

REFERENCE DRAWINGS		
NO.	DRAWING TITLE	DRAWING NUMBER
1	GENERAL ARRANGEMENT PLAN	6094-8994-01
2	TANK ARRANGEMENT AND CAPACITY PLAN	6094-8994-02
3	COOLING WATER SYSTEM	6094-2500-01
4	AIR PIPES AND SOUNDING DIAGRAM	6094-5000-02
5	SANITARY FRESH WATER SYSTEM	6094-5300-02
6	COMPRESSED AIR SYSTEM	6094-5500-01
7	FIRE WATER EXTINGUISHING SYSTEM	6094-5500-03
8	OILY WASTE SYSTEM	6094-5500-04
9	SCUPPER AND DRAINS SYSTEM	6094-5500-05
10	BLACK, GREY WATER AND SANITARY FLUSHING SYSTEM	6094-5500-06
11	LEVEL ALARM DIAGRAM	6094-5700-01

PIPE DIMENSIONS					
PIPE CODE	PIPE SIZE	STANDARD	MATERIAL	REMARKS	JOINTS
8	12.0 x 2.0	DN20	Carbon steel	Galvanneal CLASS IIR	Flanges / Screwed fittings
15	25.4 x 3.6	DN24	Carbon steel	Galvanneal CLASS IIR	
20	28.9 x 3.2	DN24	Carbon steel	Galvanneal CLASS IIR	
40	48.3 x 3.8	DN24	Carbon steel	Galvanneal CLASS IIR	
50	60.3 x 3.2	DN24	Carbon steel	Galvanneal CLASS IIR	- Flanges
50	60.3 x 6.3	DN24	Carbon steel	Galvanneal CLASS IIR	
65	76.1 x 3.2	DN24	Carbon steel	Galvanneal CLASS IIR	
65	76.1 x 3.6	DN24	Carbon steel	Galvanneal CLASS IIR	
65	76.1 x 6.3	DN24	Carbon steel	Galvanneal CLASS IIR	- Flanges
80	88.9 x 3.2	DN24	Carbon steel	Galvanneal CLASS IIR	
80	88.9 x 6.3	DN24	Carbon steel	Galvanneal CLASS IIR	

VALVE MATERIALS					
NO.	NP	TEMP	VALVE TYPE	MATERIAL	L.R. CERT
8	10	40	PRESSURE GAUGE	BRASS	NO
20	10	40	GLOBE VALVE	CAST IRON	BRONZE DISC AND SEAT, BRASS STEM
20	10	40	SONR GLOBE VALVE	CAST IRON	BRONZE DISC AND SEAT, BRASS STEM
20	10	40	SELF-CLOSING VALVE	CAST IRON	BRONZE
40	10	40	ELECTRICAL REMOTE BUTTERFLY VALVE	DUCTILE IRON	ST. STEEL STEM, AL-BZ DISC, NBR SEAT
40	10	40	SWING CHECK VALVE	CAST IRON	BRONZE DISC AND SEAT
40	10	40	SWING CHECK VALVE	CAST IRON	AL-BZ DISC
50	10	40	ELECTRICAL REMOTE BUTTERFLY VALVE	DUCTILE IRON	ST. STEEL STEM, AL-BZ DISC
50	10	40	SWING CHECK VALVE	CAST IRON	BRONZE DISC AND SEAT, BRASS STEM
50	10	40	SWING CHECK VALVE	CAST IRON	BRONZE DISC AND SEAT
65	10	40	SONR GLOBE VALVE	DUCTILE IRON	BRONZE DISC AND SEAT
65	10	40	SONR GLOBE VALVE	DUCTILE IRON	BRONZE DISC AND SEAT
65	10	40	VALVE-ANGLED	BRONZE	BRONZE DISC AND SEAT, BRASS STEM
65	10	40	GLOBE VALVE	CAST IRON	BRONZE DISC AND SEAT
65	10	40	SONR GLOBE VALVE	BRONZE	BRONZE DISC AND SEAT, BRASS STEM
65	10	40	BUTTERFLY VALVE	DUCTILE IRON	ST. STEEL DISC AND SEAT
65	10	40	BUTTERFLY VALVE	DUCTILE IRON	ST. STEEL DISC AND SEAT, FIRE SAFE SEAT
65	10	40	BUTTERFLY VALVE	DUCTILE IRON	ST. STEEL DISC AND SEAT, AL-BZ DISC
80	10	40	BUTTERFLY VALVE	DUCTILE IRON	BRONZE DISC AND SEAT, BRASS STEM
80	10	40	BUTTERFLY VALVE	DUCTILE IRON	BRONZE DISC AND SEAT, BRASS STEM

EQUIPMENT TABLE			
ITEM	DESCRIPTION	CHARACTERISTICS	REMARKS
E520001	FIRE/BILGE SERVICE SELF PRIMING PUMP	Q=25m ³ /h; H=27m; P=6.4kW	
E520002	BILGE/FIRE SELF PRIMING PUMP	Q=25m ³ /h; H=27m; P=6.4kW	
E520003	BILGE EJECTOR	Q=25m ³ /h; H=3.5mWC; H ₂ =4.8 mWC	
E520006	DIAPHRAGM HAND PUMP	Q= 250 l/min; H=2 bar	PORTABLE
E520007	SELF PRIMING HAND PUMP WITH HOSE		
E520008	HOSE	One quick release coupling; L=8m	

TESTS TABLE			
ITEM	DESIGN PRESSURE (bar)	IN WORKSHOP (bar)	ON BOARD (bar)
PIPES	2.8	-	TIGHTNESS TEST FOR LEAKAGE UNDER OPERATIONAL CONDITIONS TO BE CONDUCTED IN THE PRESENCE OF L.R. SURVEYOR
VALVES ⁽¹⁾	X ⁽²⁾	-	

(1) TEST MADE BY THE VALVE SUPPLIER
(2) TO BE TESTED BY HYDRAULIC PRESSURE TO 1.5 TIMES THE NOMINAL PRESSURE RATING OF THE VALVE AT AMBIENT TEMPERATURE

CALCULATION REPORT

DIAMETER OF MAIN BILGE LINE (7.1.1 PART 15, CH 2 OF THE L.R. RULES AND REGULATIONS FOR THE CLASSIFICATION OF SPECIAL SERVICE CRAFT):































$$d = 1.88 \sqrt{(B+D) \cdot 25} = 1.88 \sqrt{(7.31+3.77) \cdot 25} = 61.65 \text{ (mm)} \Rightarrow d = \text{DN65}$$

DIAMETER OF BRANCH BILGE LINE (7.2.1 PART 15, CH 2 OF THE L.R. RULES AND REGULATIONS FOR THE CLASSIFICATION OF SPECIAL SERVICE CRAFT):

$$d = 2.15 \sqrt{(B+D) \cdot 25} = 2.15 \sqrt{(7.31+3.77) \cdot 25} = 33.97 \text{ (mm)}$$

PUMP CAPACITY (8.3.2 PART 15, CH 2 OF THE L.R. RULES AND REGULATIONS FOR THE CLASSIFICATION OF SPECIAL SERVICE CRAFT):

$$Q = \frac{5.75}{10^3} \cdot \frac{5.75}{10^3} \cdot 61.65^2 = 21.85 \text{ (m}^3\text{/h)} \Rightarrow Q = 25 \text{ m}^3\text{/h}$$

LEGEND:					
	PUMP		SONR GLOBE VALVE		PIPE SOCKET
	MANUAL PUMP		SONR GLOBE VALVE - ANGLED		SUCTION FUNNEL
	ELECTRIC MOTOR		CHECK VALVE		QUICK RELEASE COUPLING
	SELF PRIMING HAND PUMP		ELECTRIC ACTUATED VALVE		HOSE
	EDUCTOR		ELECTRICAL REMOTE BUTTERFLY VALVE		FLANGE CONNECTION
	BILGE SUCTION STRAINER		PNEUMATIC ACTUATED VALVE		PIPE CROSSOVER
	Y-TYPE STRAINER		SELF CLOSING VALVE (WEIGHT)		PIPE BRANCH
	MUD BOX		PRESSURE GAUGE COCK		PIPE FLOW DIRECTION
	GLOBE VALVE		REDUCTION PIECE		PRESSURE INDICATOR
	BUTTERFLY VALVE		PIPE PENETRATION		LEVEL SWITCH

NOTES:

- Valves in AMR and MMR must be grouped and placed in an accessible position.
- All valves shall have integral brass label plates securely attached to them in accordance with ASTM F992-86(2008) Standard specification for valve label plates.
- Piping must be protected against mechanical and vibration damage.
- Piping must be installed tension free and clean.
- Mechanical joints shall be avoided and used only where necessary to allow installation, maintenance, valves connections and equipment connections.
- All joints shall be welded except detachable joints (for exceptions see condition 5).
- No butt pipe system will pass over electrical components and in general, flange joints will be avoided in those areas.
- Stem box shall be arranged directly under floor plates for easy access by means of ladders.
- Pipe penetrations may be sleeved or flanged.
- The electrical remote controlled butterfly valve has an electrical actuator, rated voltage 1x115V, 60Hz power 40W, position indicator N/C, control type ON/OFF.
- Valves V520013 & V520014 shall be of an L.R. approved fire safe type.
- Eductor piping connection shall be installed according to maker's instructions.
- Funnel provided to collect oil from savealls.
- The mud boxes from machinery spaces will be placed in accessible places from above floor plates.
- In case of main power supply is interrupted, actuator shall move automatically to its (present) fail safe position (FC - Fail Close).

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CCGS PRIVATE ROBERTSON V.C			
Rev. 20/04/12	AS FITTED	TK	FP
Rev. Date	Description	Perform	Check
Client:	Title:		
CANADIAN COAST GUARD		BILGE DRAINAGE AND DOWATERING SYSTEM	
		MID-SHORE PATROL VESSEL	
IRVING SHIPBUILDING INC.		Scale: NTS	Sheet: 6094
P.O. Box 9110, 3099 Barrington Street, Halifax NS, Canada		Drawn by: M.S. Smith	Checked by: S. Hargrave
902-429-4510		Project No: 6094	Dwg. date: 15/05/2011
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Contract No: F7045-00001/00020		Sheet: 1 of 1	