS STEEL GRADE 316 SCH. 80 WELDED	ASTM A312 ASME B31.1 ASME B36.19
FITTINGS WITHIN STAINLESS STEEL PIPING SECTIONS	AS NEEDED	316 STAINLESS STEEL SOCKET WELD SCH. 80	ASTM A403 ANSI B16.3
OVERBOARD DISCHARGE - VALVES	AS NEEDED	CAST IRON, OR DUCTILE OR NODULAR CAST IRON OR CAST STEEL FLANGED, GALV., W/ BRONZE MOUNTINGS	ASTM A395 ASME B16.34
FOOT VALVE	8	2" FLOWMATIC CORP. EPOXY COATED DUCTILE IRON BRONZE TRIM, S.S STRAINER MODEL 302BT FOOT VALVE	
BILGE PUMP (P1)	1	MP HHLF 15 SELF-PR CENTRIF, 2"x2", 6.7" IMPELLER, 7.5 HP, 3PH, 3450 RPM TEFC MOTOR	BRONZE
STAND-BY BILGE PUMP/ FIRE PUMP (P2)	1	MP HHLF 15 SELF-PR CENTRIF, 2"x2", 6.7" IMPELLER, 7.5 HP, 3PH, 3450 RPM TEFC MOTOR	BRONZE
REACH ROD	1	ASSEMBLY BY ELLIOT MANUFACTURING	--
SIMPLEX STRAINER	2	KRAISSL SIMPLEX STRAINER MODEL 72	ASTM F-1199
DUPLEX STRAINER	2	KRAISSL DUPLEX STRAINER MODEL 72	ASTM F-1199
FLEXIBLE METALLIC HOSE	AS NEEDED		SAE J1942 SAE J-1475
SHAFT SUMP PUMPS (P3, P4)	2	DAYTON-GRAINGER 3YU7C SELF-PRIMING SUBMERSIBLE FLOAT-ACTUATED 1/2 HP PUMP	--

GENERAL NOTES

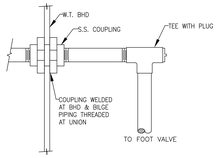
1. THIS DRAWING IS SCHEMATIC ONLY, AND DOES NOT INTEND TO LOCATE ANY PIPING, FITTINGS, OR EQUIPMENT EXCEPT IN GENERAL OR AS NOTED.
2. FINAL LOCATION OF ALL PIPES AND FITTINGS SHALL BE DETERMINED ON THE VESSEL TO BEST SUIT INSTALLATION.
3. SIZES ARE SHOWN AS MINIMUMS. IF NECESSARY, ADJUSTMENTS SHALL BE MADE AS REQUIRED BY THE EQUIPMENT AND SYSTEMS TO ASSURE SATISFACTORY OPERATION.
4. ALL VALVES CONTROLLING AN INDIVIDUAL SYSTEM SHALL BE GROUPED AS MUCH AS POSSIBLE.
5. ALL VALVES AND SYSTEMS SHALL HAVE IDENTIFYING MARKS AND LABELS.
6. ALL THROUGH-HULL CONNECTIONS SHALL HAVE VALVES FITTED AS CLOSE AS POSSIBLE TO THE HULL TO COMPLY WITH 46 CFR 56.50-95.
7. ALL VALVES SHALL BE LOCATED TO PROVIDE EASY ACCESS AT ALL TIMES.
8. ALL SYSTEMS SHALL BE INSTALLED WITH UNIONS TO PROVIDE FOR REMOVAL OF EQUIPMENT OR PIPE AND FOR SYSTEM CLEANING IN EACH WATER TIGHT COMPARTMENT.
9. THE BILGE MANIFOLD VALVES SHALL BE OF THE STOP-CHECK TYPE OR, STOP VALVE AND CHECK VALVE. IN ACCORDANCE WITH 46 CFR 56.50-50 (C).
10. THE BULKHEAD PIPING PENETRATION SHALL HAVE REINFORCEMENT AROUND THE PIPING AND BE WELDED ON BOTH SIDES OF THE PENETRATION (SEE DETAIL 5-A).
11. THE BILGE SYSTEM SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SUBCHAPTER T 46 CFR 182.5 AND APPLICABLE PORTIONS OF 46 CFR 56.50 AND 56.55.
12. EACH INDIVIDUAL BILGE SUCTION SHALL BE FITTED WITH A SUITABLE BILGE STRAINER HAVING AN OPEN AREA OF NOT LESS THAN THREE TIMES OF THE SUCTION PIPE.
13. THE SEA CHESTS SHALL BE FITTED WITH PORTABLE STEEL STRAINER PLATES FITTED AT THE OUTSIDE OF THE HULL SUITABLY PERFORATED. THE CLEAR AREA SHALL BE AT LEAST 3 TIMES THE COMBINED AREA OF ALL THE VALVES CONNECTED TO THE SEA CHEST.
14. EACH PUMP DISCHARGE SHALL BE FITTED WITH A PRESSURE GAUGE AND A PRESSURE RELIEF VALVE. WHERE REQUIRED.
15. ALL PIPING VALVES AND FITTINGS SHALL BE INSTALLED WITH REGARDS TO GOOD MARINE PRACTICE AND SUITABLE FOR ITS INTENDED PURPOSE. THE INSTALLATION, TESTING, AND WORKMANSHIP MUST BE TO THE SATISFACTION OF THE U.S. COAST GUARD OFFICER IN CHARGE MARINE INSPECTION (O.C.M.I.).
16. BILGE LEVEL ALARMS, VISUAL AND AUDIBLE, SHALL BE INSTALLED IN EACH HULL COMPARTMENT, AS REQUIRED. ALARM TO SOUND IN THE ENGINE ROOM AND IN THE PILOT HOUSE.
17. SYSTEMS SHALL BE DESIGNED WITH MEANS FOR COMPLETE DRAINAGE. ALL PIPE RUNS ON SLOPE FOR DRAINAGE WITH PIPE PLUGS OR CAPS AT LOW POINTS.
18. ALL THE VENTS ABOVE THE MAIN DECK SHALL BE PROVIDED WITH A BALL CHECK VALVE WHERE THE BALL FLOAT, NORMALLY IN THE OPEN POSITION, WILL FLOAT UP AND CLOSE UNDER THE ACTION OF A SUBMERGING WAVE.
19. THE BILGE & FIRE PUMP PERFORMANCE DATA & MOTOR SELECTION SHALL BE CONFIRMED WITH THE MANUFACTURER PRIOR TO PURCHASE.



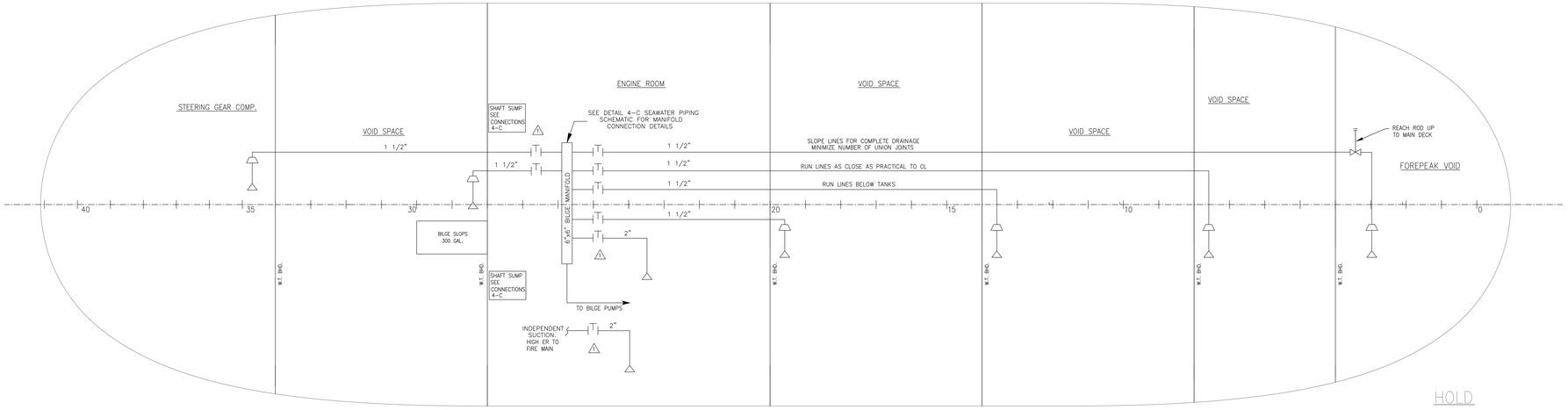
DETAIL 4-C
SEAWATER PIPING SCHEMATIC
NOT TO SCALE



DETAIL 5-B
CROSS SECTION OF SEA CHEST
NOT TO SCALE



DETAIL 5-A
TYPICAL PIPE PENETRATION DETAIL
NOT TO SCALE



HOLD

ALT	DESCRIPTION	DATE	NAME

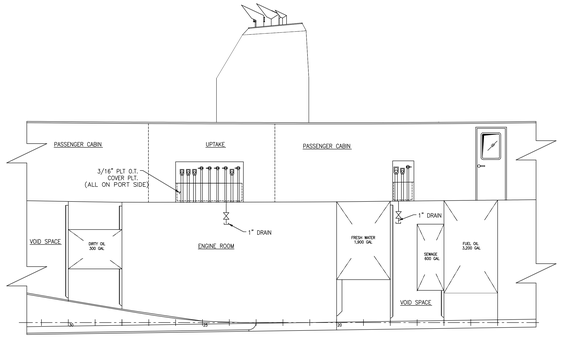
GILBERT ASSOCIATES, INC.
NAVAL ARCHITECTS MARINE ENGINEERS
100 GROSSMAN DRIVE BRAINTREE, MA 02184

104 FT LOA PASSENGER/VEHICLE FERRY

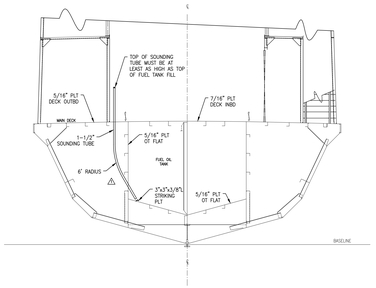
BILGE PIPE SCHEMATIC & SEA CHEST DETAILS

DRAWN BY KC DATE 05/12/2021
CHECKED BY JG DATE
APPROVED BY DATE
SCALE 3/8" = 1'-0"
DWG. NO. D367-P9 ALT. 1

SHEET 1 OF 1



FILL AND VENT – PROFILE VIEW



SOUNDING TUBE DETAIL
FRAME 15 LKG AFT

GENERAL NOTES

1) THIS DRAWING IS A SCHEMATIC ONLY AND DOES NOT INTEND TO LOCATE ANY PIPING, FITTINGS, OR EQUIPMENT EXCEPT IN GENERAL OR AS NOTED. FINAL LOCATION OF ALL PIPES AND FITTINGS SHALL BE DETERMINED ON THE SHIP TO BEST SUIT INSTALLATION.

2) SIZES SHOWN ARE FOR GUIDANCE ONLY. NECESSARY ADJUSTMENT SHALL BE AS REQUIRED BY THE EQUIPMENT AND SYSTEMS TO ASSURE SATISFACTORY OPERATION.

3) ALL DIAGRAMS, SPECIFICATIONS, AND RECOMMENDATIONS FURNISHED BY THE MANUFACTURERS OF EQUIPMENT SERVICED BY A SYSTEM SHALL SUPERCEDE THIS PLAN.

4) VENT PIPES FOR FUEL OIL TANKS SHALL BE SLOPED AS NECESSARY TO PROVIDE DRAINAGE TO TANK AND TO PREVENT POCKETING.

5) VENTS WITH "U" BENDS SHALL TERMINATE CLOSE TO THE HOUSE SIDES.

6) SOUNDING TUBES SHALL BE INSTALLED WITH STRIKER PLATES IN ACCORDANCE WITH GOOD SHIPBUIDLING PRACTICE.

7) TOP OF SOUNDING TUBES SHALL BE AT LEAST AS HIGH AS TOP OF TANK FILL.

8) WHERE SOUNDING TUBES TERMINATE BELOW THE BULKHEAD DECK, A SELF-CLOSING GATE VALVE SHALL BE INSTALLED IN ACCORDANCE WITH 46 CFR 56.50-90(b).

9) ALL VALVES AND SYSTEMS SHALL HAVE IDENTIFYING MARKS AND LABELS.

10) ALL VALVES SHALL BE LOCATED TO PROVIDE EASY ACCESS AT ALL TIMES.

11) ALL VALVES CONTROLLING AN INDIVIDUAL SYSTEM SHALL BE GROUPED AS MUCH AS POSSIBLE.

12) ALL CONNECTIONS BETWEEN THE PUMPS, ENGINES, AND PIPES SHALL BE FLEXIBLE.

13) FINAL FIELD INSTALLATION SHALL BE IN ACCORDANCE WITH GOOD SHIPBUILDING PRACTICES.

14) ALL SYSTEMS SHALL BE INSTALLED WITH UNIONS OR FLANGES TO PROVIDE FOR REMOVAL.

15) THE DECK AND BULKHEAD PIPING PENETRATIONS SHALL HAVE REINFORCEMENT AROUND THE PIPING AND SHALL BE WELDED ON BOTH SIDES OF THE PENETRATIONS.

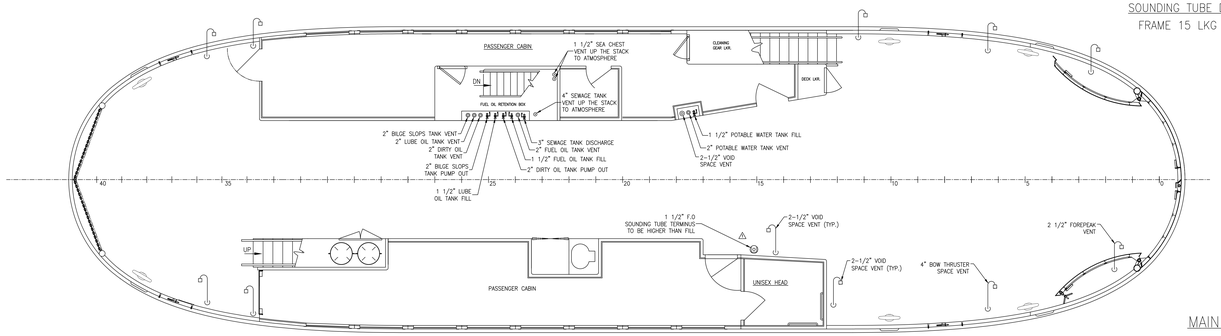
16) THE INSTALLATION, TESTING AND WORKMANSHIP MUST BE TO THE SATISFACTION OF THE OFFICER IN CHARGE, MARINE INSPECTION.

17) VENT OUTLETS FROM FUEL, FW, BILGE SLOPS, SEWAGE, DIRTY OIL TANKS SHALL BE FITTED WITH 30 BY 30 MESH SCREEN OF CORROSION RESISTANT WIRE.

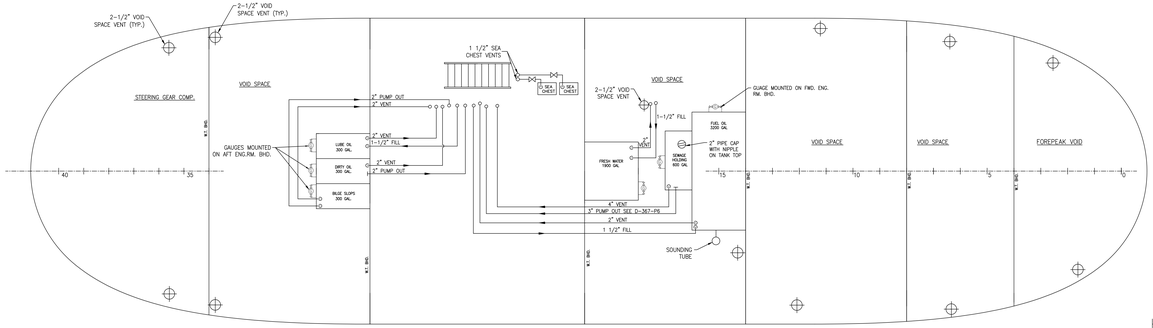
18) PROPER SUPPORTS SHALL BE PROVIDED FOR ALL PIPE RUNS AS REQUIRED BY THE REGULATORY BODIES AND ESTABLISHED MARINE PRACTICE.

BILL OF MATERIALS

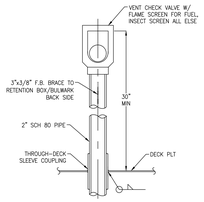
QTY.	SIZE	DESCRIPTION	MATERIAL	ASTM
AS NEEDED	1-1/2"ø	PIPE, SCH. 80, SEAMLESS	BLK STEEL	A 53
AS NEEDED	1-1/2"ø	ELBOW, SCH. 80, SEAMLESS	BLK STEEL	A 234
AS NEEDED	1-1/2"ø	TEE, SCH. 80, SEAMLESS	BLK STEEL	A 234
3	1-1/2"ø	VALVE, CHECK, MANUAL HANDLE	D.I.	A 395
16	1-1/2"ø	VALVE, GATE, MANUAL HANDLE	D.I.	A 395
AS NEEDED	2"ø	PIPE, SCH. 80, SEAMLESS	BLK STEEL	A 53
AS NEEDED	2"ø	ELBOW, SCH. 80, SEAMLESS	BLK STEEL	A 234
AS NEEDED	2"ø	TEE, SCH. 80, SEAMLESS	BLK STEEL	A 234
AS NEEDED	2-1/2"ø	PIPE, SCH. 80, SEAMLESS	BLK STEEL	A 53
AS NEEDED	2-1/2"ø	ELBOW, SCH. 80, SEAMLESS	BLK STEEL	A 234
AS NEEDED	2-1/2"ø	TEE, SCH. 80, SEAMLESS	BLK STEEL	A 234
AS NEEDED	1-1/2"x1"	CONCENTRIC REDUCER	BLK STEEL	A 234
AS NEEDED	2"x1"	CONCENTRIC REDUCER	BLK STEEL	A 234
AS NEEDED	2"x1-1/2"	CONCENTRIC REDUCER	BLK STEEL	A 234
AS NEEDED	--	EATON AEROQUIP FC234 FLEXIBLE HOSE	--	SAE J1942 SAE J1475
AS NEEDED	--	GEMS SURESIGHT – SIGHT GLASSES	--	--
AS NEEDED	2"ø, 2-1/2"ø, 4"ø	WINTEB WIN2000 HIAS THREADED VENT CHECK VALVE WITH SCREEN	--	--



MAIN DECK



HOLD



TYPICAL VENT DETAIL
SCALE 1 1/2" = 1'-0"

LEGEND

- TANK SOUNDING TUBE
- SOUNDING TUBE DECK FITTING
- PIPE RUN UP
- PIPE RUN DOWN
- PIPE RUN UP AND DOWN
- VENT WITH "U" BEND, BALL CHECK VALVE, AND REMOVABLE FLAME SCREEN
- GATE VALVE
- CHECK VALVE
- BALL VALVE
- LEVEL GAUGE
- PIPE CAP

ALT	DESCRIPTION	DATE	NAME
1	SOUNDING TUBES FOR THE BILGE SLOPS TANK DIRTY, OIL TANK, AND CLEAN LUBE OIL TANKS RETIRED FROM PLAN. SOUNDING TUBE FOR FUEL OIL TANK RELOCATED AND SET HIGHER THAN FUEL OIL TANK FILL	05/22	BKG

GILBERT ASSOCIATES, INC.
NAVAL ARCHITECTS
MARINE ENGINEERS
100 GROSSMAN DRIVE
BRAINTREE, MA 02184

104 FT LOA PASSENGER/VEHICLE FERRY

VENTS, FILLS, & SOUNDING TUBE PIPE SCHEMATIC & DETAILS

DRAWN BY KC DATE 06/23/2021
CHECKED BY JG DATE
APPROVED BY DATE
SCALE 1/4" = 1'-0"
DWG. NO. D367-P12 ALT. 1

DRAWING NOTE:
SET COLOR CYAN SCREENING TO 35

SHEET 1 OF 1