CCGS Sir Wilfred Grenfell

68m Search and Rescue Vessel

Side Shell Access for Refrigeration Skid Install

OUTLINE SCOPE OF WORK

Doc. No. 16-155-001
Rev. 0

11 January 2017

Prepared For:

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DOCUMENT INFORMATION

Rev	Date	Description	Prepared	Checked	Approved
0	11 Jan 2017	Issued to CG for review and comment	DD	TW	-

REVISION SUMMARY

Rev	Affected Sections	Remarks	By

TABLE OF CONTENTS

1.0 PURPOSE

This document is intended to describe the scope of work to be completed by a qualified Contractor with respect to steel work and other tasks required for the installation of a new refrigeration unit in the auxiliary machinery room on CCGS *Sir Wilfred Grenfell*.

NOTE: The extent of steel crop and reinstatement as reflected in this specification is subject to approval by Transport Canada.

2.0 REFERENCE DRAWINGS AND DOCUMENTS

Annex A	Photographs
Annex B	Reference Sketches
Annex C	EP HVAC - Water Cooled Condensing Unit - EP-DWG-5787-WCCU-001

3.0 DEFINITIONS AND ABBREVIATIONS

Contractor	To Be Determined	Refit/Repairer
CCG	DFO - Canadian Coast Guard	Vessel Owner
PMC	Poseidon Marine Consultants Ltd.	Owner's Representative
TCMS	Transport Canada Marine Safety	Certifying Authority

4.0 GENERAL REQUIREMENTS

4.1 Acceptance of the Work

All work shall be completed to the satisfaction of CCG and TCMS.

The Contractor shall provide all welding procedures to TCMS, in accordance with the criteria listed below. The Contractor shall establish critical milestones at which the work may be inspected.

4.2 Materials and Welding

Plating and associated structure removed is to be reinstated as per original.

All new welding to be as per existing arrangement and shall be completed using electrodes as required for specific weld procedures.

4.3 Execution of the Work

In general, the Contractor shall progress repairs in a manner that:

- regards prevailing and forecasted weather conditions, such that CCG property and equipment is suitably sheltered where applicable.
- does not compromise the structural integrity of the vessel.
- enables periodic inspections of ongoing and completed work by CCG and TCMS.

In preparation for steel work, the Contractor shall:

- provide all ancillary services necessary to complete the subject modification. These may include, but are not limited to strip out, temporary removal of interference items within the aux. machinery room, craneage, staging, cleaning, debris removal, water, shore power, etc.
- remove insulation, fittings, fixtures, linings, machinery, etc. as required to complete installation of the refrigeration unit and the associated steelwork.

During the completion of hot work, the Contractor shall:

- supply fire watch while hot work is ongoing, with appropriate class portable fire extinguisher and charged fire hose ready for use.
- utilize existing seams/butts as practical when cropping and re-inserting shell plate. Where no butts/seams are present in the vicinity of new steel, corners to have a minimum of 100mm radius. Steel renewals are to follow good ship repair practices generally in accordance with IACS 47.
- subject work to inspection as coordinated with TCMS and CCG personnel.

Following the completion of hot work in specific areas of the vessel, the Contractor shall:

- have qualified person(s) complete ND testing, 100% visual and 100% UT of butts welds and subject work to final inspections by CCG and TCMS.
- clean affected spaces and remove debris from vessel.
- clean and apply primer to welded seams and other disturbed areas. Apply internal and external coatings as directed by CCG personnel.

5.0 SCOPE OF WORK

The Contractor is responsible for temporary removal of a portion of side shell and associated structure in way of the auxiliary machinery room so that one (1) EP HVAC refrigeration unit supplied by Canadian Coast Guard can be placed aboard. Once aboard, the side shell and structure are to be fitted in place and re-welded as per original. The Aux. Machinery Room is located below the main deck level port side forward. Areas indicated are approximate and shall be confirmed onsite by the Contractor prior to renewal, in conjunction with CCG personnel or approved designate.

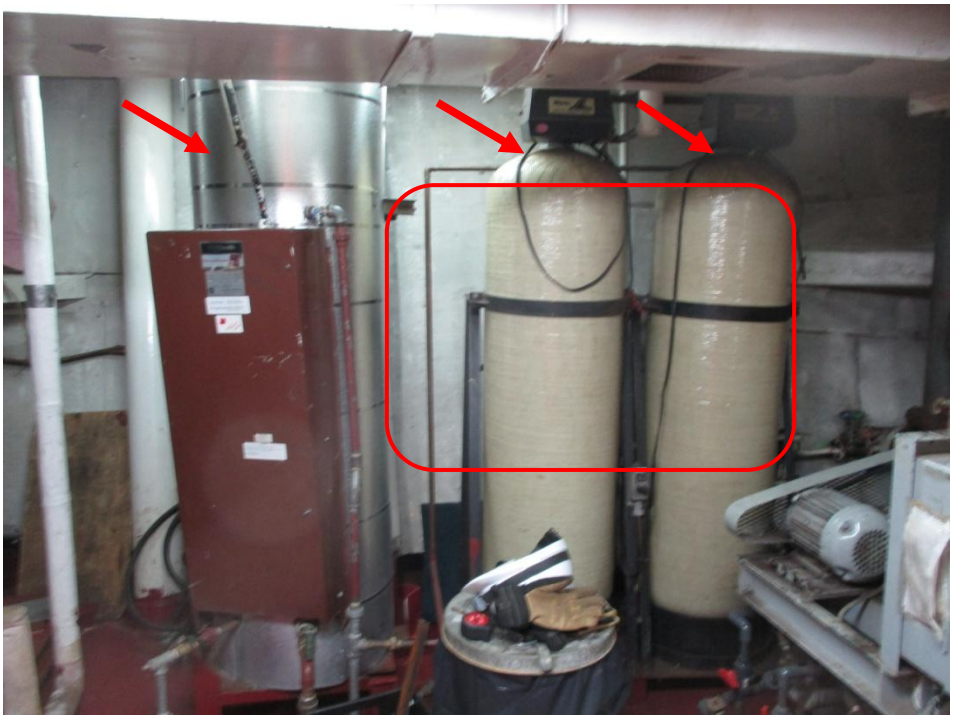
5.1 Installation of the Refrigeration Unit in the Aux Machinery Room

As illustrated on page 12 of this document, an access hole has been previously cut in the side shell of the vessel in way of the auxiliary machinery room. It is the intent of this document to give the Contractor sufficient information to re-use the same access hole by utilizing existing butts and seams such that this access hole can be properly removed and re-inserted to allow installation of the refrigeration unit.

5.1.1 Side Shell Plate

	Longitudinal Extent	Transverse Extent	Reference	Approx. Area	Shell Plate Thickness
a.	Approx. Frame 85 1/2 to 89 1/2	Ship side shell plate - port side	Annex A & B	$36ft^2$ Approx. weight of plate and associated stiffening 1.0 tonnes	19mm

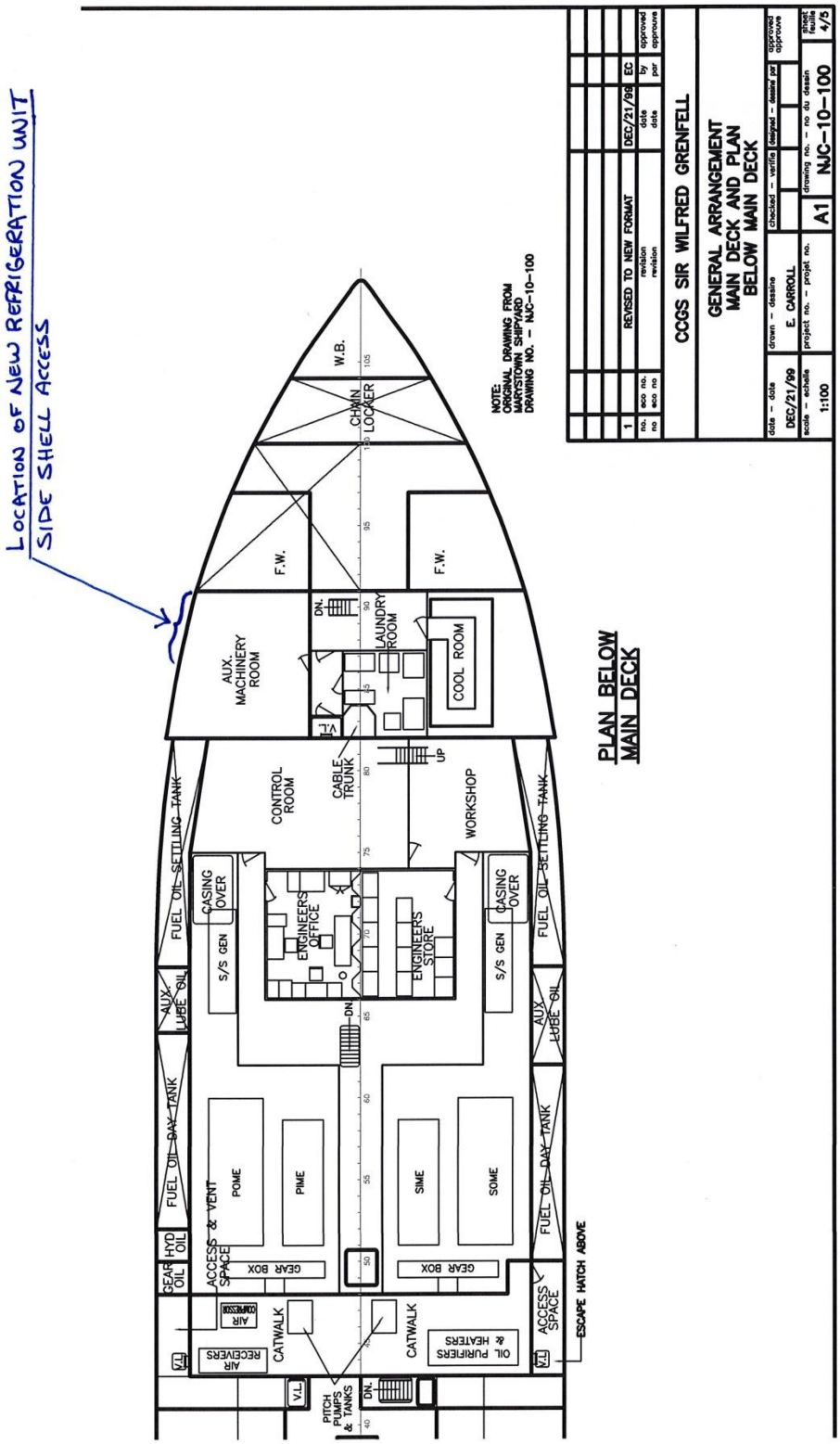
ANNEX A
PHOTOGRAPHS

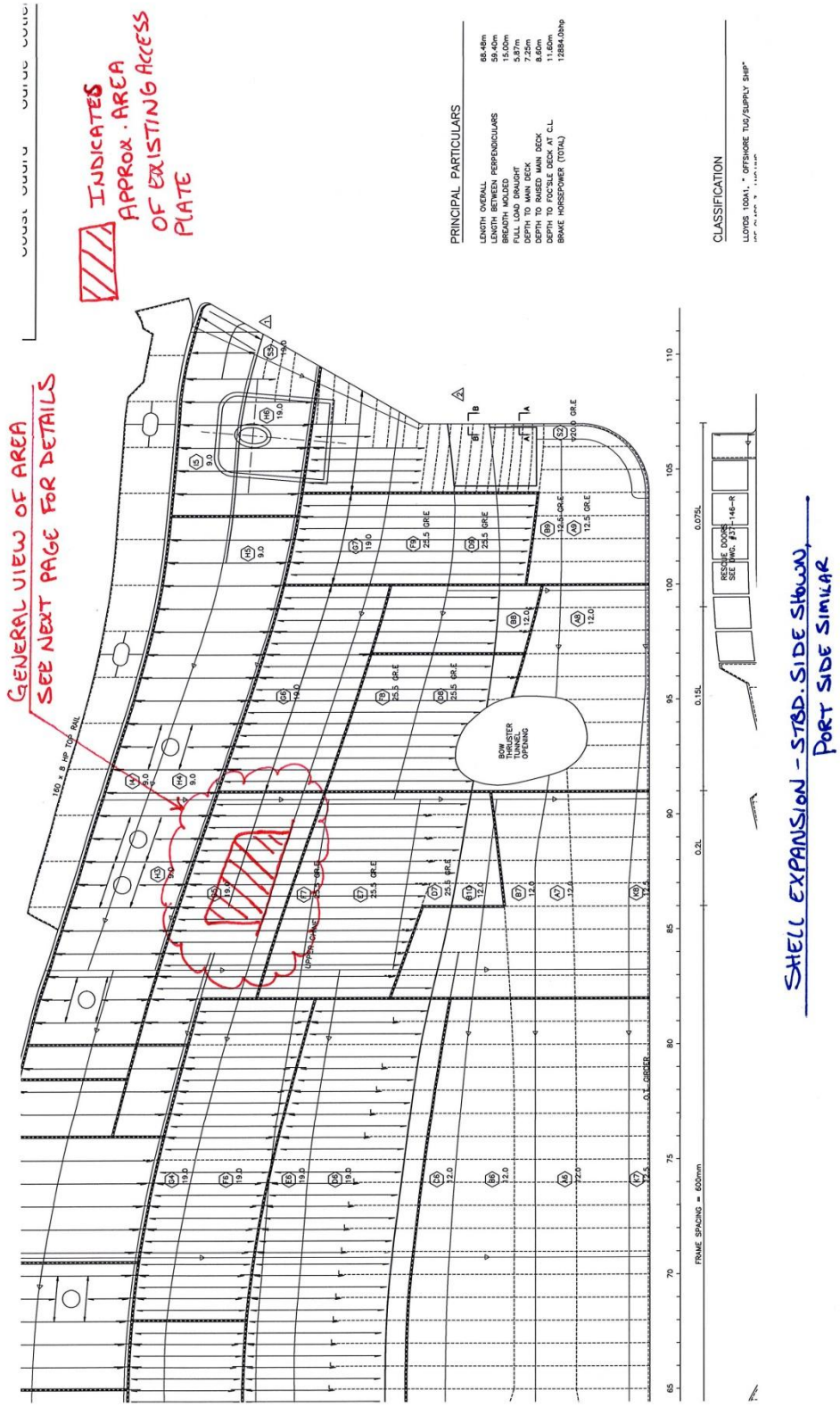


Photograph #1: Aux. Mach. Room - view looking outboard
Arrows indicate interference items to be temporarily removed
Line indicates approximate location of access hole to be cut in side shell

Photograph #2: Aux. Mach. Room - General view looking forward

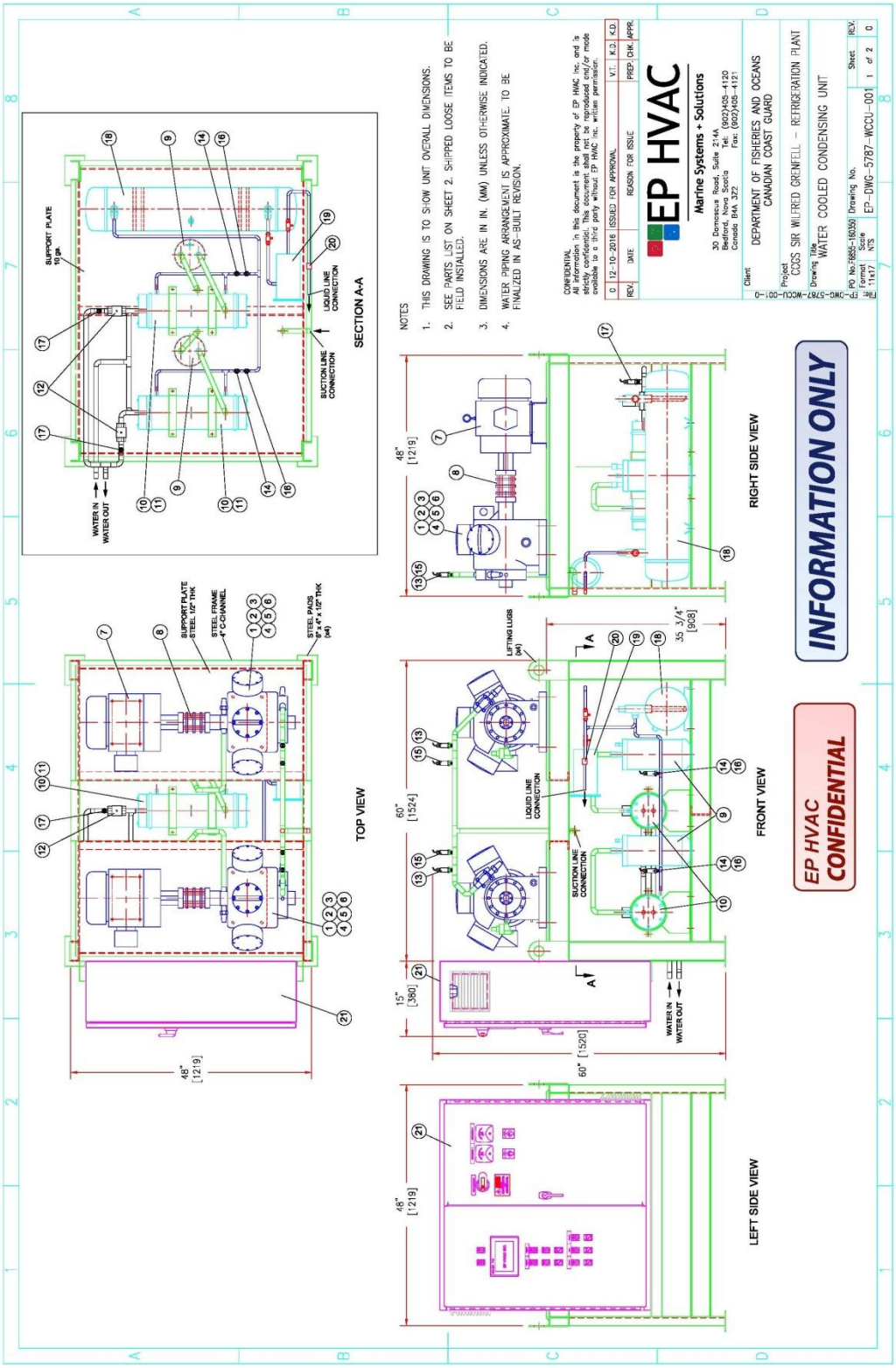
ANNEX B
REFERENCES SKETCHES


LOCATION OF NEW REFRIGERATION UNIT
SIDE SHELL ACCESS
W.B.
CHAIN LOCKER
F.W.
F.W.
AUX. MACHINERY ROOM
LAUNDRY ROOM
COOL ROOM
CONTROL ROOM
CABLE TRUNK
WORKSHOP
ENGINEERS OFFICE
ENGINEERS STORE
CASING OVER
S/S GEN
FUEL OIL SETTLING TANK
AUX. LUBE OIL
FUEL OIL DAY TANK
HYD OIL
GEAR OIL
POME
PIME
SIME
SOME
ACCESS & VENT SPACE
GEAR BOX
CATWALK
AIR COMPRESS
AIR RECEIVERS
OIL PURIFIERS & HEATERS
PITCH PUMPS & TANKS
ESCAPE HATCH ABOVE
PLAN BELOW MAIN DECK
NOTE: ORIGINAL DRAWING FROM LAMPSON SHIPYARD DRAWING NO. – NJC-10-100
CCGS SIR WILFRED GRENFELL
GENERAL ARRANGEMENT MAIN DECK AND PLAN BELOW MAIN DECK
REVISED TO NEW FORMAT
DEC/21/99
E. CARROLL
1:100
A1
NJC-10-100
4/5


INDICATES APPROX. AREA OF EXISTING ACCESS PLATE
GENERAL VIEW OF AREA
SEE NEXT PAGE FOR DETAILS
PRINCIPAL PARTICULARS
LENGTH OVERALL 68.48m
LENGTH BETWEEN PERPENDICULARS 59.40m
BREADTH MOULDED 15.00m
FULL LOAD DRAUGHT 5.97m
DEPTH TO MAIN DECK 7.25m
DEPTH TO RAISED MAIN DECK 8.60m
DEPTH TO FOC'SLE DECK AT C.L. 11.60m
BRAKE HORSEPOWER (TOTAL) 12884.0bhp
CLASSIFICATION
LLOYDS 100A1, " OFFSHORE TUG/SUPPLY SHIP"
160 x 8 HP TOP RAIL
BOW THRUSTER TUNNEL OPENING
UPPER DECK
RESCUE DOORS SEE DWG. #31-146-R
FRAME SPACING = 600mm
SHELL EXPANSION - STBD. SIDE SHOWN, PORT SIDE SIMILAR


PORT SIDE - VIEW FROM WHARF
FWD
AFT
EXISTING WELD SEAM
RADIUS CORNER
RELEASE WELD
EXISTING SEAM
EXISTING ACCESS PLATE TO BE USED FOR INSTALL OF REFRIGERATION UNIT
EXISTING BUTT WELD
BULKHEAD IN AUX. MACH ROOM FR. 91
REF POINT EXISTING OVERBOARD

ANNEX C
EP HVAC UNIT


SECTION A-A
TOP VIEW
RIGHT SIDE VIEW
FRONT VIEW
LEFT SIDE VIEW
NOTES
1. THIS DRAWING IS TO SHOW UNIT OVERALL DIMENSIONS.
2. SEE PARTS LIST ON SHEET 2. SHIPPED LOOSE ITEMS TO BE FIELD INSTALLED.
3. DIMENSIONS ARE IN IN. (MM) UNLESS OTHERWISE INDICATED.
4. WATER PIPING ARRANGEMENT IS APPROXIMATE. TO BE FINALIZED IN AS-BUILT REVISION.
EP HVAC
Marine Systems + Solutions
DEPARTMENT OF FISHERIES AND OCEANS CANADIAN COAST GUARD
CCGS SIR WILFRED GRENFELL – REFRIGERATION PLANT
WATER COOLED CONDENSING UNIT
INFORMATION ONLY
EP HVAC CONFIDENTIAL

Item No.	Equipment Name	Manufacturer /Supplier	Model /Serial number	Size in.	Reference Specification
Water Cooled Condensing unit					
	Water Cooled Condensing unit Skid	EPHVAC INC.	5787-WCCU-001	75 x 48 x 60	Sea water cooled dual condensing unit 2 x 8.34 kW capacity. Skid mounted with direct drive motor driven compressors, receiver, sea water cooled marine condensers, control panel, necessary piping and on skid wiring suitable for installation in enclosed non-hazardous area, circuit breaker. Sea water temperature: 32°C 460V/3ph/60 Hz. Refrigerant R407A Local Control Panel mounted on condensing unit skid. Maximum dimensions: 75"L x 48"W x 57"H.
1	Compressor	Carlyle/Carrier	5F30C66401 S/N 3516400398		Reciprocating open type compressors, suction & discharge stop valves, step capacity control, crankcase heater, refrigerant pressure transmitters, oil pressure switch, glyceryn filled gauges.
2	Crankcase Heater	Carlyle	5F20381		Crankcase Heater element, 115 V, 100 W.
3	Capacity Control	Carlyle	5F20A752		Capacity Control Package
4	Oil Safety Switch	Johnson Controls	P45	5 5/8x3 1/4x2 3/8	Oil pressure cutout controls with built-in time delay relay: 7-60 Psi pressure range, 36" Lg. capillary with 1/4" flare nuts, 120/240 Volts, manual reset.
5	Service valve - Discharge				Service valve - Discharge included with compressors
6	Service valve - Suction				Service valve - Suction included with compressors
7	Motor	Marathon	RVD213TTFC6026 S/N 450063598-14800037	11.5 dia. x 18.23 L	TEFC 460/3/60 motor, 7.5 HP/5.6 kW/9.6 Amps/1800 RPM, drive couplings with coupling guards,
8	Coupling	Carlyle	5F20-847	1 3/8 dia. shaft	Motor drive flexible coupling for 7.5 HP motor, 1.375" shaft.
9	Oil separator	Refrigeration Research	8413	13 1/2 x ø6	Oil Separator, nominal 14 tons, 1 1/8" discharge line, 3/8" oil return line.
10	Condenser	AlfaLaval	MSE500Z S/N N40914	ø3/4 water connections	Sea water condenser, 90/10 CuproNickel tube (max. 150 psi @ 66°C) and tube sheets (max. 400 psi @ 66°C), nominal flow rate 13.2 gpm, water pressure drop 5.1 psi, pumpdown capacity 13 lbs, minimum operating charge 1.43 lbs. Liquid 5/8", Suction 1 1/8", Relief 3/8".
11	Relief valve	Mueller	AR 15502	3/8 x 3/8	Pressure Relief valve, straight thru type, NPTFE inlet to flare outlet, -40°C to 149°C temperature range, 150 to 700 Psi working pressure, setpoint 265 Psig,
12	Water Regulating valve, marine type	Johnson Controls	V-46BC-2C S/N RY21504	ø3/4 NPT threaded connection	2-way Maritime type Water Regulating Valve, Johnson Controls V46 type, threaded connection, element style 34, 30" copper capillary with 1/4" flare nut, open on rise, 150 Psi max. water pressure
13	Refrigerant Pressure Switch	United Electric Controls	10-G-10-M512	1 1/4 dia. x 3 7/8" L	Refrigerant Low Pressure Switch, Aluminum enclosure, -18°C to 71°C temperature range, one SPDT output, adjustable setpoint 4 to 50 Psi, c/w optional 1/4" NPT brass pressure connection, 5 Amps 250 VAC, UL recognized, CSA certified.
14	Refrigerant Pressure Switch	United Electric Controls	10-G-12-M512	1 1/4 dia. x 3 7/8" L	Refrigerant High Pressure Switch, Aluminum enclosure, -18°C to 71°C temperature range, one SPDT output, adjustable setpoint 30 to 600 Psi, c/w optional 1/4" NPT brass pressure connection, 5 Amps 250 VAC, UL recognized, CSA certified.
15	Refrigerant Pressure Transmitter	Dwyer	628CR-10-GH-P1-E1-S1	3/4 dia. x 3 1/4" L	Refrigerant Low Pressure Transmitter, ceramic sensor housed in NEMA4X stainless steel body, -18°C to 79°C temperature range, 0-100 psi pressure range, 4-20 mA signal output, 1/4" NPT connection, NEMA4X (IP66).
16	Refrigerant Pressure Transmitter	Dwyer	628CR-14-GH-P1-E1-S1	3/4 dia. x 3 1/4" L	Refrigerant High Pressure Transmitter, ceramic sensor housed in NEMA4X stainless steel body, -18°C to 79°C temperature range, 0-500 psi pressure range, 4-20 mA signal output, 1/4" NPT connection.
17	Water Pressure Switch	United Electric Controls	10-G-10-M512	3/4 dia. x 3 1/4" L	Water Pressure Switch, Aluminum enclosure, -18°C to 71°C temperature range, one SPDT output, adjustable setpoint 4 to 50 Psi, c/w optional 1/4" NPT brass pressure connection, 5 Amps 250 VAC, UL recognized, CSA certified.
18	Liquid Receiver	AlfaLaval	RBV4285MP S/N 521939	5 5/8 dia. x 42" L	Liquid Receiver, horizontal, 73 lbs pumpdown, inlet 1 1/8" IDS, outlet 1 1/8 IDS, safety 1/2" FNPT, 675 Psi working pressure
19	Liquid line Drier	Sporlan	Drier C-485-G T/C, Core RC-4864	ø 5/8 ODF Solder	Filter/Drier, Replaceable core, 650 psi maximum working pressure.
20	Sight Glass	Sporlan	SA-14S	ø 1/2 ODF Solder	Moisture & Liquid Indicator
21	Local Control Panel	Techniserv		42 x 42 x 12	Refrigeration control panel mounted on the condensing unit frame, NEMA 12 Enclosure, incorporated temperature controler per room, with temperature display in the panel door, ammeter for compressors motors c/w phase selector switches and current transformers, pulldown control and high pressure alarm included with HMI Beiger T7A, defrost timer included in PLC programming, fan start delay, manual start/stop switch, fault indication, spare fuses kit.

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INFORMATION ONLY

REV.	DATE	REASON FOR ISSUE	PREP.	CHK.	APPR.
0	12-10-2016	AS BUILT	V.T.	K.D.	K.D.

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Client: DEPARTMENT OF FISHERIES AND OCEANS CANADIAN COAST GUARD

Project: CCGS SIR WILFRED GRENFELL – REFRIGERATION PLANT

Drawing Title: WATER COOLED CONDENSING UNIT

PO No.:F6855-160350 Drawing No.: EP-DWG-5787-WCCU-001 Sheet: 2 of 2 REV.: 0

Format 11x17 Scale NTS

File: EP-DWG-5787-WCCU-001-0