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SOLICITATION AMENDMENT
MODIFICATION DE L'INVITATION

The referenced document is hereby revised; unless otherwise indicated, all other terms and conditions of the Solicitation remain the same.

Ce document est par la présente révisé; sauf indication contraire, les modalités de l'invitation demeurent les mêmes.

Comments - Commentaires

Vendor/Firm Name and Address
Raison sociale et adresse du fournisseur/de l'entrepreneur

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Title - Sujet Drydocking - CCGS Alfred Needler	
Solicitation No. - N° de l'invitation F5561-150892/A	**Amendment No. - N° modif.** 003
Client Reference No. - N° de référence du client F5561-15-0892	**Date** 2015-12-11
GETS Reference No. - N° de référence de SEAG PW-$HAL-403-9679	
File No. - N° de dossier HAL-5-75191 (403)	**CCC No./N° CCC - FMS No./N° VME**
Solicitation Closes - L'invitation prend fin **at - à 02:00 PM** **on - le 2015-12-22**	**Time Zone** **Fuseau horaire** Atlantic Standard Time AST
F.O.B. - F.A.B. **Plant-Usine:** ☐ **Destination:** ☑ **Other-Autre:** ☐	
Address Enquiries to: - Adresser toutes questions à: Brow, Theresa	**Buyer Id - Id de l'acheteur** hal403
Telephone No. - N° de téléphone (902) 496-5166 ( )	**FAX No. - N° de FAX** (902) 496-5016
Destination - of Goods, Services, and Construction: **Destination - des biens, services et construction:**	

Instructions: See Herein

Instructions: Voir aux présentes

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Name and title of person authorized to sign on behalf of Vendor/Firm (type or print) **Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)** **Signature** **Date**	

Canada

MINUTES OF
BIDDERS CONFERENCE
CCGS ALFRED NEEDLER

Requisition number: F5561-150892

A Bidders Conference for CCGS ALFRED NEEDLER, was held at REGIONAL MARITIME HEADQUARTERS BUILDING, 50 Discovery Drive, Dartmouth, Nova Scotia at 10:00 HRS hrs on December 9, 2016.

The following persons were in attendance:

Theresa Brow	Contract Authority	PWGSC
Todd Smith	Sr. Vessel Maintenance Manager	Canadian Coast Guard
Jonathan Summers	Vessel Maintenance Manager	Canadian Coast Guard
Darryl Landry	Production Manager	Canadian Coast Guard
Darren Kennedy	Chief Engineer	CCGS Alfred Needler, CCG
Aubrey Brushett	Snr. Engineer,	CCGS Alfred Needler, CCG
Dawn MacEwan	Commanding Officer	CCGS Alfred Needler, CCG
Mark Roebothan	Contracts/Estimating	New Dock Shipyard
George Penny	Contracts Manager	New Dock Shipyard
David Cluett		Irving Shipbuilding Ind.
Brandon Hart		Irving Shipbuilding Ind.
Stewart Hunter	Estimator	Irving Shipbuilding Ind.
Mark Staratt	Tech Support	Jastram
Michael Rankin	Client Dev. Manager	Pennecon Energy
Matthew Weckman	Mechanical Engineer	Aspin Kemp & Associates
Zack MacDonald	Business Dev. Officer	Aspin Kemp & Associates

Public Opening

The Tender will close and a public opening will be held at 2:00 P.M., December 22, 2016

Delivery

The work period is currently scheduled for:

January 5, 2016 to 22 February 2016

There are currently no other site visits planned for this refit. Any questions or requests for additional visits are to be directed to the Contracting Authority.

Quality Assurance

The requirement is reaffirmed for the Contractor to comply with the requirements of an ISO Quality Management System or have a quality system that addresses the requirements contained in that standard.

Tender Deliverables

Bidders were reminded that Part 5 – Certifications lists deliverables that must accompany the bid in order for the bid to be deemed responsive. Bidders should expect that Deliverables listed if not provided with the bid will be requested to be provided within 24 hours of notification.

Tender review:

No concerns or issues were raised in regards to the tender document**.**

A discussion was made after the meeting the extra manhours will be increased to 3000 manhours on Annex I – Financial Bid Presentation Sheet which is attached.

Safety Program

The Contractor must work in accordance with Canada Labour Code with respect to safety and security and this must be demonstrated in the Contractor's Safety Program

Pricing Data Sheets

The Pricing Data Sheets provided with these minutes are to be completed and returned with the tender documents.

SPECIFICATION REVIEW 15-A018-013-1:

There is a new French and English specification which was posted on BuyandSell on Monday, December 7, 2015. All bidders present were provided a CD with the new specification, Listed Appendices, and drawings.

TSMSB costs will be billed directly to CCG therefore contractor is not responsible for these costs.

GENERAL NOTES

No concerns or issues were raised.

SERVICES

6. Electrical Power: 600 volt, 400 amp

11. Protection: para 2 contractors are to quote on 1000 sq. feet.

PRODUCTION CHART & SUBCONTRACTOR ALLOWANCES

Subcontractor allowances will be paid upon presentation of original invoice. Allowances will be adjusted according to these invoices.

HD-01 DOCKING & UNDOCKING

Add: 22. Poker gauge readings to be taken within four (4) hours of docking. A manlift will be required.

VTC costs have been re-verified and are attached to this document.

HD-02 BUTTS & SEAMS

No concerns or issues were raised

HD-03 UNDERWATER HULL PAINTING

2.1.20 - what are the diameter of these screws? The Contractor shall quote separately, the cost of replacing, with new, 32 grid screws (3/4" UNC X 3 ½") for forward grids and 6 (3/8" UNC X 2") screws for the aft grid. All screws are to be hex keyed flat headed machine screws

2.1.4: If the International Paint FSR has NACE certification, they can also be used for inspections required in HD-09.

13. Sweep the remaining 50% to get profile.

HD-04 HULL ANODES

No concerns or issues were raised.

HD-05 BALLAST TANKS

2.1.6: To clarify, the rusty and bare areas are the same as the agreed upon area defined in paragraph 2.1.5.

HD-06 RUDDER GLAND PACKING

No concerns or issues were raised

HD-07 FUEL TANKS SURVEY

Specify the % or surface M2 which must be mechanically cleaned to SSPC-SP3

75% to be adjusted via 1379, but I don't know the surface area of the tanks. For ALL tanks CCG would like the area to be prepared based on an agreement between CGTA and shipyard prior to commencing SSPC-SP3 cleaning.

2.1.11: Note Pneumatic test is preferred by CCG and Contractors due to costs associated, however TCMSB may require Hydrostatic, hence requesting pricing for both. Only one will be performed. Bid price is to include the cost of pneumatic test and will be adjusted by DSS 1379 action if hydrostatic is required.

HD-08 ULTRASONIC THICKNESS MEASUREMENTS

A New specification was presented to the bidders present and will be attached to these minutes.

The repair specification from Lengkeek Vessel Engineering (Appendix B), regarding frame renewals based on the UTM report provided by TEAM last summer has our answer.

Note section 4.3 beginning at the bottom of page 7; The shaft tunnel is discussed, and it is pointed out that Frame 12 is depleted more than any others in that space. This frame is highlighted in the TEAM UTM report giving the impression it is degraded beyond acceptable limits, however it is still acceptable in accordance with Lloyd's Register.

TC has agreed to remove the requirement for removal of concrete in this area is we can't seem to find a statement indicating we are explicitly required to remove this concrete in order to complete UTM in the area, and doing so makes no logical sense. Instead, we will follow Lengkeek's recommendations and perform further UTM on the accessible framing in this space, and consider repairs if necessary based on updated readings.

Therefore, the note regarding concrete removal may be deleted.

1. 2.1.2: To facilitate taking UTM at the watertight bulkhead in fwd. of Engine room at frame 49, in way of (IWO) items to be moved and refurbished. For reference to refer to photos and PDF titled HD-08 attached.

List of items for temporary removals are:

a) Deck Plates (3 aluminum deck plates – bolted to frames)
b) Deck Plate Frames IWO (8 steel cuts / re-weld for flat bar and angle iron, 2 bolts for a pipe bracket, 2 bolts to undo handrail on port side)
c) Remove Main Seawater line from Port to Stbd Sea chests and all-inclusive valves and first pipe section. This includes Seawater Strainers (P&S), Isolation Valves for Sea strainers (4), Tee Pipe Sections (2), Valves for ROD, ME suction, #1&#2 Ship Service Diesel Generator (SSDG) SW Suctions (2), a ME Fuel oil cooling, a SW Suction to Bilge Manifold, an AC Unit SW Cooling, a Sanitary Pump suction, an Evaporator suction, and the ME Stby SW pipes (2 sections).
d) Remove lower Recirculation Manifold (Crossover) pipes and isolation valves, this includes a port recirc valve, a stbd recirc valve, a ME recirc valve and a SSDG recirc valve.
e)

1. Contractor shall disassemble, blast and coat both Seawater strainers with same paint scheme as Underwater Hull Paintings HD-03 para 2.16. Approximate total surface area for internal and external of both strainers and covers is 12m^2.

2. Contractor shall renew two Seawater vent ball valves, both Seawater strainer bolts and cover gaskets to be renewed.

3. Contractor shall temporarily remove at least the first section of each pipe from each valve listed above in c) and d) to allow more access to the frames and Engine room bulkhead. Contractor shall renew gaskets and pipe joint sealants. Refer below for Hull Valves for sizes and type.

4. Contractor shall open and lap in all valves on these manifolds for TCMSS inspections and survey credit. Repairs shall be covered under 1379 Process. All valves under 2" shall be renewed in lieu of overhaul as deemed to be cost effective.

SEA SUCTIONS & VENT VALVES:

a) Stbd sea box isolating	8" Gate
b) Stbd Strainer Iso. V/v	8" Globe
c) Port sea box isolating	8 "Gate
d) Port Strainer Iso. V/v	8" Globe
e) Stbd. re-circulating	5" Globe
f) Port re-circulating	3" Globe
g) Port #1 generator suction	2" Globe
h) Main engine suction	6" Globe
i) Stbd. #2 generator suction	2" Globe
j) Sanitary pump suction	1-*1/2"* SDNR (Renew)
k) Bilge pump suction	2" Globe
l) Evaporator suction	5" Globe
m) ROD suction	3" Globe
n) Sea box vent Stbd.	2" Globe
o) Sea box vent Port	2" Globe
p) Stbd Strainer air valve	1" Ball (Renew)
q) Port Strainer air valve	1" Ball (Renew)
r) Control Room AC Suction	1" Globe (Renew)
s) Fuel Cooling Suction	2" Globe
t) Ship Service Generator Recirc.	3" Globe

HD-09 STBD. FRESH WATER TANK REPAIRS

HD-09 – New revised specification is attached to these minutes.

HD-10 FRAMES RENEWAL

1. Par 4 – It is believed that this is 18" not feet?

2. Frames renewal – Specify the diameter of the 6 valves mentioned in point 6. Frames renewal : Frames renewal 2 x – 8" SDSL globe v/v, 2x – 8" gate v/v, 2x – 5" SDSL globe v/v

3. Could you specify for all bidders a surface to be cleaned in bilge area and workshop/ sewage tank area? Also, specify a quantity of oily water in bilge to be pumped out.

   all steel work repair should be part of Lengkeek specification. The paragraph is confusing. As far as framing goes, 3 or 4 frames need replacing from the fresh water tank bulkhead to the next longitudinal which is approximately 3'6" length. The 18' they refer to should read 18"

and they are talking about bulkheads, and yes it will more than likely be taller than 18" that needs replacing. Again, this should be part of Lengkeek spec, not ours, delete it from ours

HD-11 CATHODIC SYSTEM

No issues or concerns were raised.

HD-12 ACDP REMOVAL

HD-12 – Para 4 Typo in spec says "ADCP Transducer "Renewal" should be "Removal"

HD-13 DRAINS TANKS

No issues or concerns were raised.

HD-14 STERN RAMP REPAIRS

HD-14 – Will modify to include questions

Para 1 - There is no insulation

Para 5 - Area to bid on is 200 linear feet and provide unit cost.

HD-15 ABOVE WATERLINE HULL PAINTING

HD-15 – Cancelled at Bidders Conference

H-01 BERTHING

No issues or concerns were raised.

H-02 EMERGENCY BOAT DAVID INSPECTION

H-02 – See "Schat Lifeboat Davit" attachment

Specify the quantity of oil to be drained and disposed? 5 litres

H-03 HIAB CRANE INSPECTION AND OVERHAUL

H-03 – CANCELLED

H-04 #1 FUEL TANK VENT RENEWAL

Paragraph 2.1.8 discusses painting in accordance with spec item HD-15, which is cancelled. Add the following:

8a. All disturbed areas and new pipes shall be brush-off sandblast cleaned to SSPCSP-7 standard. Any bare or corroded areas revealed shall be subsequently blasted to near white SSPC-SP-10 standard. Areas blasted to near white shall be feathered back a minimum of 150 mm to sound and fast coating material. If feathering is not achievable by blasting, all said areas shall be feathered by power tool grinding. Contractor shall quote on blasting 40% of the topside surface area to near white standard.

8b. The following painting schedule shall be supplied and applied by the Contractor:

First Coat: 3 mils D.F.T., INTERPRIME 198 – Grey

Second Coat: 3 mils D.F.T., INTERPRIME 198 – White.

Third Coat: 2 mils D.F.T., INTERSHEEN 579 – Storm Grey.

Fourth Coat: 2 mils D.F.T., INTERSHEEN 579 – Colour to Match Existing: CCG Red (RAL 3000); White (RAL 9003); Beige (RAL 1001); Black (RAL 9004)

H-05 CABLE TRANSIT REPAIRS

No concerns or issues were raised

E-01 ANCHOR WINDLASS

E-01 – Manual is aboard the vessel. I will be scanning a copy later today or tomorrow. Amendment #1 on Buy & Sell regarding 2.1.29 to be integrated to future revision of spec.

E-02 ANCHORS & CHAINS

No concerns or issues were raised

E-03 CHAIN LOCKER

What area would require SSPC-SP3 treatment? E-03 – For clarification: The area of preparation required in 2.1.7 will be approximately 80% of the total area of the space, which is estimated at 45m2. CGTA and Contractor need to agree on an area and sign the 1379 with price prior to work commencing…

Confirm that the SSPC-SP3 treated areas are the only areas getting painted this year?
As for the paint required in paragraph 2.1.8, the first three coats will be apply to the areas prepared as per paragraph 2.1.7, and the final coat will be applied to 100% of the internal surface.

E-04 VENTILATION CLEANING

Guidance Drawings 761/02 1 and 2, have been forwarded to all bidders.
E-04 – I've found sheet 2 of 2 (Attached)… Sheet 1 is currently MIA

E-05 BITTER END MODIFICATIONS

E-05 – Contractors are to bid on this item as is.

E-06 #1 FIRE & GENERAL SERVICE PUMP SURVEY.

Particulars of the electric motor requested. Pictures of the name plates were provided.

There being no further business to discuss the meeting adjourned at 11:30 a.m.

Theresa Brow
Marine Supply Specialist
Public Services & Procurement Canada.

ANNEX I - Revised

FINANCIAL BID PRESENTATION SHEET – REVISED December 11, 2015.

I.1 Evaluation of Price

The price of the bid will be evaluated in CANADIAN dollars, the Goods and Services Tax or Harmonized Sales Tax excluded.

a)	**KNOWN WORK** For work as stated in Annex A and detailed in the attached pricing data sheet Annex I, Appendix 1 LINE 28 a FIRM PRICE OF:	$
B)	**UNSCHEDULED WORK**: Estimated labour hours at a firm Charge-out rate, including overhead and profit: **3000** person hours X $_____per hour for a Price. Hours in excess of 3000 will be charged at this rate. Bidders are to include any premiums/surcharges or fees that are applicable to the hourly rate.	$
c)	**DAILY SERVICE FEES** (as per Article I4) Five (5) working days on drydock x $_____ = $_____ Two (2) non-working days on drydock x $_____ = $_____ Three (3) working days at berth x $_____ = $_____ Two (2) non-working days at berth x $_____ =$_____	$
d)	**VESSEL TRANSFER COSTS** (As per Article I5)	$
e)	**EVALUATED TOTAL** HST/GST Excluded (a+b+c+d)	$

I.2 Unscheduled Work

Unscheduled work arising, as authorized by the Minister, will be calculated in the following manner:

"Number of hours (to be negotiated) X your firm hourly Charge-out Labour Rate which includes Overhead and profit, plus net laid-down cost of materials to which will be added a 10% mark-up, plus Goods and Services Tax or Harmonized Sales Tax as applicable, of the total cost of material and labour. The firm hourly Charge-out Labour Rate and the material mark-up will remain firm for the duration of the Contract and any subsequent amendments."

I.2.1 Notwithstanding definitions or usage elsewhere in this document, or in the Bidders Cost Management System, when negotiating Hours for unscheduled work, PWGSC will consider only those hours of labour directly involved in the production of the subject work package.

Elements of Related Labour Costs identified in I.2.2 will not be negotiated, but will be compensated for in accordance with I.2.2 It is therefore incumbent upon the Bidder to enter values in the above table which will result in fair compensation, regardless of the structure of their Cost Management System.

I.2.2 Allowance for Related Labour Costs such as: Management, Direct Supervision, Purchasing and Material Handling, Quality Assurance and Reporting, First Aid, Gas Free Inspecting and Reporting, and Estimating will be included as Overhead for the purposes of determining the Charge-out Labour Rate entered in Table I.1 above.

I.2.3 The 10% mark-up rate for materials will also apply to subcontracted costs. The mark-up rate includes any allowance for material and subcontract management not allowed for in the Chargeout Labour Rate. A separate labour component for the purchase and handling of materials or subcontract administration is not allowable.

I.3 Overtime Fees

Compensation for authorized overtime will be calculated in the following manner:

a. For Known Work, the contract price plus agreed overtime hours paid at the following premium rates; or,

b. For Unscheduled Work, agreed overtime hours at the quoted *Charge-out Labour Rate* plus the following premium rates:

For Time and one half: $ _____ per hour; or,

For Double time $ _____ per hour

I.4 Daily Services Fees

Daily services fees are to be provided by the Bidder and entered in the table at I.1. In the event of a delay in the performance of the Work, and if such delay is recognized and agreed upon by the Contracting Authority as being attributable to Canada. These fees will be the sole liability of Canada to the Contractor for the delay.

The fees will include administrative support, production services, quality assurance, material support, and all other resources, direct costs, overhead and consumables needed to maintain the Vessel at the Contractor's facility. Daily fees for additional days on dock shall be inclusive of

layday charges. These fees are firm and not subject to any additional charges for mark-up or profit.

Ship services as indicated within services (specification item HD-02) will be paid based on unit cost as bid. The daily service fee bid in Annex I will apply to all additional days.

The number of days included in I1 are estimates for evaluation purposes only, but the rates will apply to all additional days

I.5 Vessel Transfer Costs

1. The evaluation price must include the cost for transferring the vessel from its home port to the shipyard/ship repair facility where the Work will be performed and the cost of transferring the vessel to its home port following completion of the Work, in accordance with the following:

(a) The Bidder must provide the location of the shipyard/ship repair facility where it proposes to perform the Work together with the applicable vessel transfer cost from the list provided under paragraph 2 of this clause:

Proposed shipyard/ship repair facility: _____

Applicable vessel transfer cost: _____.

(b) If the list in paragraph 2 of this clause does not provide the shipyard/ship repair location where the Bidder intends to perform the Work, then the Bidder must advise the Contracting Authority, in writing, at least __5___ calendar days before the bid closing date, of its proposed location for performing the Work.

The Contracting Authority will confirm to the Bidder, in writing, at least ___5 __ calendar days before the bid closing date, the location of the shipyard/ship repair and the applicable vessel transfer cost.

A bid that specifies a location for executing the Work which is not on the list of paragraph 2 of this clause, and for which a notification in writing has not been received by the Contracting Authority as required above, will be considered non-responsive.

2. List of shipyard/ship repair facilities and applicable vessel transfer costs

Vessel: _____

Home port: _____

Transfer costs in the case of vessels transferred using a government delivery crew include the fuel cost at the vessel's most economical speed of transit and for unmanned refits only, crew transportation costs for the delivery crew based on the location of the vessel's home port and the shipyard/ship repair facility. Crew transportation costs do not include any members of the delivery crew who remain at the shipyard/ship repair facility in order to discharge project responsibilities related to the vessel being transferred.

Transfer costs in the case of vessels transferred unmanned by either commercial towing, railway, highway or other suitable means of transportation must be: (i) included as part of the Bidder's financial bid in the case where the Bidder is responsible for the transfer; or (ii) identified as the applicable vessel transfer cost, as given in the list below, in the case when Canada is responsible for the transfer.

Vessel transfer Costs: These figures have been verified to be correct.

COMPANY	LOCATION	COSTS
AF Theriault	Methegan, NS	$ 6,669.00
Shelburne Ship Repair	Shelburne, NS	$ 4,008.00
LIFE	Lunenburg, NS	$ 1,659.00
Abco	Lunenburg, NS	$ 1,659.00
CME Marine	Sambro, NS	$ 587.00
Aecon Fabco	Pictou, NS	$ 7,809.00
Samson Enterprises	Arichat, NS	$ 4,734.00
NewDock	St. John's NFLD	$18,935.00
Verreault	Les Machine, QC	$18,762.00
CME Marine	North Sydney, NS	$ 7,913.00

APPENDIX 1 TO ANNEX H - PRICING DATA SHEETS

Spec Item	Title	Line Item	Price
01	General	1	
02	Services 2.1.6. Electric Power Unit / kWh for adjustment $_____ 2.1.7. Staging & Cranage per hour rate $_____ Lift rate: $ _____ 2.1.8. Potable Water Unit / cu.mtr for adjustment $_____ 2.1.9. Garbage Removal per diem rate for adjustment $_____ Removal costs: (per volume/quantity): - Newsprint/bond paper $_____ - Corrugated cardboard $_____ - Beverage containers $_____ 2.1.11. Protection, supply & Install per m2 $_____ 2.1.13. Fluid Removal Unit per each add'l 2500 ltrs $_____ 2.1.15. Overboard Discharge per cu.mtr. $_____	2	$
03	Production Chart & Subcontractor Allowances	3	$
HD-01	Docking & Undocking 2.1.7. Unit Daily Service Day on dock $_____	4	$
HD-02	Butts & Seams 2.1.4. Cost per prep and welding $_____ linear foot 2.1.5. Cost per gauging and welding $_____ linear foot 4.2.1 Cost per each add'l xray $_____	5	$
HD-03	Underwater Painting 2.1.4. $10,000.00 Allowance for FSR to be adjusted 2.1.11. Unit price for blasting to bare metal and painting $___ 2.1.12. Unit price for sweep blasting and Painting $_____ 3.3.3.1 $15,000.00 Allowance for staging supply/install/remove	6	$ $10,000.00 $15,000.00
HD-04	Hull Anodes 2.1.1 Unit Price to renew one(1) anode $_____	7	$
HD-05	Ballast Tanks 2.1.7 Unit cost for preparing and painting one sq meter of tank $_____ 2.1.8 Unit cost for supply and install one anode $_____ 2.1.10. Unit cost per stud $_____ to replace any broken manhole securing studs 4.2.3 Cost for hydrostatic testing $_____ 4.2.3 Cost for pneumatic testing $_____	8	$
HD-06	Rudder Gland Packing	9	$
HD-07	Fuel Tanks Survey 2.1.1 Rate per cubic meter of disposal $_____ 2.1.2 Unit cost per stud $_____ 2.1.11Unit cost per air test on each tank $_____ 2.1.13 Unit cost hydrostatic testing per tank $_____ 2.1.13 Cost per pneumatic test on each tank $_____	10	$

HD-08	Ultrasonic Thickness Measurements 2.1.5Cost per hour for use of person lift & operator $_____ 2.1.6 Cost per hour for one (1) certified technician $_____	11	$
HD-09	Stbd. Fresh Water Tank Repairs 2.1.3 Cost per 100 litres of waste fluid removal $_____ 2.1.12 Cost per sq meter to re-coat tank $_____ 2.1.25Allowance services of accredited Potable Water Sampling Company 4.1.4 Allowance for NACE Inspector 4.2.2Unit price for hydrostatic testing each tank $_____	12	$ $1,500.00 $5,000.00
HD-10	Frames Renewal	13	$
HD-11	Cathodic System 2.1.10 Allowance for CATELCO FSR $5,000.00	14	$ $5,000.00
HD-12	ADCP Removal	15	$
HD-13	Drains Tanks 2.1.6 Unit cost for prep/paint 1 sq. meter of tank area $_____ 4.1.3 Pneumatic testing $_____ 4.1.3 Hydrostatic testing $_____	16	$
HD-14	Stern Ramp Repairs 2.1.1 Cost per square foot of renewing plating $_____ 2.1.10Hourly rate for person lift and operator $_____	17	$
H-01	Berthing 2.1.3 Tug costs $_____ per hour 2.1.3 Pilot Costs $_____ per hour	18	$
H-02	Emergency Boat Davit Inspection 2.1.5 Allowance SCHAT FSR $10,000.00 2.1.16 Rate per shot $_____	19	$ $10,000.00
H-04	#1 Fuel Tank Vent Renewal	20	$
H-05	Cable Transit Repairs	21	$
E-01	Anchor Windlass Electrical Subcontractor _____	22	$
E-02	Anchors and Chains 2.1.10 Unit rate to repair slack studs $_____	23	$
E-03	Chain Locker	24	$
E-04	Ventilation Cleaning	25	$
E-05	Bitter End Modifications	26	$
E-06	#1 Fire & General Service Pump Survey	27	$
	TOTAL TAXES NOT INCLUDED (ITEMS 1-27)this is the price all the known Work in Annex F	28	$

HD-08 – Ultrasonic Thickness Measurements Rev. 1

1: SCOPE:

The intent of this Specification item is to complete an Ultrasonic Thickness Measurement report on ship's traverse section including longitudinals and girders, and exposed deck areas to satisfy TCMSB Deficiency.

2: TECHNICAL DESCRIPTION:

2.1 General

1. Contractor shall arrange for services of a NDT technician certified for performing ultrasonic thickness testing by a National accreditation body.

2. This specification item shall be completed continuing the work completed by TEAM Industrial Services, Inc. on August 24-28, 2015. A copy of this report can be found in Appendix D – TEAM UTM Survey Aug. 2015.

3. Contractor shall complete a UTM survey of the ship's hull, exposed decks, framing, and bulkheads in areas where TEAM Industrial failed to collect readings. These areas are notably:

    a) Engine Room Bulkhead No. 49
    b) Port and Starboard Fresh Water Tank Bulkheads and Framing
    c) Cofferdam Starboard side
    d) Shaft Tunnel frames 16-30

    NOTE: Shaft tunnel framing is filled with approx. 45 tons of steel punches covered by 6" of concrete. There is also a small layer of concrete below steel punches. Any items removed/disturbed shall be placed in original position. Any disturbed concrete shall be removed from ship and disposed of; new concrete shall be poured as originally fitted.

4. Hull plate thickness shall be determined in 400 positions as directed by CGTA and TCMSB Surveyor.

5. Locations and results of all thickness measurements shall be recorded and made available to CGTA within one week of taking readings.

6. Contractor shall provide the necessary personal to remove interference items as needed and ensure access for compressive readings to be obtained to the satisfaction of CGTA and TCMSB.

7. Areas which are not listed or contained in the TEAM report may require additional testing based on the requirements of TCMSB and CGTA.

8. Contractor shall quote, separately, unit cost for adjustment for services of NDT technician, man lift and operator for PWGSC 1379 adjustment purposes up or down.

2.2 Location

1. Testing is required in various locations throughout the ship; most notably the Ship's outer Hull, Engine Room, and Shaft Tunnel.

2.3 Interferences

1. Contractor is responsible for the identification of any interference items, their temporary removal and storage and refitting to the vessel.
2. Contractor is responsible for protecting surrounding area and equipment while carrying out this work

3: REFERENCES:

3.1 Guidance Drawings/Nameplate Data

1. Drawing: 182-01 Ballast Plan

3.2 Standards and Regulations

1. This item may require "Safe for Entry" and "Safe for Hot Work" permits to complete the wind and water survey and possible repairs. Contractor shall provide a unit cost for both permits. Ship's crew shall transfer fuel if necessary.

3.3 Owner Furnished Equipment

N/A

4: PROOF OF PERFORMANCE:

4.1 Inspection

1. Areas where testing is completed may be inspected by TCMSB and CGTA.

4.2 Testing

1. Ultrasonic Thickness Measurement devices are to be properly calibrated with certificates.

4.3 Certification

1. Contractor shall provide a copy of UTM report to TCMSB for certification of ship's underwater hull & structure.

5: DELIVERABLES:

5.1 Reports, Drawings, and Manuals

1. Two (2) copies of the UTM report shall be given to the CGTA along with two digital copies supplied on two separate USB sticks.
2. One (1) copy of the UTM report shall be given to TCMSB.

5.2 Spares

N/A

5.3Training

N/A

HD-09 – Stbd. Fresh Water Tank Repairs

1: SCOPE:

The intent of this specification item is to renew corroded and damaged steel plating on the starboard fresh water tank and have it signed off by TCMSB for its five year survey credit.

2: TECHNICAL DESCRIPTION:

2.1 General

1. Contractor shall complete this task in conjunction with Specification item **HD-10 Frames Renewal.**

2. Contractor shall close, isolate and lock out the tank suction & fill valves.

3. Contractor shall remove any water remaining in tank following discharge of the contents. The amount is estimated to be approx. 2 cubic meters. Contractor shall quote a cost per 100 liters of waste fluid removal for adjustment purposes by PWGSC 1379 action.

4. Contractor shall remove tank manhole cover.

5. Tank shall be certified safe for personnel to enter prior to any work being carried out internally. Contractor shall arrange for a certified Marine Chemist to visit the ship, test the tank, and certify that tank is "Safe for Entry" for personnel to enter and "Safe for Hot Work". Copies of certificates shall be given to CGTA and posted outside manhole cover in a conspicuous location and one copy to be provided to CGTA. Tank shall be constantly ventilated & tested daily.

6. Contractor shall note the tank is fitted with PSM tank level and overflow sensors and shall suitably protect transducers when carrying out this work. Proper functioning of these sensors shall be proven before and after completion of work.

7. Contractor shall protect tank surfaces that do not need steel work from excessive welding/grinding/cutting debris & contamination.

8. Contractor shall carry out steel repair work as described in Lengkeek Vessel Engineering Specification for Structural Repair of Corrosion Damage (Appendix B).

9. Contractor shall bid on price to prepare and re-coat 120 m^2 of internal tank surface. In addition, contractor shall provide a Unit Cost per square meter to re-coat tank surfaces. This unit cost shall be used for adjustment purposes via PWGSC 1379 action, based on the agreed area to be coated between CGTA and Contractor. This area shall be determined prior to mechanical cleaning defined in paragraph 2.1.10.

10. All tank internal and external areas of coating loss, breakdown, or blistering, as identified by CGTA and Contractor, shall be scaled and mechanically cleaned to SSPC-SP3 standard. All prepared areas shall extend and feather out to sound, intact coating, tightly adhered to steelwork. Intact coating around perimeter edges of prepared areas shall be generously feathered. Tank then shall be thoroughly cleaned and wiped down to remove any and all grit, dirt, debris, and any other solid or liquid contamination that may be present, prior to coating

application. CGTA shall perform an additional inspection of tank prior to application of repair coatings. Contractor shall be responsible for disposing of all removed paintwork, scale, dirt, etc. in an environmentally safe manner.

11. Contractor shall apply Royal Coatings "Easy Prep" (see Appendix "A" for product data sheet) by airless sprayer to all internal surfaces of the tanks and let stand 20 to 30 minutes. Apply 8,000-10,000 psi water blasting to all internal surfaces then remove wash down liquid and debris and ventilate tank until dry.

12. Upon completion of water jet blasting, all residue and debris shall be cleaned and removed from the tanks. Contractor shall ensure that all sounding and suction pipes are free and clear as well as all limber holes in the floors, stringers and webs so as to allow for proper drainage. Upon completion of all cleaning, CGTA shall thoroughly inspect tank internals.

    Suggested supplier: Royal Coatings - EasyPrep, EasyPrime and EasyFlex is:
    Barry Schnare – Manager, Marine and Industrial Coatings
    K&D Pratt
    55 Akerley Blvd,
    Dartmouth, NS
    B3B 1M3
    DL: (902) 480-3011 C: (902) 456-9238
    Barry.schnare@kdpratt.com www.kdpratt.com

13. Before application, coatings (EasyPrime and EasyFlex) must be above 22º C prior to mixing. See Appendix "A" for EasyPrime and EasyFlex product data sheets.

14. Contractor shall note that application conditions must provide a substrate temperature greater than 3ºC and rising while air temperature must be greater than 4ºC. Relative humidity shall be lower than 90% during application. Contractor shall be responsible to supply and maintain heating/dehumidifying equipment required to ensure proper environment

15. All new plate and disturbed areas shall be coated with one coat to 3-4mils of Royal's EasyPrime to all prepared steel. Any sharp edges within the prepared areas shall be stripe coated with EasyFlex. Apply one top coat of EasyFlex to all primed areas to a wet film thickness of 12-14mils. Runs and sags in the applied coating should be left alone. Allow the coating to cure for 48hours @ 20ºC or above. At lower temperatures let cure for 72 hours. When coating is thoroughly cured, tank shall be inspected by CGTA and local accredited health inspector. Coating adhesion and condition must be acceptable to CGTA and local accredited health inspector. Contractor shall obtain verbal approval from CGTA prior to closing this sensitive tank.

16. Manhole cover inside shall be given the same cleaning, prep and paint treatment as tank internals.

17. Paint scheme on Exterior of Stbd Potable Water tank and manhole shall be two contrasting coats of International INTERSHIELD ENA 300V epoxy coatings.

18. Upon completion of above work and to satisfaction of CGTA and accredited health inspection representative, tank shall be wiped clean with lint-free rags. Sounding pipes, suction pipes and vents shall be proven clear prior to filling the tank with potable water. All debris shall be removed ashore tank closed up in good order. CGTA shall examine each tank prior to final closing. Manhole covers shall be installed using new gaskets/O-ring as fitted. Anti- seize compound (marine grade) shall be applied to the fasteners of the manhole covers. No use of power tools shall be permitted to tighten the fasteners.

19. Upon completion of all work tank shall be filled with certified potable water. Vent shall be removed and each tank shall be filled to overflowing for a hydrostatic test on tank to the satisfaction of CGTA. Vent shall be installed with new gaskets and SS fasteners upon completion of all work.

20. Tank shall be filled with certified potable water and calculated amount of Sodium hypochlorite 5% solution to attain 50mg/L of free chlorine for the purpose of superchlorination of the tank. Contractor shall supply enough 5%~sodium hypochlorite solution to provide a mixing ratio of 1liter solution/ 1 m3 water within tank. Tank shall rest in this condition for a period of 24hrs. The solution shall be circulated by ship's personnel as required.

21. Super-chlorinated water shall then be run through various potable water piping systems onboard the vessel for at least one hour. Testing shall be carried out to ensure that the super-chlorinated solution is flowing through each tap. Contractor shall test various locations to prove this.

22. Upon completion of super-chlorination process, tank solutions shall be neutralised using 35% hydrogen peroxide. Contents of tank water shall be tested to determine that chlorine has been neutralised. Once this has been achieved, Contractor shall dispose of the water in accordance with the Provincial Regulations. Contractor shall submit a report to CGTA showing the results of the various tests during the super-chlorination /de-chlorination process.

23. Tank shall receive another complete fill and flush operation with certified potable water. All water used in the flushing process shall be disposed of by Contractor.

24. Contractor shall fill the tank with certified potable water. Contractor shall dose and test tank contents until a free chlorine maintenance level of 0.2-0.5 mg/l of free chlorine has been attained.

25. Tank shall have a water sample taken once step 28 is completed AND after it has rested in the tank for a period of three (3) days. Contractor shall include an allowance of $1,500.00 to retain the services of an accredited Potable water sampling company. Samples shall be collected in approved containers by a representative of accredited company and then tested at their laboratory facility. The water shall be certified acceptable as a potable source. CGTA shall receive the report and final analysis of potable water samples for posting onboard of the vessel.

26. Contractor shall arrange and co-ordinate the visits required for Provincial Health Inspector or accredited testing authority.

2.2 Location

Engine room, frames 38-48, Capacity 20.82m^3, Surface Area 117m^2

2.3 Interferences

1. Contractor is responsible for the identification of any interference items, their temporary removal and storage and refitting to the vessel.
2. Contractor is responsible for protecting surrounding area and equipment while carrying out this work.
3. HD-10 Frame Renewal Specification Item

3: REFERENCES:

3.1 Guidance Drawings/Nameplate Data

1. Appendix B - Lengkeek Vessel Engineering Frame Renewal Spec *J15057-R01, rev0*
2. Drawing # 120/004 Tank Capacity Plan
3. Drawing # 532/02 List of Manholes
4. Drawing # 703/04 Manhole Cover

3.2 Standards and Regulations

1. Contractor is required to abide by the Fleet Safety and Security Manual provisions for Hot Work, Confined Safe Entry and Fall Protection and/or follow an equivalent safety management system. Task Hazard assessments will be performed prior to work commencing each working day.
2. Any necessary welding shall be performed to CWB 47.1 and visually inspected by a qualified welding supervisor.
3. Any item of work involving the use of heat in its execution requires that Contractor shall advise Chief Engineer before starting such heating and upon its completion.
    a. Contractor shall provide suitable fire retardant coverings to protect wire ways, cables, equipment and structure from welding slag, splatter etc. in all surrounding areas.
    b. Contractor shall provide sufficient suitable fire extinguishers and a fire watch during any such heating and until the work has cooled.
    c. The Ship's extinguishers shall **not** be used except in an emergency.
    d. Contractor shall service and shall refill any ship's extinguisher used under such conditions

3.3 Owner Furnished Equipment

N/A

4: PROOF OF PERFORMANCE:

4.1 Inspection

1. Contractor shall allow adequate time and availability for inspection whenever required by this specification.
2. Contractor shall follow the manufacturer's paint application processes.
3. Contractor shall obtain the services of an independent certified NACE International (NACE) inspector with a minimum certification of Coating Inspector Program Level 2, to verify the work as specified throughout the process and can provide assurance to the CCG Technical Authority

that the Contractor has followed the correct application procedures. Copy of the NACE inspector qualifications shall be given to the CGTA and PWGSC.

4. In the overall quote, Contractor shall allow $5,000 for services of a certified NACE inspector Field Service Representative. This FSR allowance shall cover travel and living expenses only. The FSR shall be reimbursed for the authorized travel and living expenses reasonably and properly incurred in the performance of the work at cost without any allowance for overhead or profit. The final cost shall be adjusted accordingly by PWGSC 1379 action upon receipt of invoice. Contractor shall make all necessary arrangements for the procurement of the FSR's services.
5. Contractor shall ensure that all new equipment be used for the application of the coating, including but not limited to: hoses, spray guns, brushes, etc. This requirement is important to ensure zero contamination from solvents, which may be introduced inadvertently by used equipment that has subsequently been cleaned with solvents of any kind.
6. Contractor shall be responsible for coordination of all inspections with TCMS Surveyor, and produce an inspection schedule prior to commencement of work.
7. Contractor shall provide the Owner's representative a minimum of four hours' notice of each inspection, to allow his/her attendance.
8. Upon completion of all repairs and testing, the Contractor and the Owner's representative (or designate) shall conduct a final inspection and ensure all tanks, covers, vents and piping connections have been returned to operating conditions and the attending TCMS Surveyor has completed all inspections.

4.2 Testing

<u>WATER QUALITY TESTING:</u>

1. After the final fill of the tanks, three (3) water samples shall be collected and labelled for laboratory testing. The collection of the potable water samples (one from tank, one from galley tap, one from chief scientist cabin tap) for laboratory testing shall be witnessed by CGTA. To maintain the bacteriological validity of the collected samples, they shall be immediately transported to the qualified laboratory facility in thermally insulated outer containers.
2. Contractor shall ensure that the water testing has a baseline of 28 parameters for the water quality test, and shall be performed as per section 7.A.12 of the Fleet Safety Manual. After the super chlorination procedures, and in addition to the Fleet Safety Manual, another 28 parameter test shall be performed three days after the baseline test with the water in the tank remaining stagnant.
3. All costs associated with all the water sampling, containers, testing, shipping, and reporting fees shall be Contractor's responsibility. The cost shall be included in the overall bid.
4. A total of six (6) water tests (28 parameter) shall be completed throughout the scope of this work.

<u>TANK TESTING FOR SURVEY PURPOSES:</u>

1. The attending TCMSB Inspector shall determine the test method. All tests shall be witnessed by the attending TCMSB Inspector and the CGTA.
2. For bidding purposes, Contractor shall bid on the pneumatic testing of each individual tank, and provide a unit price for hydrostatic testing each tank. The quote shall include the installation and removal of blanks for suctions, overflow pipes, removal and blanking vent heads, and blanking additional tank openings. Tank drainage (including the disposal of water and the wiping down of the tank internals) shall also be included in this quote.

<u>SENSOR TESTING:</u>

1. Tank level sensor accuracy shall be verified by CGTA while filling the tank at end of repairs.

4.3 Certification

1. WATER: Contractor shall expeditiously provide to the Owner test certificates of water samples (chemistry and bacteriological) from a Provincially H&W approved laboratory that certifies that the water in the tanks is "fit to drink". The tests shall be carried out for bacteria as per the Canadian Drinking Water Guidelines. The Chemistry Testing shall examine all parameters as per the Guidelines for Canadian Drinking Water Quality including pH, TDS, Elements and Organic Compounds
2. TANK: Contractor is responsible to ensure the TCMS Surveyor signs off all surveyed tanks in the vessel's Hull and Machinery Survey Record Book and Division 3 report under the field numbers specified above

5: DELIVERABLES:

5.1 Reports, Drawings, and Manuals

1. Contractor shall supply the product data sheets and MSDS sheets on all products used in the course of this work (cleaning, coating, sterilizing and neutralizing).
2. Contractor shall provide 2 copies of all test certificates to CGTA.
3. A paint report shall be prepared, and provided to VMM and CGTA.
4. Safety Management System forms and checklists shall be provided to CGTA.
5. All water test reports shall be provided to VMM and CGTA.
6. Contractor shall provide 2 reports to CGTA of all steel work completed.

5.2 Spares

N/A

5.3Training

N/A

SECTION 2 (WINDLASS)

INDEX

SECTION 2.0

LIST OF DRAWINGS

DRAWING NO.	DESCRIPTION
50794-A1 Rev. No. 0	Brake Arrangement
50809-A1 Rev. No. 1	Gearbox General Arrangement
51593-A1 Rev. No. 0	Clutch Arrangement
51594-A1 Rev. No. 2 Shts. 1 & 2	Anchor & Warping Windlass General Arrangement

SECTION 2.1

WINDLASS RATING

Size of chain	28MM (1 1/8) U3
No. of wildcats	Two (2)
Rated pulls & speeds from wildcat	4.77 MT @ 16 F.P.M. 5.30 MT @ 32 F.P.M. 2.65 MT @ 64 F.P.M.
Wildcat stall pull	8 MT
Wildcat brake holding cap	15 MT
No. of warping drums	Two (2)
Diameter of warping drum	12"
Rated pulls & speeds from warping drum	5.00 MT @ 15 F.P.M. 5.79 MT @ 30 F.P.M. 2.89 MT @ 60 F.P.M.

SECTION 2.2

DESCRIPTION

2.2.1 The windlass is a double wildcat horizontal type electrically driven. Two warping drums are fitted one on each end of the main spindle.

2.2.2 The windlass is driven by a totally enclosed, triple reduction, oil bath lubricated gearbox. All gearing is to A.G.M.A. standards. All shafts rotate on anti-friction roller bearings except the output shaft which is carried on suitable bronze bushes. The gearbox is of welded steel construction and is provided with a dipstick oil, drain plug and inspection cover and is split at the main spindle for ease of maintenance.

2.2.3 Fabricated outer supports fitted with bronze bushes are positioned between the wildcats and warping drums nd are split at the centre for ease of maintenance.

2.2.4 Two five whelp cast steel wildcats with integral brake paths are fitted one on either side of the gearbox. Each wildcat can be independently clutched to the gearbox output shaft.

2.2.5 A dog clutch is fitted to each wildcat. The clutch is lever operated and a pin is provided for locking the lever in either the "IN" or "OUT" position.

2.2.6 Each wildcat is fitted with a manual screw operated brake band designed to hold the specified load.

2.2.7 A 12" diameter cast MEEHANITE warping drum is fitted on each end of the main spindle.

SECTION 2.3

INSTALLATION AND START-UP PROCEDURE

2.3.1 The windlass is to be installed on a suitable reinforced seating. The seating should be reasonably flat and level to ensure that all the mounting pads are in contact wiht it. Any discrepancy between mounting pads and seting is to be made up using shims.

2.3.2 Sixteen (16) 1" diameter bolts are used to secure the windlass in position. These bolts should be SAE Grade 5 minimum. Details of bolt layout together with shipyard supplied shear blocks are shown on Drawing No. 51594-A1 (Shts. 1 & 2).

2.3.3 Fill gearbox to the indicated level on the dipstick with the specified grade of oil. (See Section 4 of manual).

2.3.4 Grease lubricate all points on the windlass either with a gun or brush as necessary all as indicated in Section 2.5.2 using recommended grease in Section 4 of the manual.

SECTION 2.4

OPERATING INSTRUCTIONS

2.4.1 DROPPING OF ANCHOR

Ensure wildcat brake is applied. Disengage the clutch. Control of the anchor is now at the brake. To let go the anchor, slowly release the brake until the cabin runs free. To control the speed of drop gently apply the brake.

2.4.2 RAISING THE ANCHOR

Engage wildcat clutch and release brake. Start motor by moving control handle in "HEAVE" direction.

2.4.3 USE OF WARPING DRUM

To use warping drums apply both wildcat brakes and disengage both wildcat clutches. Start up motor.

SECTION 2.5

MAINTENANCE

2.5.1 General maintenance comprises mainly of periodic lubrication as follows:-

2.5.2 GREASE

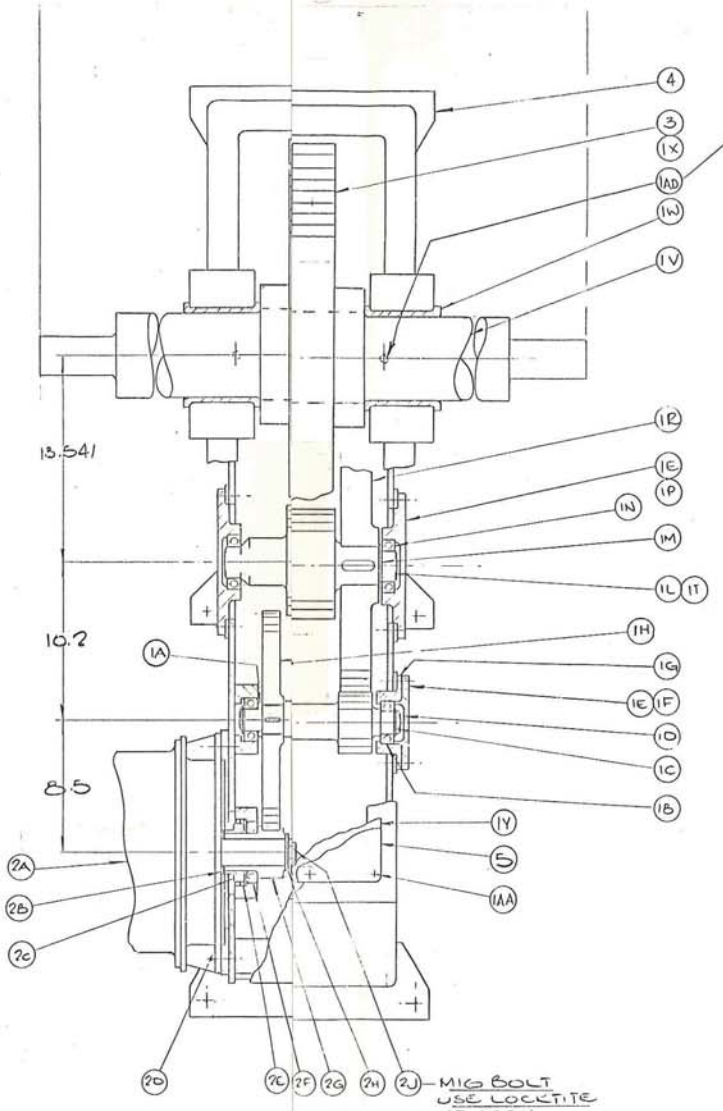
(A) Once weekly apply grease by gun to the following locations:-

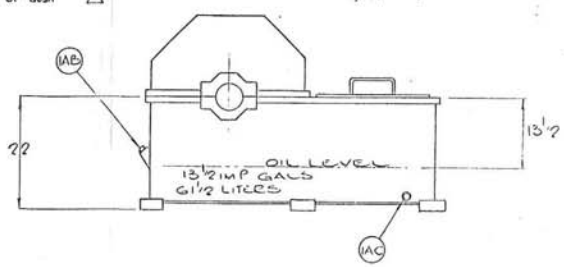
ITEM	DRAWING NO.	NO. OF POINTS
Brake	50794-A1	4 per brake
Clutches	51593-A1	4 per clutch
Clutch lever pins	51593-A1	2
Wildcat	51594-A1	2
Outer support	51594-A1	2
Gearbox main bearings	50809-A1	2

(B) Once weekly brush apply grease to following points:-

Threaded portion of brake screws
Exposed square sections of shaft on which clutches slide
Clutch grooves

2.5.3 Every month check gearbox oil level and replenish as required with specified grade of oil.





(1) GEARBOX GENERAL ASSY

(2) MOTOR ASSY

15 imp Gals
56.8 LITRES

E.S.T. WET. 1980 lbs

#50809-A1 Rev.1

DO NOT SCALE – IF IN DOUBT ASK
NE PAS MESURER – SI EN DOUTE DEMANDER

ALL DIMENSIONS IN INCHES
ALLOWABLE VARIATION ON CONTROLLING FINISHED SURFACES IS ± .010 UNLESS OTHERWISE SPECIFIED
TOLS. TO DIMENSIONS TO FOLLOW
CHANGEMENT ADMISSIBLE SUR SURFACE FINIS CONTROLÉES EST. .010 SAUF INDICATION CONTRAIRE

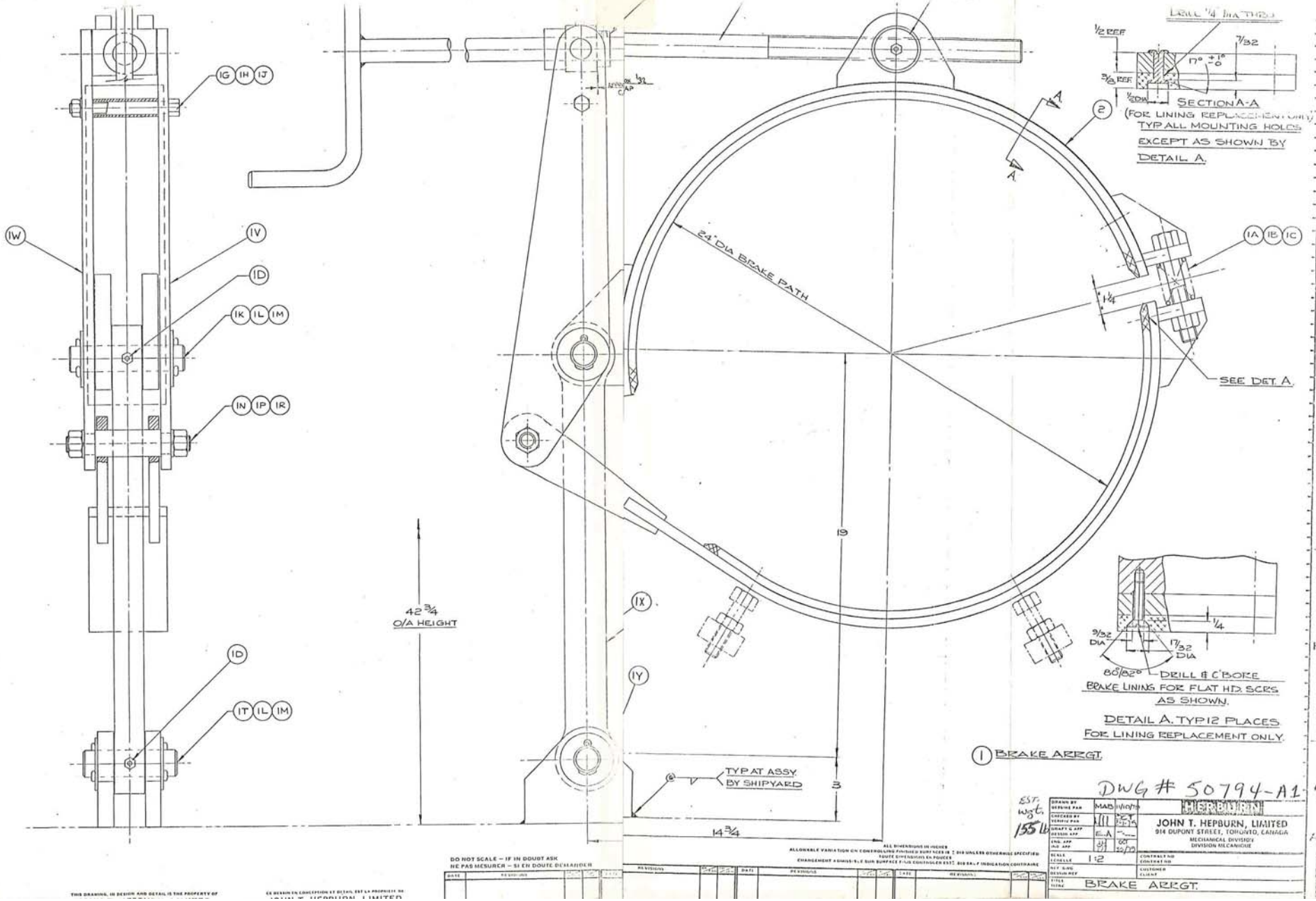
DATE	REVISIONS	BY	CHK
11/5/79	A ITEM 1AD & NOTE		

DRAWN BY / DESSINÉ PAR	PM	7/5	
CHECKED BY / VÉRIFIÉ PAR	PM	7/5	
DRAFT'G APP / DESSIN APP	E.A.	7/5	
ENG. APP / ING. APP	MM	7/5	
SCALE / ÉCHELLE	1:4		
REF. DWG / DESSIN REF			

JOHN T. HEPBURN LTD.
914 DUPONT STREET, TORONTO
MECHANICAL POWER TRANSMISSION DIVISION / MÉCANIQUE

CONTRACT NO. / CONTRAT NO.
CUSTOMER / CLIENT

TITLE / TITRE: GEARBOX GENERAL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(1D)
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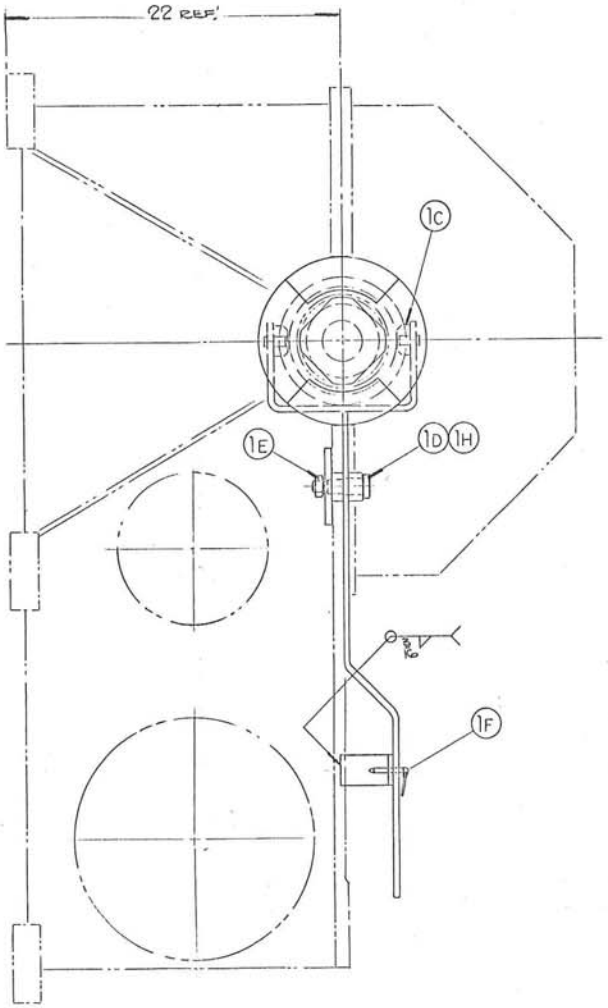
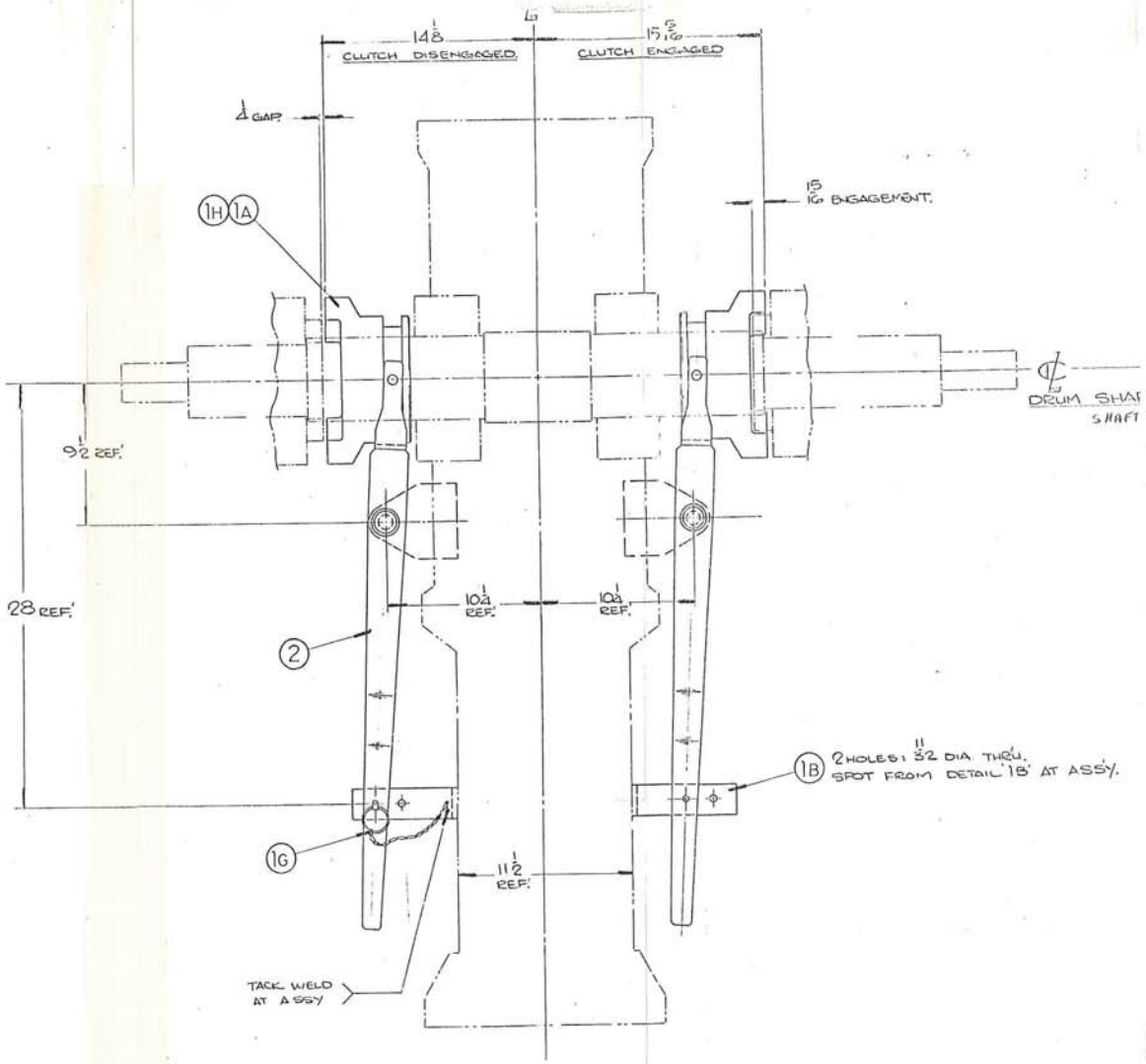
(1N) (1P) (1R)
(1D)
(1T) (1L) (1M)
42 3/4 O/A HEIGHT
24" DIA BRAKE PATH
19
3
14 3/4
(1X)
(1Y)
TYP AT ASSY BY SHIPYARD
(2)
A
A
LABEL 1/4 DIA THRU
1/2 REF
7/32
17° +1° -0
3/8 REF
1/2 DIA
SECTION A-A
(FOR LINING REPLACEMENT ONLY)
TYP ALL MOUNTING HOLES
EXCEPT AS SHOWN BY
DETAIL A.
(1A) (1B) (1C)
1 1/4
SEE DET A.
9/32 DIA
1/4
17/32 DIA
80/82°
DRILL & C'BORE
BRAKE LINING FOR FLAT HD. SCRS
AS SHOWN.
DETAIL A. TYP 12 PLACES
FOR LINING REPLACEMENT ONLY.
(1) BRAKE ARRGT.
DWG # 50794-A1
EST. WGT. 155 lb
DRAWN BY DESSINE PAR MAB
CHECKED BY VERIFIE PAR
DRAFT & APP DESSIN APP
ENG. APP ING. APP
SCALE ECHELLE 1:2
JOHN T. HEPBURN, LIMITED
914 DUPONT STREET, TORONTO, CANADA
MECHANICAL DIVISION
DIVISION MECANIQUE
BRAKE ARRGT.
DO NOT SCALE – IF IN DOUBT ASK
NE PAS MESURER – SI EN DOUTE DEMANDER
THIS DRAWING, ITS DESIGN AND DETAIL IS THE PROPERTY OF





① CLUTCH ARRGT.

Est wgt 347 lb.

DWG # 51593-A1

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CHECKED BY / VERIFIÉ PAR			
DRAFT'G APP			
DESIGN APP	EA		
ENG APP			
QUAL APP			
DESIGN REF			
SCALE / ÉCHELLE	1:4		

JOHN T. HEPBURN,
914 DUPONT STREET, TORO
MECHANICAL DIVISION / DIVISION MÉCANIQUE

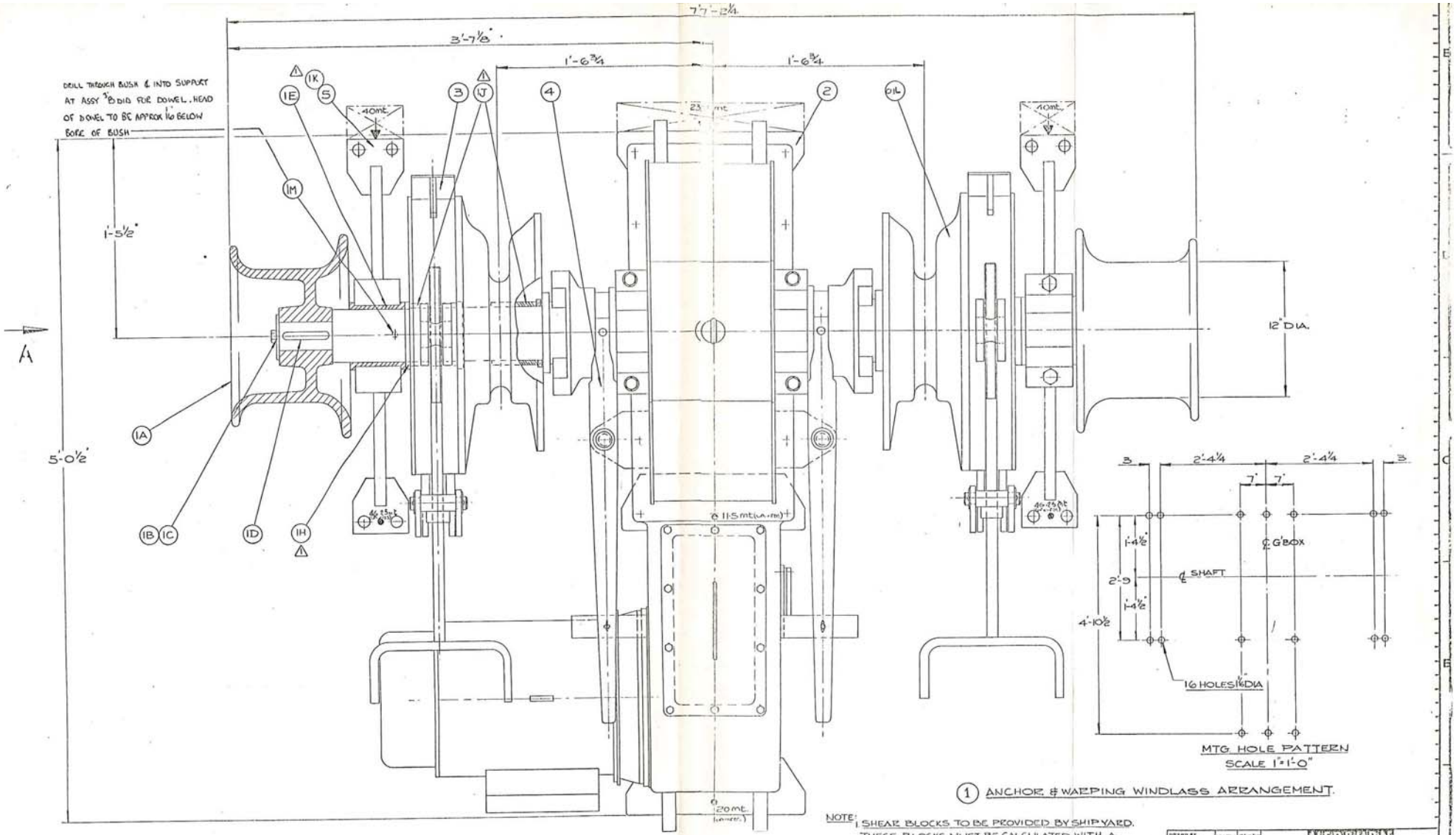
CONTRACT NO / CONTRAT NO
CUSTOMER / CLIENT

TITLE / TITRE: CLUTCH ARRGT
SHEET 1 OF 1
REV. 0

DO NOT SCALE – IF IN DOUBT ASK / NE PAS MESURER – SI EN DOUTE DEMANDER

ALL DIMENSIONS IN INCHES
ALLOWABLE VARIATION ON CONTROLLING FIGURES 0.2 FOR UNLESS OTHERWISE SPECIFIED
TOUTE DIMENSIONS EN POUCES
CHANGEMENT ADMISSIBLE SUR SURFACE FINIE CONTROLEE EST DE 0.2 SI INDICATION CONTRAIRE

DATE	REVISIONS



MTG. HOLE PATTERN
SCALE 1"=1'-0"

(1) ANCHOR & WARPING WINDLASS ARRANGEMENT.

NOTE:
1. SHEAR BLOCKS TO BE PROVIDED BY SHIPYARD. THESE BLOCKS MUST BE CALCULATED WITH A SECURITY COEFFICIENT OF 2.5 AGAINST RUPTURE.
2. ALL LOADS BASED ON CHAIN BREAK.
3. ALL HOLD DOWN BOLTS TO BE GRADE 5.

DO NOT SCALE – IF IN DOUBT ASK
NE PAS MESURER – SI EN DOUTE DEMANDER

DATE	REVISIONS	BY
	ITEMS 1E TO 1K ADDED	MAB
	ITEM 1M ADDED	MF

DRAWN BY / DESSINE PAR: MAB 74/07/02
CHECKED BY / VÉRIFIÉ PAR: MF 74-7-3
DRAFT'G APP / DESIGN APP: E.A.
ENG. APP. / ING. APP: MF 74/07/23
SCALE / ÉCHELLE: 1:4

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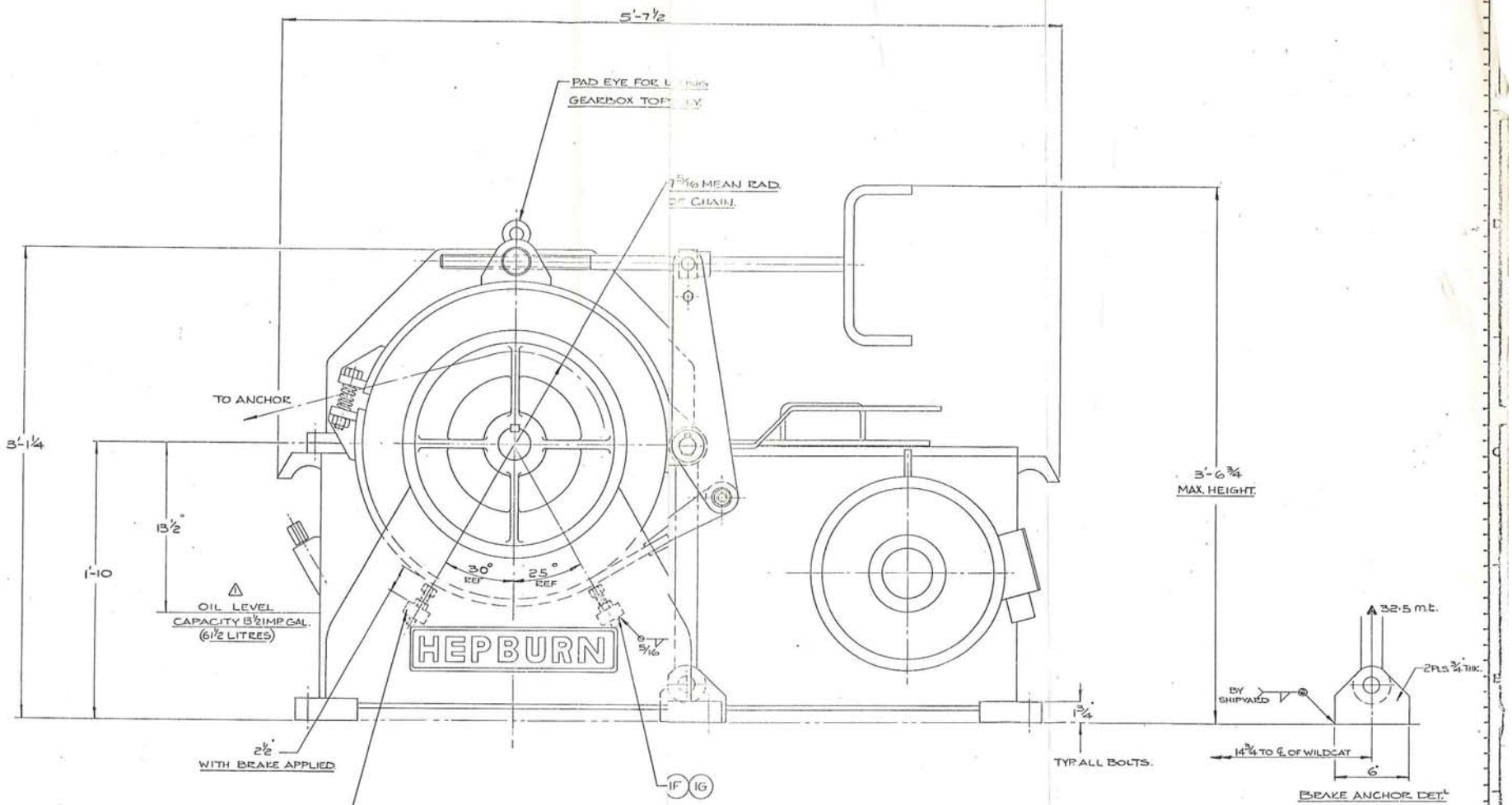
JOHN T. HEPBURN, LIMITED
914 DUPONT STREET, TORONTO, CANADA
MECHANICAL DIVISION
DIVISION MÉCANIQUE

CONTRACT NO / CONTRAT NO
CUSTOMER / CLIENT
TITLE / TITRE: ANCHOR & WARPING WINDLASS ARRGT.
DRAWING NO / DESSIN NO: 1 2
DWG. NO: #51594-A1
REV: 2

RST. WGT. 5995 lb.



wgt: see sheet 1

DO NOT SCALE — IF IN DOUBT ASK
NE PAS MESURER — SI EN DOUTE DEMANDER

ALL DIMENSIONS IN INCHES
ALLOWABLE VARIATION ON CONTROLLED FINISHED SURFACES ± 1/16 UNLESS OTHERWISE SPECIFIED
TOUTE DIMENSIONS EN POUCES
CHANGEMENT ADMISSIBLE SUR SURFACE FINIS CONTROLER EST ± 1/16 SAUF INDICATION CONTRAIRE

DATE	REVISIONS	BY
5/10	⚠1 13½ IMP GALLS 12 IMP GALLS 61½ LITRES WAS 54 LITRES ⚠2 See Sht. 1	MAB

DRAWN BY DESSINE PAR	MAB	25/10/78
CHECKED BY VERIFIE PAR	[illegible]	[illegible]
DRAFT'G APP DESIGN APP	E.A.	
ENG. APP ING APP	[illegible]	25/10/78
SCALE ECHELLE	1:4	
REF. DWG DE CON REF		
TITLE TITRE	ANCHOR & WARPING WINDLASS ARRGT.	
SHEET NO. FEUILLE NO.	2 of 2	
wgt.	See SHEET 1	

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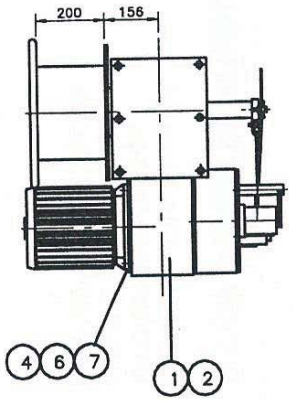
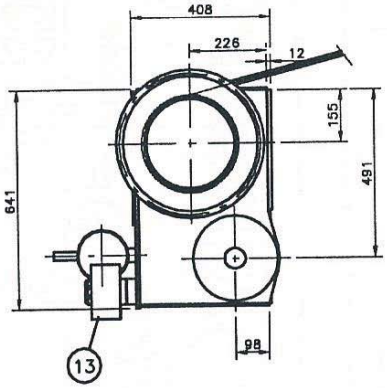
MECHANICAL DIVISION
DIVISION MECANIQUE

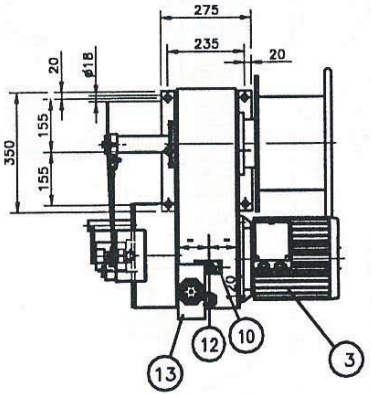
CONTRACT NO
CONTRAT NO
CUSTOMER
CLIENT

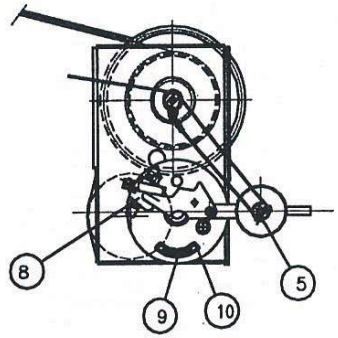
DWG. NO. 51594-A1 2

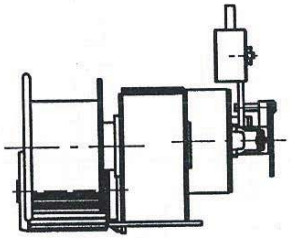
Righthanded Winch has been drawn.
Lefthanded Winch is opposite hand.
Carter to be filled with 6L. Oil
Oil is yard supply.











Item no.	Quantity	Description	Material	Art. no.	Remarks
13	1	Heater OE-311 3x460V 330W		incl. in pos. 1	
12	1	Instruction plate		N93346	
11	1	Hand crank		N73224	
10	8	Plate scr. count. head M4.8x13		0216.00109	DIN7983
9	1	Instruction plate H Instruksjon skilt H		N93333	
8	1	Limit switch arr. Endebryter arr.		N83074	
7	1	Motorpinion D-84 M-3 Z-28 Motor tannhjul		N93331	
6	4	Hex.head screw M12x25	8.8	0202,12209	
5	1	Remote control (Stop) H Fjernkontroll (Stop) H		N65279	
4	1	Seegerring A 28		0240.37559	
3	1	El.motor IEC 112 Shaft ø28 w/circlip		0464.10009	
2	1	Centrifugal brake 250 Sentrifugalbrems 250		N73197-02	To be calc.for each winch.
1	1	Winch assembly FM(E) 194 H Komplett vinsj FM(E) 194 H		NB1477	

Approved by
Check by
Date, sign.
Date: 11.01.01
Drawn: KCU
Name: JB
Approved: MRod
Projection
Scale: 1:10

schat-hardin

Mark

FME194 H STOP ARRANGEMENT WINCH "Alfred Needler"

Replacement for :
Replaced by :
NC0494

Art.
Reference: N73611
Calculation

MOB DAVIT
- PARTICULARS -

DAVIT AND WINCH DATA

Davit Type	M O B ..... 350 / 3.65 / 10E
Winch Type	F M E 194 ..... "STOP"
Safe Working Load on 3.65m Out-reach Davit Jib	10 ..... kN
Safe Working Load - Winch	12.81 ..... kN

ELECTRICAL DATA

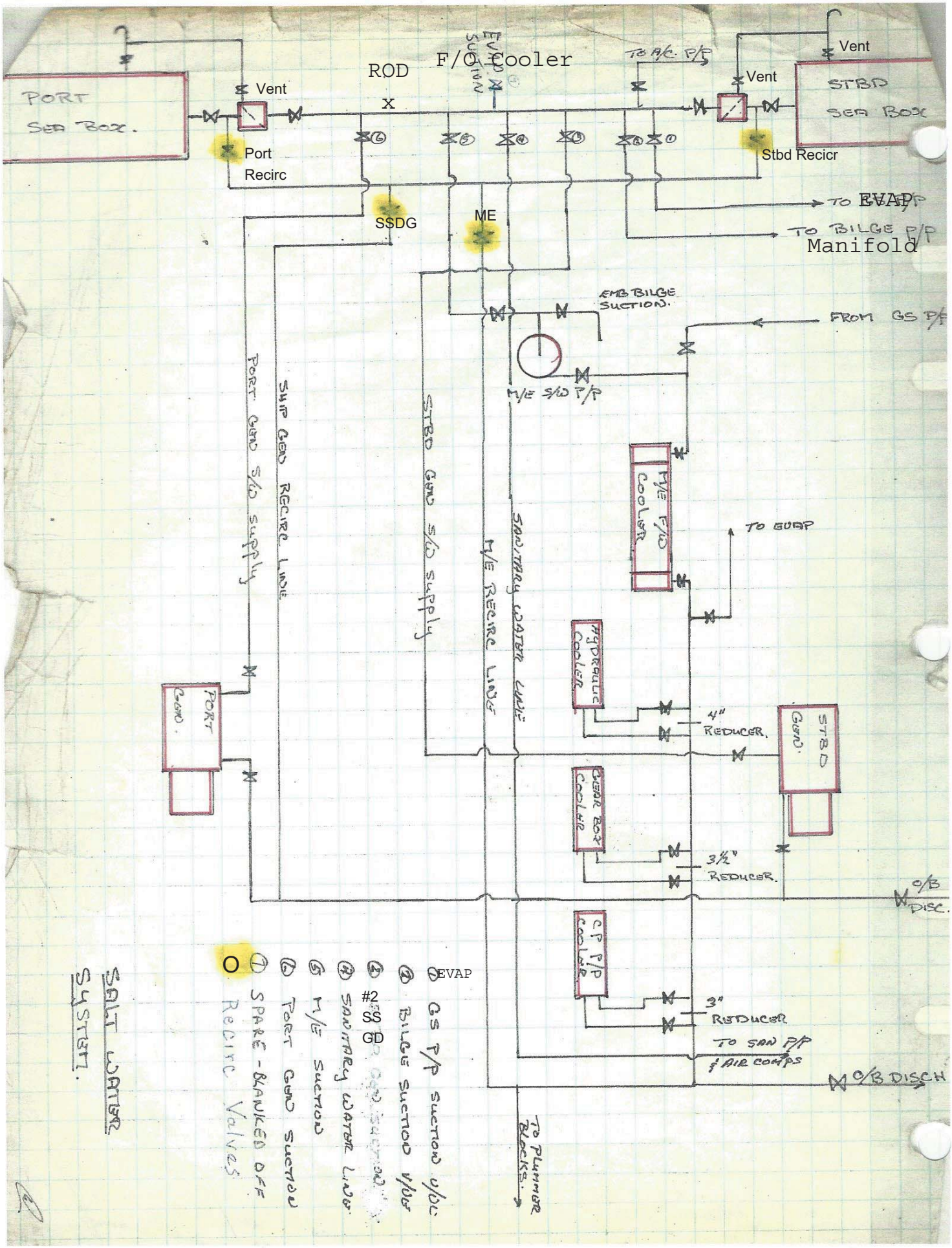
Motor Manufacturer / Type	Rotor 112M04
Rated Power	6.5 ..... kW
Duty Rating	S 2 - 10 ..... min
Power Circuit Voltage and Frequency	440 V ..... 60 Hz

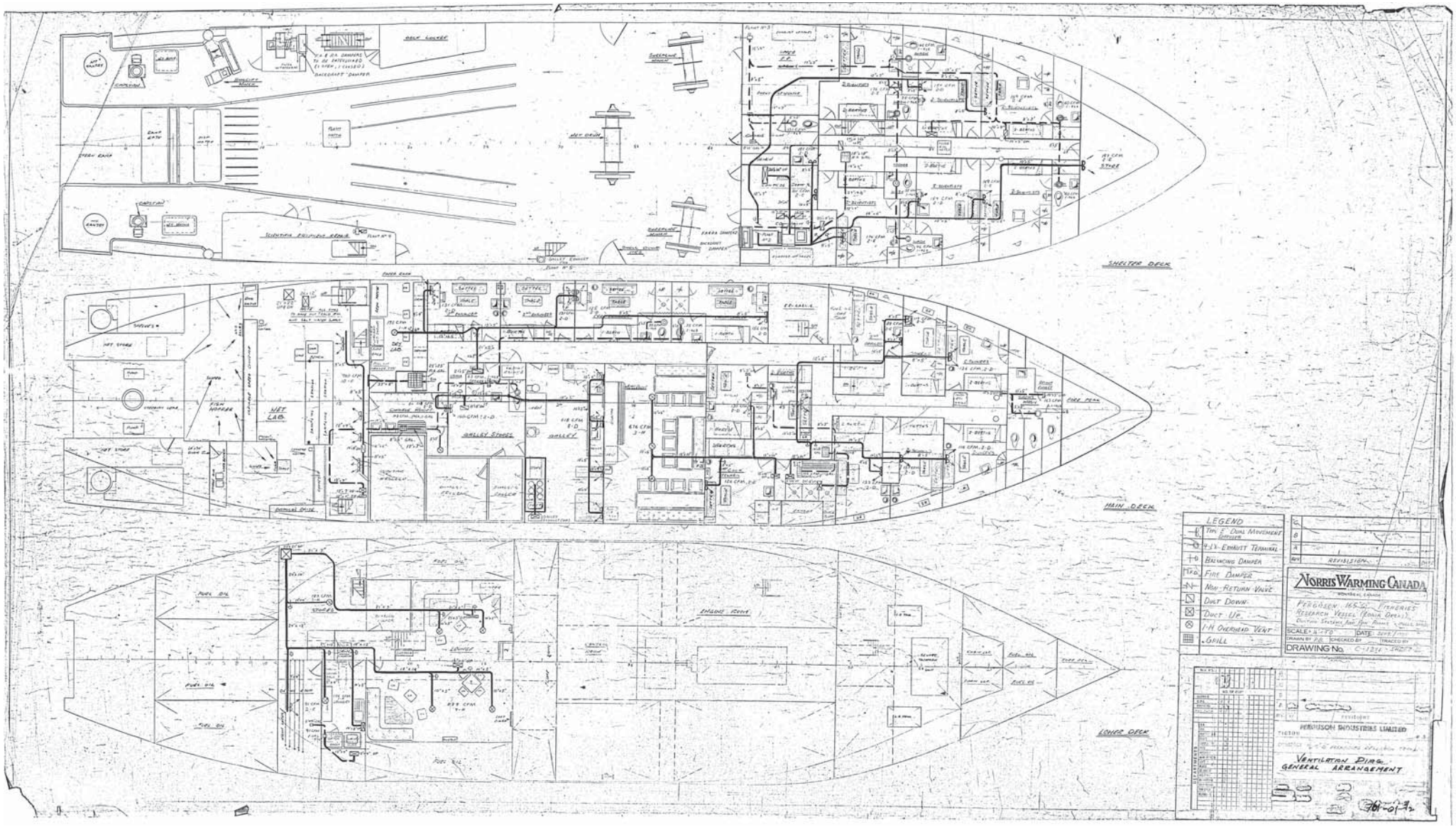
WIRE ROPE FALL DATA

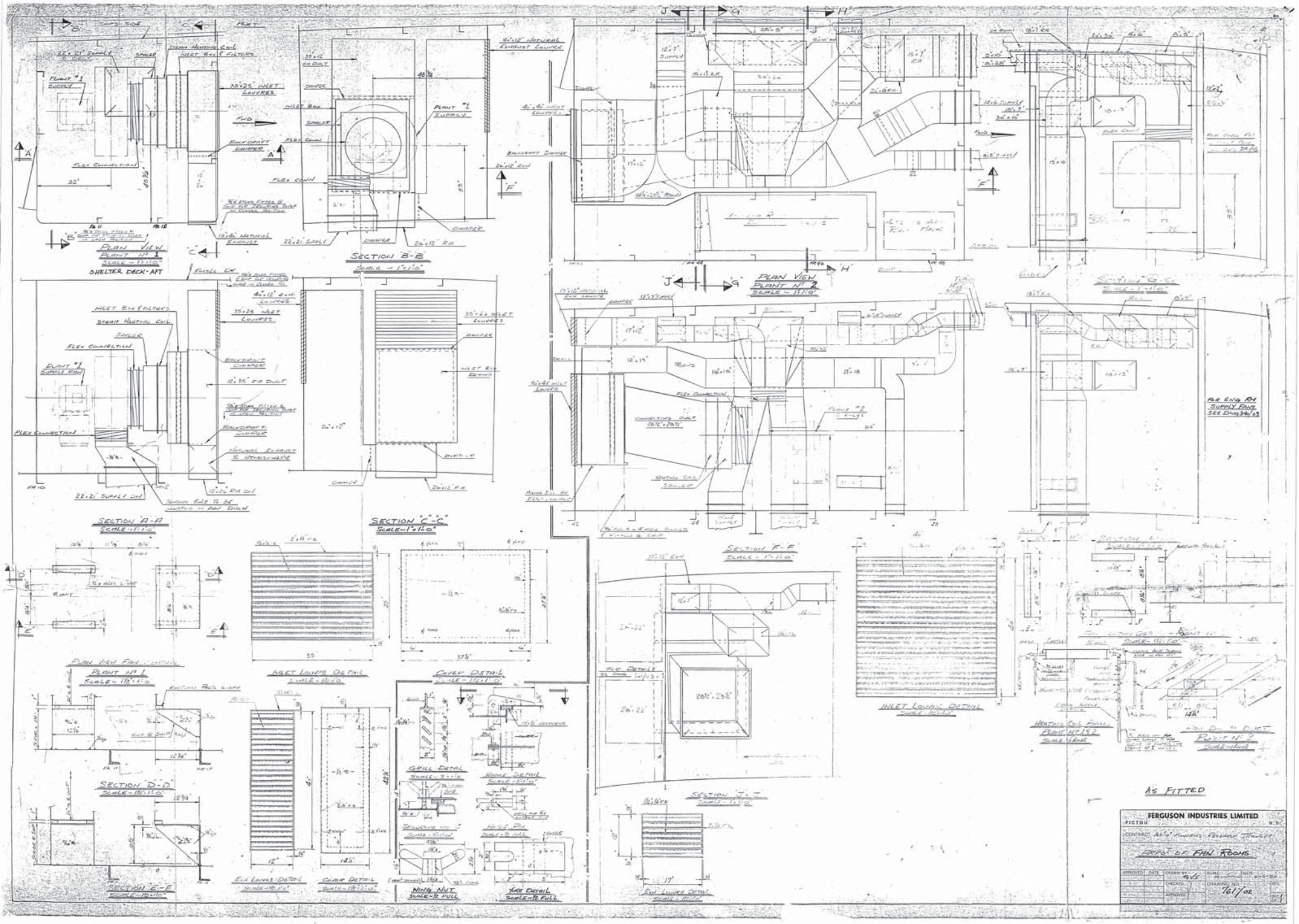
Construction / Type	Lankopack ..... 25 x 7
Minimum Breaking Load	85.8 ..... kN
Diameter	10 ..... mm
Length	39 ..... m

BOAT DATA

Manufacturer / Type	N/A.
Dimensions	N/A.
Total Weight (including Equipment and Personnel)	up to 1000 ..... kg
Maximum No - Lowering	**6 (SIX)** ..... persons
Maximum No - Hoisting	**6 (SIX)** ..... persons


PORT SEA BOX.
Vent
Port Recirc
ROD
X
F/O Cooler
TO A/C P/P
Vent
STBD SEA BOX
Stbd Recicr
TO EVAP
TO BILGE P/P Manifold
SSDG
ME
EMG BILGE SUCTION.
FROM GS P/P
M/E S/W P/P
M/E F/W COOLER
TO GUAP
HYDRAULIC COOLER
4" REDUCER.
PORT GEAR.
STBD GEAR.
GEAR BOX COOLER
3½" REDUCER.
O/B DISC.
C.P P/P COOLER
3" REDUCER
TO SAN P/P & AIR COMPS
O/B DISCH
TO PLUMBER BLOCKS.
SHIP GEN RECIRC LINE
PORT GEN S/W SUPPLY
STBD GEN S/W SUPPLY
M/E RECIRC LINE
SANITARY WATER LINE
1 EVAP
2 GS P/P SUCTION V/VE
3 BILGE SUCTION V/VE
4 #2 SS GD
5 SANITARY WATER LINE
6 M/E SUCTION
7 PORT GEN SUCTION
SPARE - BLANKED OFF
Recirc Valves
SALT WATER SYSTEM.


SHELTER DECK
MAIN DECK
LOWER DECK
WET LAB.
GALLEY STOVES
ENGINE ROOM
LEGEND
NORRIS WARMING CANADA
MONTREAL, CANADA
FERGUSON INDUSTRIES LIMITED
VENTILATION PIPING
GENERAL ARRANGEMENT
DRAWING No. C-1324-1


PLAN VIEW PLANT Nº 1
SHELTER DECK - AFT
SECTION 'B-B'
PLAN VIEW PLANT Nº 2
SECTION 'A-A'
SECTION 'C-C'
SECTION 'D-D'
SECTION 'E-E'
SECTION 'F-F'
SECTION 'G-G'
SECTION 'H-H'
SECTION 'J-J'
INLET LOUVRE DETAIL
COVER DETAIL
GRILL DETAIL
HINGE DETAIL
WING NUT
AXE DETAIL
AS FITTED
FERGUSON INDUSTRIES LIMITED
PICTOU N.S.
DRGS. OF FAN ROOMS
761/02