



**RETURN BIDS TO:**

**RETOURNER LES SOUMISSIONS À:**

Bid Receiving Public Works and Government  
Services Canada/Réception des soumissions  
Travaux publics et Services gouvernementaux  
Canada

1713 Bedford Row  
Halifax, N.S./Halifax, (N.É.)  
Halifax  
Nova Scotia  
B3J 1T3  
Bid Fax: (902) 496-5016

**REQUEST FOR PROPOSAL  
DEMANDE DE PROPOSITION**

**Proposal To: Public Works and Government  
Services Canada**

We hereby offer to sell to Her Majesty the Queen in right of Canada, in accordance with the terms and conditions set out herein, referred to herein or attached hereto, the goods, services, and construction listed herein and on any attached sheets at the price(s) set out therefor.

**Proposition aux: Travaux Publics et Services  
Gouvernementaux Canada**

Nous offrons par la présente de vendre à Sa Majesté la Reine du chef du Canada, aux conditions énoncées ou incluses par référence dans la présente et aux annexes ci-jointes, les biens, services et construction énumérés ici sur toute feuille ci-annexée, au(x) prix indiqué(s).

**Comments - Commentaires**

|  |  |
|--|--|
| <b>Title - Sujet</b> MV Madeleine II Heat Trace Install<br>Madeleine II Heat Tracing System Installation   |  |
| <b>Solicitation No. - N° de l'invitation</b><br>T2012-210151/A   | <b>Date</b><br>2021-11-02                    |
| <b>Client Reference No. - N° de référence du client</b><br>T2012-21-0151   |  |
| <b>GETS Reference No. - N° de référence de SEAG</b><br>PW-\$HAL-202-11394  |  |
| <b>File No. - N° de dossier</b><br>HAL-1-87129 (202)   | <b>CCC No./N° CCC - FMS No./N° VME</b>       |
| <b>Solicitation Closes - L'invitation prend fin</b><br><b>at - à 02:00 PM</b> Atlantic Standard Time AST<br><b>on - le 2021-12-02</b> Heure Normale de l'Atlantique HNA  |  |
| <b>F.O.B. - F.A.B.</b><br><b>Plant-Usine:</b> <input type="checkbox"/> <b>Destination:</b> <input checked="" type="checkbox"/> <b>Other-Autre:</b> <input type="checkbox"/>  |  |
| <b>Address Enquiries to: - Adresser toutes questions à:</b><br>Young, Chris  | <b>Buyer Id - Id de l'acheteur</b><br>hal202 |
| <b>Telephone No. - N° de téléphone</b><br>(902) 476-8829 ( )   | <b>FAX No. - N° de FAX</b><br>(902) 496-5016 |
| <b>Destination - of Goods, Services, and Construction:</b><br><b>Destination - des biens, services et construction:</b><br>T2012<br>PROGRAMS<br>HERITAGE COURT<br>96 FOUNDRY ST P.O. BOX 42<br>MONCTON<br>NEW BRUNSWICK<br>E1C 8K6<br>CANADA |  |

**Instructions: See Herein**

**Instructions: Voir aux présentes**

**Vendor/Firm Name and Address**

**Raison sociale et adresse du  
fournisseur/de l'entrepreneur**

**Issuing Office - Bureau de distribution**

Atlantic Region Acquisitions/Région de l'Atlantique  
Acquisitions  
1713 Bedford Row  
Halifax, N.S./Halifax, (N.É.)  
Halifax  
Nova Scot  
B3J 1T3

|  |  |
|--|--|
| <b>Delivery Required - Livraison exigée</b><br>See Herein – Voir ci-inclus   | <b>Delivery Offered - Livraison proposée</b> |
| <b>Vendor/Firm Name and Address</b><br><b>Raison sociale et adresse du fournisseur/de l'entrepreneur</b>   |  |
| <b>Telephone No. - N° de téléphone</b><br><b>Facsimile No. - N° de télécopieur</b>   |  |
| <b>Name and title of person authorized to sign on behalf of Vendor/Firm</b><br><b>(type or print)</b><br><b>Nom et titre de la personne autorisée à signer au nom du fournisseur/<br/>de l'entrepreneur (taper ou écrire en caractères d'imprimerie)</b> |  |
| <b>Signature</b>   | <b>Date</b>                                  |

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## TABLE OF CONTENTS

|   |           |
|---|-----------|
| <b>PART 1 - GENERAL INFORMATION .....</b>                                       | <b>3</b>  |
| 1.1 INTRODUCTION.....   | 3         |
| 1.2 SUMMARY .....   | 3         |
| 1.3 COVID-19 VACCINATION REQUIREMENT .....                                      | 3         |
| 1.4 DEBRIEFINGS .....   | 3         |
| <b>PART 2 - BIDDER INSTRUCTIONS .....</b>                                       | <b>4</b>  |
| 2.1 STANDARD INSTRUCTIONS, CLAUSES AND CONDITIONS.....                          | 4         |
| 2.2 SUBMISSION OF BIDS.....   | 4         |
| 2.3 ENQUIRIES - BID SOLICITATION.....   | 4         |
| 2.4 APPLICABLE LAWS.....  | 4         |
| 2.5 BIDDERS' CONFERENCE .....   | 5         |
| 2.6 OPTIONAL SITE VISIT.....  | 5         |
| 2.7 WORK PERIOD – MARINE - BID .....  | 6         |
| 2.8 PROJECT SCHEDULE .....  | 6         |
| 2.9 WORKERS COMPENSATION CERTIFICATION- LETTER OF GOOD STANDING.....            | 6         |
| 2.10 WELDING CERTIFICATION - BID.....   | 6         |
| 2.11 EQUIVALENT PRODUCTS .....  | 7         |
| 2.12 BID CHALLENGE AND RECOURSE MECHANISMS.....                                 | 7         |
| 2.13 SAAC MANUAL CLAUSES .....  | 8         |
| <b>PART 3 - BID PREPARATION INSTRUCTIONS.....</b>                               | <b>8</b>  |
| 3.1 BID PREPARATION INSTRUCTIONS .....  | 8         |
| <b>PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION .....</b>              | <b>9</b>  |
| 4.1 EVALUATION PROCEDURES.....  | 9         |
| 4.2 BASIS OF SELECTION.....   | 9         |
| <b>PART 5 – CERTIFICATIONS AND ADDITIONAL INFORMATION .....</b>                 | <b>9</b>  |
| 5.1 CERTIFICATIONS REQUIRED WITH THE BID .....                                  | 10        |
| 5.2 CERTIFICATIONS PRECEDENT TO CONTRACT AWARD AND ADDITIONAL INFORMATION ..... | 10        |
| <b>PART 6 - SECURITY, FINANCIAL AND OTHER REQUIREMENTS.....</b>                 | <b>11</b> |
| 6.1 SECURITY REQUIREMENTS .....   | 11        |
| 6.2 FINANCIAL CAPABILITY .....  | 11        |
| 6.3 INSURANCE REQUIREMENTS .....  | 11        |
| 6.4 ISO 9001:2015 - QUALITY MANAGEMENT SYSTEMS.....                             | 11        |
| <b>PART 7 - RESULTING CONTRACT CLAUSES .....</b>                                | <b>11</b> |
| 7.1 REQUIREMENT .....   | 11        |
| 7.2 STANDARD CLAUSES AND CONDITIONS.....  | 12        |
| 7.3 SECURITY REQUIREMENTS .....   | 12        |
| 7.4 WORK PERIOD – MARINE - CONTRACT.....  | 12        |
| 7.5 AUTHORITIES .....   | 12        |
| 7.6 PAYMENT .....   | 13        |
| 7.7 INVOICING INSTRUCTIONS .....  | 14        |
| 7.8 PROJECT SCHEDULE .....  | 14        |
| 7.9 PROGRESS MEETINGS .....   | 15        |
| 7.10 WELDING CERTIFICATION - CONTRACT .....                                     | 15        |
| 7.11 INSPECTION AND ACCEPTANCE.....   | 15        |

---

|  |  |           |
|--|--|-----------|
| 7.12   | OUTSTANDING WORK AND ACCEPTANCE .....                                  | 15        |
| 7.13   | VESSEL WARRANTY – REFIT AND REPAIR.....                                | 16        |
| 7.14   | WARRANTY – CONTRACTOR RESPONSIBLE FOR ALL COSTS .....                  | 16        |
| 7.15   | CERTIFICATIONS AND ADDITIONAL INFORMATION.....                         | 17        |
| 7.16   | APPLICABLE LAWS.....   | 17        |
| 7.17   | PRIORITY OF DOCUMENTS .....  | 17        |
| 7.18   | INSURANCE REQUIREMENTS .....   | 17        |
| 7.19   | ISO 9001:2015 - QUALITY MANAGEMENT SYSTEMS .....                       | 18        |
| 7.20   | DISPUTE RESOLUTION.....  | 18        |
| <b>ANNEX “A”</b>                                   | .....  | <b>19</b> |
|  | STATEMENT OF WORK .....  | 19        |
| <b>ANNEX “B”</b>                                   | .....  | <b>20</b> |
|  | BASIS OF PAYMENT .....   | 20        |
| <b>ANNEX “C”</b>                                   | .....  | <b>21</b> |
|  | INSURANCE REQUIREMENTS.....  | 21        |
| <b>ANNEX “D”</b>                                   | .....  | <b>24</b> |
|  | WARRANTY DEFECT CLAIM PROCEDURES AND FORMS .....                       | 24        |
|  | APPENDIX 1 TO ANNEX “D” .....  | 27        |
| <b>ANNEX “E” TO PART 3 OF THE BID SOLICITATION</b> | .....  | <b>29</b> |
|  | ELECTRONIC PAYMENT INSTRUMENTS .....                                   | 29        |
| <b>ANNEX “F”</b>                                   | .....  | <b>30</b> |
|  | FINANCIAL BID PRESENTATION SHEET .....                                 | 30        |
| <b>ANNEX “G”</b>                                   | .....  | <b>32</b> |
|  | INTEGRITY PROVISIONS - LIST OF NAMES .....                             | 32        |
| <b>ANNEX “H” TO PART 5 OF THE BID SOLICITATION</b> | .....  | <b>33</b> |
|  | FEDERAL CONTRACTORS PROGRAM FOR EMPLOYMENT EQUITY – CERTIFICATION..... | 33        |
| <b>ANNEX “J” TO PART 5 OF THE BID SOLICITATION</b> | .....  | <b>34</b> |
|  | COVID-19 VACCINATION REQUIREMENT CERTIFICATION.....                    | 34        |
| <b>ANNEX “K”</b>                                   | .....  | <b>35</b> |
|  | MANDATORY TECHNICAL CRITERIA.....                                      | 35        |

## **PART 1 - GENERAL INFORMATION**

### **1.1 Introduction**

The bid solicitation is divided into seven parts plus attachments and annexes, as follows:

- Part 1 General Information: provides a general description of the requirement;
- Part 2 Bidder Instructions: provides the instructions, clauses and conditions applicable to the bid solicitation;
- Part 3 Bid Preparation Instructions: provides Bidders with instructions on how to prepare their bid;
- Part 4 Evaluation Procedures and Basis of Selection: indicates how the evaluation will be conducted, the evaluation criteria that must be addressed in the bid, and the basis of selection;
- Part 5 Certifications and Additional Information: includes the certifications and additional information to be provided;
- Part 6 Security, Financial and Other Requirements: includes specific requirements that must be addressed by Bidders; and
- Part 7 Resulting Contract Clauses: includes the clauses and conditions that will apply to any resulting contract.

The Annexes include the Statement of Work, the Basis of Payment, the Electronic Payment Instruments and the Insurance Requirements.

### **1.2 Summary**

The Contractor must:

- a. carry out the installation work, of the Transport Canada vessel MV Madeleine II, in accordance with the Requirement at Annex "A".
- b. carry out any approved unscheduled work not covered in Annex "A".
- c. This bid solicitation allows bidders to use the epost Connect service provided by Canada Post Corporation to transmit their bid electronically. Bidders must refer to Part 2 entitled Bidder Instructions, and Part 3 entitled Bid Preparation Instructions, of the bid solicitation, for further information.

### **1.3 COVID-19 Vaccination Requirement**

This requirement is subject to the COVID-19 Vaccination Policy for Supplier Personnel. Failure to complete and provide the COVID-19 Vaccination Requirement Certification as part of the bid will render the bid non-responsive.

### **1.4 Debriefings**

Bidders may request a debriefing on the results of the bid solicitation process. Bidders should make the request to the Contracting Authority within 15 working days from receipt of the results of the bid solicitation process. The debriefing may be in writing, by telephone or in person.

## **PART 2 - BIDDER INSTRUCTIONS**

### **2.1 Standard Instructions, Clauses and Conditions**

All instructions, clauses and conditions identified in the bid solicitation by number, date and title are set out in the [Standard Acquisition Clauses and Conditions Manual](https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual) (<https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual>) issued by Public Works and Government Services Canada.

Bidders who submit a bid agree to be bound by the instructions, clauses and conditions of the bid solicitation and accept the clauses and conditions of the resulting contract.

The [2003](#) (2020-05-28) Standard Instructions - Goods or Services - Competitive Requirements, are incorporated by reference into and form part of the bid solicitation.

### **2.2 Submission of Bids**

Bids must be submitted only to Public Works and Government Services Canada (PWGSC) Bid Receiving Unit by the date, time and place indicated in the bid solicitation.

1. epost Connect :

[TPSGC.RARceptionSoumissionsNE-ARBidReceivingNS.PWGSC@tpsgc-pwgsc.gc.ca](mailto:TPSGC.RARceptionSoumissionsNE-ARBidReceivingNS.PWGSC@tpsgc-pwgsc.gc.ca)

Note: Bids will not be accepted if emailed directly to this email address. This email address is to be used to open an epost Connect conversation, as detailed in Standard Instructions [2003](#), or to send bids through an epost Connect message if the bidder is using its own licensing agreement for epost Connect.

**\*\* Please ensure to initiate the ePost conversation at least 6 days prior to bid closing. \*\***

2. Via Facsimile :

Facsimile number: 902-496-5016

### **2.3 Enquiries - Bid Solicitation**

All enquiries must be submitted in writing to the Contracting Authority no later than five (5) calendar days before the bid closing date. Enquiries received after that time may not be answered.

Bidders should reference as accurately as possible the numbered item of the bid solicitation to which the enquiry relates. Care should be taken by Bidders to explain each question in sufficient detail in order to enable Canada to provide an accurate answer. Technical enquiries that are of a proprietary nature must be clearly marked "proprietary" at each relevant item. Items identified as "proprietary" will be treated as such except where Canada determines that the enquiry is not of a proprietary nature. Canada may edit the question(s) or may request that the Bidder do so, so that the proprietary nature of the question(s) is eliminated and the enquiry can be answered to all Bidders. Enquiries not submitted in a form that can be distributed to all Bidders may not be answered by Canada.

### **2.4 Applicable Laws**

Any resulting contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in Nova Scotia.

Bidders may, at their discretion, substitute the applicable laws of a Canadian province or territory of their choice without affecting the validity of their bid, by deleting the name of the Canadian province or territory

specified and inserting the name of the Canadian province or territory of their choice. If no change is made, it acknowledges that the applicable laws specified are acceptable to the Bidders.

## 2.5 Bidders' Conference

A bidders' conference will be held via teleconference on November 19<sup>th</sup>, 2021. The conference will begin at 1:00 PM AST. The scope of the requirement outlined in the bid solicitation will be reviewed during the conference and questions will be answered. It is recommended that bidders who intend to submit a bid attend or send a representative.

Bidders are requested to communicate with the Contracting Authority before the conference to confirm attendance and obtain videoconference login details. Bidders should provide, in writing, to the Contracting Authority, the name(s) of the person(s) who will be attending and a list of issues they wish to table no later than 2 working days before the scheduled conference.

Any clarifications or changes to the bid solicitation resulting from the bidders' conference will be included as an amendment to the bid solicitation. Bidders who do not attend will not be precluded from submitting a bid.

## 2.6 Optional Site Visit

It is recommended that the Bidder or a representative of the Bidder visit the work site. Arrangements have been made for the site visit to be held on board *MV Madeleine II* 17 November 2021, beginning at 0900 local time at 70 Chem. du Débarcadère, Cap-aux-Meules, QC G4T 1S7.

This site visit is subject to the COVID-19 Vaccination Policy for Supplier Personnel. The person(s) who attend must be fully vaccinated against COVID-19 with a Health Canada-approved COVID-19 vaccine(s), or, for personnel that are unable to be vaccinated due to a certified medical contraindication, religion or other prohibited grounds of discrimination under the Canadian Human Rights Act., subject to accommodation and mitigation measures that have been presented to and approved by Canada.

Bidders must communicate with the Contracting Authority no later than 12 November 2021 to confirm attendance and provide the name(s) of the person(s) who will attend. Bidders must also complete and submit the following certification:

I, \_\_\_\_\_ (first and last name), as the representative of \_\_\_\_\_ (name of business) pursuant to \_\_\_\_\_ (insert solicitation number), warrant and certify that all personnel that will attend this site visit on the business' behalf are:

- (a) fully vaccinated against COVID-19 with Health Canada-approved COVID-19 vaccine(s); or
- (b) for personnel that are unable to be vaccinated due to a certified medical contraindication, religion or other prohibited grounds of discrimination under the Canadian Human Rights Act., subject to accommodation and mitigation measures that have been presented to and approved by Canada.

I certify that all personnel that will attend on behalf of \_\_\_\_\_ (name of business) have been notified of the vaccination requirements of the Government of Canada's COVID-19 Vaccination Policy for Supplier Personnel, and that the \_\_\_\_\_ (name of business) has certified to their compliance with this requirement.

I certify that the information provided is true as of the date indicated below and will continue to be true for the duration of the site visit. I understand that the certifications provided to Canada are subject to verification at all times. Canada reserves the right to request additional information to verify the

certifications at all times. I also understand that Canada will declare a bid non-responsive or a contractor in default, if a certification is found to be untrue, whether made knowingly or unknowingly.

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Information you provide on this Certification Form and in accordance with the Government of Canada's COVID-19 Vaccination Policy for Supplier Personnel will be protected, used, stored and disclosed in accordance with the Privacy Act. Please note that you have a right to access and correct any information on your file, and you have a right to file a complaint with the Office of the Privacy Commissioner regarding the handling of your personal information. These rights also apply to all individuals who are deemed to be personnel for the purpose for the Contract and who require access to federal government workplaces where they may come into contact with public servants.

Bidders who do not confirm attendance, provide the name(s) of the person(s) who will attend, or who do not complete and submit the above certification as required will not be allowed access to the site. Bidders will be requested to sign an attendance sheet. No alternative appointment will be given to bidders who do not attend or do not send a representative. Bidders who do not participate in the visit will not be precluded from submitting a bid. Any clarifications or changes to the bid solicitation resulting from the site visit will be included as an amendment to the bid solicitation.

## 2.7 Work Period – Marine - Bid

Work must commence and be completed as follows:

Commence: 13 December 2021

Complete: 11 February 2022.

By submitting a bid, the Bidder certifies that they have sufficient material and human resources allocated or available and that the above work period is adequate to both complete the known work and absorb a reasonable amount of unscheduled work.

## 2.8 Project Schedule

As part of its technical bid, the Bidder must propose its preliminary project schedule, in Gantt chart format. The project schedule must include the Bidder's work breakdown structure, the scheduling of main activities and milestone events, and any potential problem areas involved in completing the Work.

## 2.9 Workers Compensation Certification- Letter of Good Standing

The Bidder must have an account in good standing with the applicable provincial or territorial Workers' Compensation Board.

The Bidder must provide, within two (2) days following a request from the Contracting Authority, a certificate or letter from the applicable Workers' Compensation Board confirming the Bidder's good standing account. Failure to comply with the request may result in the bid being declared non-responsive.

## 2.10 Welding Certification - Bid

1. Welding must be performed by a welder certified by the Canadian Welding Bureau (CWB) for the following Canadian Standards Association (CSA) standards:
  - a. CSA W47.1 (current version), Certification of Companies for Fusion Welding of Steel (Division 1, 2.1 or 2.2);
  - b. CSA W47.2 (current version), Certification of Companies for Fusion Welding of Aluminum

(Division 1, 2.1 or 2.2);

2. Before contract award and within two (2) calendar days of the written request by the Contracting Authority, the successful Bidder must submit evidence demonstrating its or its subcontractor's certification by CWB in accordance with the CSA welding standards.

### 2.11 Equivalent Products

1. Products that are equivalent in form, fit, function and quality to the item(s) specified in the bid solicitation will be considered where the Bidder:
  - a. designates the brand name, model and/or part number of the substitute product;
  - b. states that the substitute product is fully interchangeable with the item specified;
  - c. provides complete specifications and descriptive literature for each substitute product;
  - d. provides compliance statements that include technical specifics showing the substitute product meets all mandatory performance criteria that are specified in the bid solicitation; and
  - e. clearly identifies those areas in the specifications and descriptive literature that support the substitute product's compliance with any mandatory performance criteria.
2. Products offered as equivalent in form, fit, function and quality will not be considered if:
  - a. the bid fails to provide all the information requested to allow the Contracting Authority to fully evaluate the equivalency of each substitute product; or
  - b. the substitute product fails to meet or exceed the mandatory performance criteria specified in the bid solicitation for that item.
3. In conducting its evaluation of the bids, Canada may, but will have no obligation to, request bidders offering a substitute product to demonstrate, at the sole cost of bidders, that the substitute product is equivalent to the item specified in the bid solicitation.
4. All proposed equivalents must be submitted in writing to the Contracting Authority no later than seven (7) calendar days before the bid closing date. Enquiries received after that time may not be considered.

B3000T (2006-06-16)

### 2.12 Bid Challenge and Recourse Mechanisms

- (a) Several mechanisms are available to potential suppliers to challenge aspects of the procurement process up to and including contract award.
- (b) Canada encourages suppliers to first bring their concerns to the attention of the Contracting Authority. Canada's [Buy and Sell](#) website, under the heading "[Bid Challenge and Recourse Mechanisms](#)" contains information on potential complaint bodies such as:
  - Office of the Procurement Ombudsman (OPO)
  - Canadian International Trade Tribunal (CITT)
- (c) Suppliers should note that there are **strict deadlines** for filing complaints, and the time periods vary depending on the complaint body in question. Suppliers should therefore act quickly when they want to challenge any aspect of the procurement process.

## 2.13 SAAC Manual Clauses

A7035T (2007-05-25) List of Proposed Sub-contractors  
A9125T (2007-05-25) Valid Labour Agreement

## PART 3 - BID PREPARATION INSTRUCTIONS

### 3.1 Bid Preparation Instructions

If the Bidder chooses to submit its bid electronically, Canada requests that the Bidder submits its bid in accordance with section 08 of the 2003 standard instructions. The epost Connect system has a limit of 1GB per single message posted and a limit of 20GB per conversation.

The bid must be gathered per section and separated as follows:

Section I: Technical Bid  
Section II: Financial Bid  
Section III: Certifications

If the Bidder is simultaneously providing copies of its bid using multiple acceptable delivery methods, and if there is a discrepancy between the wording of any of these copies and the electronic copy provided through epost Connect service, the wording of the electronic copy provided through epost Connect service will have priority over the wording of the other copies.

Prices must appear in the financial bid only. No prices must be indicated in any other section of the bid.

Canada requests that bidders follow the format instructions described below in the preparation of hard copy of their bid:

- (a) use 8.5 x 11 inch (216 mm x 279 mm) paper;
- (b) use a numbering system that corresponds to the bid solicitation.

#### Section I: Technical Bid

In their technical bid, Bidders should demonstrate their understanding of the requirements contained in the bid solicitation and explain how they will meet these requirements. Bidders should demonstrate their capability and describe their approach in a thorough, concise and clear manner for carrying out the work.

The technical bid should address clearly and in sufficient depth the points that are subject to the evaluation criteria against which the bid will be evaluated. Simply repeating the statement contained in the bid solicitation is not sufficient. In order to facilitate the evaluation of the bid, Canada requests that Bidders address and present topics in the order of the evaluation criteria under the same headings. To avoid duplication, Bidders may refer to different sections of their bids by identifying the specific paragraph and page number where the subject topic has already been addressed.

#### Section II: Financial Bid

**3.1.1** Bidders must submit their financial bid in accordance with the "Financial Bid Presentation Sheet" in Annex "F". The total amount of Applicable Taxes must be shown separately, if applicable.

#### 3.1.2 Electronic Payment of Invoices – Bid

If you are willing to accept payment of invoices by Electronic Payment Instruments, complete Annex "E" Electronic Payment Instruments, to identify which ones are accepted.

If Annex "E" Electronic Payment Instruments is not completed, it will be considered as if Electronic Payment Instruments are not being accepted for payment of invoices.

Acceptance of Electronic Payment Instruments will not be considered as an evaluation criterion.

### **3.1.3 SACC Manual Clauses**

C0414T (2008-05-12) Vessel Refit, Repair or Docking – Cost  
C0417T (2008-05-12) Unscheduled Work and Evaluation Price

### **Section III: Certifications**

Bidders must submit the certifications and additional information required under Part 5.

## **PART 4 - EVALUATION PROCEDURES AND BASIS OF SELECTION**

### **4.1 Evaluation Procedures**

- (a) Bids will be assessed in accordance with the entire requirement of the bid solicitation including the technical and financial evaluation criteria.
- (b) An evaluation team composed of representatives of Canada will evaluate the bids.

#### **4.1.1 Technical Evaluation**

##### **4.1.1.1 Mandatory Technical Criteria**

Bids must meet all Mandatory Criteria MT1 – MT3 as stated in Annex "K" Contractor Selection Method – Selection Criteria.

The Bidder's proposal must meet all mandatory requirements in order to be evaluated. The bidder is to provide proof that each mandatory requirement is met. Failure to do this will result in no further evaluation being conducted. Bidders must complete the checklist provided in Annex "K" and include it in the bid submission package.

### **4.2 Basis of Selection**

A bid must comply with all requirements of the bid solicitation to be declared responsive. The responsive bid with the lowest evaluated price will be recommended for award of a contract.

## **PART 5 – CERTIFICATIONS AND ADDITIONAL INFORMATION**

Bidders must provide the required certifications and additional information to be awarded a contract.

The certifications provided by Bidders to Canada are subject to verification by Canada at all times. Unless specified otherwise, Canada will declare a bid non-responsive, or will declare a contractor in default if any certification made by the Bidder is found to be untrue, whether made knowingly or unknowingly, during the bid evaluation period or during the contract period.

The Contracting Authority will have the right to ask for additional information to verify the Bidder's certifications. Failure to comply and to cooperate with any request or requirement imposed by the Contracting Authority will render the bid non-responsive or constitute a default under the Contract.

## 5.1 Certifications Required with the Bid

Bidders must submit the following duly completed certifications as part of their bid.

### 5.1.1 Integrity Provisions - Declaration of Convicted Offences

In accordance with the Integrity Provisions of the Standard Instructions, all bidders must provide with their bid, **if applicable**, the Integrity declaration form available on the [Forms for the Integrity Regime](http://www.tpsgc-pwgsc.gc.ca/ci-if/declaration-eng.html) website (<http://www.tpsgc-pwgsc.gc.ca/ci-if/declaration-eng.html>), to be given further consideration in the procurement process.

### 5.1.2 COVID-19 Vaccination Requirement Certification

In accordance with the COVID-19 Vaccination Policy for Supplier Personnel, all Bidders must provide with their bid, the COVID-19 Vaccination Requirement Certification attached to this bid solicitation, to be given further consideration in this procurement process. This Certification incorporated into the bid solicitation on its closing date is incorporated into, and forms a binding part of any resulting Contract.

## 5.2 Certifications Precedent to Contract Award and Additional Information

The certifications and additional information listed below should be submitted with the bid but may be submitted afterwards. If any of these required certifications or additional information is not completed and submitted as requested, the Contracting Authority will inform the Bidder of a time frame within which to provide the information. Failure to provide the certifications or the additional information listed below within the time frame specified will render the bid non-responsive.

### 5.2.1 Integrity Provisions – Required Documentation

In accordance with the section titled Information to be provided when bidding, contracting or entering into a real property agreement of the [Ineligibility and Suspension Policy](http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html) (<http://www.tpsgc-pwgsc.gc.ca/ci-if/politique-policy-eng.html>), the Bidder must provide the required documentation, as applicable, to be given further consideration in the procurement process.

### 5.2.2 Federal Contractors Program for Employment Equity - Bid Certification

By submitting a bid, the Bidder certifies that the Bidder, and any of the Bidder's members if the Bidder is a Joint Venture, is not named on the Federal Contractors Program (FCP) for employment equity "FCP Limited Eligibility to Bid" list available at the bottom of the page of the Employment and Social Development Canada (ESDC) - Labour's website (<https://www.canada.ca/en/employment-social-development/programs/employment-equity/federal-contractor-program.html#>).

Canada will have the right to declare a bid non-responsive if the Bidder, or any member of the Bidder if the Bidder is a Joint Venture, appears on the "FCP Limited Eligibility to Bid" list at the time of contract award.

Canada will also have the right to terminate the Contract for default if a Contractor, or any member of the Contractor if the Contractor is a Joint Venture, appears on the "FCP Limited Eligibility to Bid" list during the period of the Contract.

The Bidder must provide the Contracting Authority with a completed annex Federal Contractors Program for Employment Equity - Certification, before contract award. If the Bidder is a Joint Venture, the Bidder must provide the Contracting Authority with a completed annex Federal Contractors Program for Employment Equity - Certification, for each member of the Joint Venture.

### **5.2.3 Additional Certifications Precedent to Contract Award**

- a. Project Schedule
- b. Workers Compensation Certification- Letter of Good Standing
- c. Valid Canadian Welding Bureau Certification
- d. List of Proposed Sub-contractors
- e. Valid Labour Agreement
- f. Insurance Certificate or Letter from Insurance Broker
- g. ISO Registration Documentation
- h. Integrity Provisions – Required Documentation
- i. Federal Contractors Program for Employment Equity Certification
- j. COVID-19 Vaccination Requirement Certification

## **PART 6 - SECURITY, FINANCIAL AND OTHER REQUIREMENTS**

### **6.1 Security Requirements**

There is no security requirement associated with the requirement.

### **6.2 Financial Capability**

*SACC Manual* clause [A9033T](#) (2012-07-16) Financial Capability

### **6.3 Insurance Requirements**

The Bidder must provide a letter from an insurance broker or an insurance company licensed to operate in Canada stating that the Bidder, if awarded a contract as a result of the bid solicitation, can be insured in accordance with the Insurance Requirements specified in Annex "C".

If the information is not provided in the bid, the Contracting Authority will so inform the Bidder and provide the Bidder with a time frame within which to meet the requirement. Failure to comply with the request of the Contracting Authority and meet the requirement within that time period will render the bid non-responsive.

### **6.4 ISO 9001:2015 - Quality Management Systems**

Before contract award and within two (2) calendar days of written notification by the Contracting Authority the Bidder must provide its current ISO Registration Documentation indicating its registration to ISO 9001:2015. Documentation and procedures of bidders not registered to the ISO standards may be subject to a Quality System Evaluation (QSE) by the Inspection Authority or designate before award of a contract.

## **PART 7 - RESULTING CONTRACT CLAUSES**

The following clauses and conditions apply to and form part of any contract resulting from the bid solicitation.

### **7.1 Requirement**

The Contractor must:

- a. carry out the installation work, of the Transport Canada vessel MV Madeleine II, in accordance with the Requirement at Annex "A".
- b. carry out any approved unscheduled work not covered in Annex "A".

## **7.2 Standard Clauses and Conditions**

All clauses and conditions identified in the Contract by number, date and title are set out in the [Standard Acquisition Clauses and Conditions Manual](https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual) (https://buyandsell.gc.ca/policy-and-guidelines/standard-acquisition-clauses-and-conditions-manual) issued by Public Works and Government Services Canada.

### **7.2.1 General Conditions**

2030 (2020-05-28), General Conditions - Higher Complexity - Goods, apply to and form part of the Contract.

### **7.2.2 Supplemental General Conditions**

7.2.2.1 1029 (2018-12-06) Ship Repairs, apply to and form part of the Contract.

7.2.2.2 4013 Compliance with on-site measures, standing orders, policies and rules

The Contractor must comply and ensure that its employees and subcontractors comply with all security measures, standing orders, policies or other rules in force at the site where the Work is performed.

## **7.3 Security Requirements**

7.3.1 There is no security requirement applicable to the Contract.

## **7.4 Work Period – Marine - Contract**

Work must commence and be completed as follows:

Commence: 13 December 2021

Complete: 11 February 2022.

By submitting a bid, the Bidder certifies that they have sufficient material and human resources allocated or available and that the above work period is adequate to both complete the known work and absorb a reasonable amount of unscheduled work.

## **7.5 Authorities**

### **7.5.1 Contracting Authority**

The Contracting Authority for the Contract is:

Name: Chris Young  
Title: Supply Team Leader  
Public Works and Government Services Canada  
Acquisitions Branch  
Atlantic Region

Address: 1713 Bedford Row  
Halifax, Nova Scotia  
B3J 1T3

Telephone: 902-476-8829

E-mail address: Christopher.Young@pwgsc.gc.ca

The Contracting Authority is responsible for the management of the Contract and any changes to the Contract must be authorized in writing by the Contracting Authority. The Contractor must not perform

Solicitation No. - N° de l'invitation  
T2012-210151/A  
Client Ref. No. - N° de réf. du client  
T2012-210151

Amd. No. - N° de la modif.  
File No. - N° du dossier  
HAL-1-87129

Buyer ID - Id de l'acheteur  
HAL202  
CCC No./N° CCC - FMS No./N° VME

work in excess of or outside the scope of the Contract based on verbal or written requests or instructions from anybody other than the Contracting Authority.

### 7.5.2 Technical Authority

The Technical Authority for the Contract is: *(will be provided at contract award)*

Name: \_\_\_\_\_

Title: Technical Advisor

Organization: Transport Canada  
Address: Transport Canada Marine Programs  
45 Alderney Drive  
Dartmouth NS B2Y 4K2

Telephone: \_\_\_\_ \_\_\_\_ \_\_\_\_\_

E-mail address: \_\_\_\_\_

The Project Authority is the representative of the department or agency for whom the Work is being carried out under the Contract and is responsible for all matters concerning the technical content of the Work under the Contract. Technical matters may be discussed with the Project Authority; however, the Project Authority has no authority to authorize changes to the scope of the Work. Changes to the scope of the Work can only be made through a contract amendment issued by the Contracting Authority.

### 7.5.3 Contractor's Representative

Name: \_\_\_\_\_

Title: \_\_\_\_\_

Organization: \_\_\_\_\_

Address: \_\_\_\_\_

Telephone: \_\_\_\_ \_\_\_\_ \_\_\_\_\_

Facsimile: \_\_\_\_ \_\_\_\_ \_\_\_\_\_

E-mail address: \_\_\_\_\_

## 7.6 Payment

### 7.6.1 Basis of Payment

In consideration of the Contractor satisfactorily completing all of its obligations under the Contract, the Contractor will be paid a firm price as specified in Annex "B". Customs duties are included and Goods and Services Tax or Harmonized Sales Tax is extra, if applicable.

Canada will not pay the Contractor for any design changes, modifications or interpretations of the Work, unless they have been approved, in writing, by the Contracting Authority before their incorporation into the Work.

### 7.6.2 Limitation of Price

SACC Manual clause [C6000C](#) (2017-08-17) Limitation of Price

### **7.6.3 Single Payment**

Canada will pay the Contractor upon completion and delivery of the Work in accordance with the payment provisions of the Contract if:

- a. an accurate and complete invoice and any other documents required by the Contract have been submitted in accordance with the invoicing instructions provided in the Contract;
- b. all such documents have been verified by Canada;
- c. the Work delivered has been accepted by Canada.

### **7.6.4 Electronic Payment of Invoices – Contract**

The Contractor accepts to be paid using any of the following Electronic Payment Instrument(s):

- a. Visa Acquisition Card;
- b. MasterCard Acquisition Card;
- c. Direct Deposit (Domestic and International);
- d. Electronic Data Interchange (EDI);
- e. Wire Transfer (International Only);

### **7.7 Invoicing Instructions**

The Contractor must submit invoices in accordance with the section entitled "Invoice Submission" of the general conditions. Invoices cannot be submitted until all work identified in the invoice is completed.

Invoices must be distributed as follows:

TRANSPORT CANADA  
PROGRAMS  
HERITAGE COURT  
95 FOUNDRY ST P.O.BOX 42  
MONCTON NB E1C 8K6

Att.: *(will be provided at contract award)*

The original invoice must be sent for verification to:

Public Works and Government Services Canada  
Acquisitions Marine  
1713 Bedford Row  
Halifax, NS  
B3J 3C9

Att.: Chris Young

### **7.8 Project Schedule**

The Contractor must provide a detailed project schedule in Gantt chart format to the Contracting Authority and the Technical Authority one (1) week after award of Contract. The project schedule must include the work breakdown structure, the scheduling of main activities and milestone events, and any potential problem areas involved in completing the Work.

## **7.9 Progress Meetings**

Progress meetings, chaired by the Contracting Authority, will take place at the Contractor's facility as and when required, generally once a week. Interim meetings may also be scheduled. Contractor's attendees at these meetings will, as a minimum, be its Contract (Project) Manager, Production Manager (Superintendent) and Quality Assurance Manager. Progress meetings will generally incorporate technical meetings to be chaired by the Technical Authority.

## **7.10 Welding Certification - Contract**

The Contractor must ensure that welding is performed by a welder certified by the Canadian Welding Bureau(CWB) for the following Canadian Standards Association(CSA) standard(s):

- a. CSA W47.1 (current version), Certification of Companies for Fusion Welding of Steel
- b. (Division 1, 2.1 or 2.2);
- c. CSA W47.2 (current version), Certification of Companies for Fusion Welding of Aluminum (Division 1, 2.1 or 2.2);

In addition, welding must be done in accordance with the requirements of the applicable drawings and specifications.

Before the commencement of any fabrication work, and upon request from the Technical Authority, the Contractor must provide approved welding procedures and/or a list of welding personnel they intend to use in the performance of the Work. The list must identify the CWB welding procedure qualifications attained by each of the personnel listed and must be accompanied by a copy of each person's current CWB certification to CSA welding standards.

## **7.11 Inspection and Acceptance**

The Technical Authority is the Inspection Authority. All reports, deliverable items, documents, goods and all services rendered under the Contract are subject to inspection by the Inspection Authority or representative. Should any report, document, good or service not be in accordance with the requirements of the Statement of Work and to the satisfaction of the Inspection Authority, as submitted, the Inspection Authority will have the right to reject it or require its correction at the sole expense of the Contractor before recommending payment.

## **7.12 Outstanding Work and Acceptance**

The Inspection Authority, in conjunction with the Contractor, will prepare a list of outstanding work items at the end of the work period. This list will form the annexes to the formal acceptance document for the vessel. A contract completion meeting will be convened by the Inspection Authority on the work completion date to review and sign off the form PWGSC-TPSGC 1205, Acceptance. In addition to any amount held under the Warranty Holdback Clause, a holdback of twice the estimated value of outstanding work will be held until that work is completed.

The Contractor must complete the above form in three (3) copies, which will be distributed by the Inspection Authority as follows:

- a. original to the Contracting Authority;
- b. one copy to the Technical Authority;
- c. one copy to the Contractor.

### **7.13 Vessel Warranty – Refit and Repair**

The warranty clause of the general conditions forming part of the Contract is deleted and replaced by the following:

"08 Warranty"

The Contractor, if requested by Canada, must replace or repair at its own expense any finished work, excluding Government Issue incorporated in the Work, which becomes defective or which fails to conform to contract requirements as a result of faulty or inefficient manufacture, material or workmanship.

Despite acceptance of the finished work, and without restricting any other term of the Contract or any condition, warranty or provision imposed by law, the Contractor warrants that the following will be free from all defects and will conform with the requirements of the Contract:

The painting of the underwater portion of the hull for a period of 365 days commencing from the date of undocking, except that the Contractor will only be liable to repair and/or replace to a value to be determined as follows:

Original cost to Canada of the underwater painting work, divided by 365 days and multiplied by the number of days remaining in the warranty period. The resultant sum would represent the "Dollar Credit" due to Canada from the Contractor.

All other painting work for a period of 365 days commencing from the date of acceptance of the Work;

All other items of work for a period of ninety (90) days commencing from the date of acceptance of the Work, except that:

the warranty on the work related to any system or equipment not immediately placed in continuous use or service will be for a period of ninety (90) days from the date of acceptance of the vessel;

for all outstanding defects, deviations, and work items listed on the Acceptance Document at Delivery, the warranty will be ninety (90) days from the subsequent date of acceptance for each item.

The Contractor agrees to pass to Canada, and exercise on behalf of Canada, all warranties on the materials supplied or held by the Contractor which exceed the periods indicated above.

Refer to Annex "D" for Warranty Defect Claim Procedures and forms.

### **7.14 Warranty – Contractor responsible for all costs**

Section 22 entitled Warranty of general conditions 2030 is amended by deleting subsections 3 and 4 in its entirety and replacing it with the following:

The Work or any part of the Work found to be defective or non-conforming will be returned to the Contractor's plant for replacement, repair or making good. However, when in the opinion of Canada it is not expedient to remove the Work from its location, the Contractor must carry out any necessary repair or making good of the Work at that location. In such cases, the Contractor will be responsible for all Costs (including travel and living expenses) incurred in so doing, Canada will not reimburse these Costs.

The Contractor must pay the transportation cost associated with returning the Work or any part of the Work to the Contractor's plant pursuant to subsection 3. The Contractor must also pay the transportation cost associated with forwarding the replacement or returning the Work or part of the Work when rectified to the delivery point specified in the Contract or to another location directed by Canada.

All other provisions of the warranty section remain in effect.

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## 7.15 Certifications and Additional Information

### 7.15.1 Compliance

Unless specified otherwise, the continuous compliance with the certifications provided by the Contractor in its bid or precedent to contract award, and the ongoing cooperation in providing additional information are conditions of the Contract and failure to comply will constitute the Contractor in default. Certifications are subject to verification by Canada during the entire period of the Contract.

### 7.15.2 SACC Manual Clauses

|                     |   |
|---------------------|---|
| A0285C (2007-05-25) | Workers Compensation                            |
| A9047C (2008-05-12) | Title to Property – Vessel                      |
| B5007C (2010-01-11) | Procedures for Design Change or Additional Work |
| B6100C (2008-05-12) | Stability                                       |
| B9035C (2008-05-12) | Progress Meetings                               |
| A0290C (2008-05-12) | Hazardous Waste – Vessels                       |
| A9055C (2010-08-16) | Scrap and Waste Material                        |
| A9068C (2010-01-11) | Government Site Regulations                     |
| B1501C (2018-06-31) | Electrical Equipment                            |
| A9006C (2012-07-16) | Defence Contract                                |
| A0032C (2011-05-16) | Vessel Manned Refits                            |
| A9014C (2013-04-25) | Outstanding Work and Acceptance - Civilian      |

### 7.16 Applicable Laws

The Contract must be interpreted and governed, and the relations between the parties determined, by the laws in force in Nova Scotia.

### 7.17 Priority of Documents

If there is a discrepancy between the wording of any documents that appear on the list, the wording of the document that first appears on the list has priority over the wording of any document that subsequently appears on the list.

- a) the Articles of Agreement;
- b) the supplemental general conditions 1029 (2018-12-06);
- c) the supplemental general conditions 4013;
- d) the general conditions 2030 (2020-05-28);
- e) Annex "A", Statement of Work;
- f) Annex "B", Basis of Payment;
- g) Annex "F", Financial Bid Presentation Sheet;
- h) Annex "C", Insurance Requirements;
- i) Annex "J", COVID-19 Vaccination Requirement Certification
- j) the Contractor's bid dated \_\_\_\_\_

### 7.18 Insurance Requirements

The Contractor must comply with the insurance requirements specified in Annex "C". The Contractor must maintain the required insurance coverage for the duration of the Contract. Compliance with the insurance requirements does not release the Contractor from or reduce its liability under the Contract.

The Contractor is responsible for deciding if additional insurance coverage is necessary to fulfill its obligation under the Contract and to ensure compliance with any applicable law. Any additional insurance coverage is at the Contractor's expense, and for its own benefit and protection.

The Contractor must forward to the Contracting Authority within ten (10) days after the date of award of the Contract, a Certificate of Insurance evidencing the insurance coverage and confirming that the insurance policy complying with the requirements is in force. Coverage must be placed with an Insurer licensed to carry out business in Canada. The Contractor must, if requested by the Contracting Authority, forward to Canada a certified true copy of all applicable insurance policies.

### **7.19 ISO 9001:2015 - Quality Management Systems**

In the performance of the Work described in the Contract, the Contractor must comply with the requirements of:

ISO 9001:2015 - Quality management systems - Requirements, published by the International Organization for Standardization (ISO), current edition at date of submission of the Contractor's bid with the exclusion of the following requirement:

Design and development.

It is not the intent of this clause to require that the Contractor be registered to the applicable standard; however, the Contractor's quality management system must address each requirement contained in the standard.

#### **Assistance for Government Quality Assurance (GQA):**

The Contractor must provide the Inspection Authority or designate with the accommodation and facilities required for the proper accomplishment of GQA and must provide any assistance required by the Inspection Authority for evaluation, verification, validation, documentation or release of product. The Inspection Authority or designate must have the right of access to any area of the Contractor's or Subcontractor's facilities where any part of the Work is being performed.

The Inspection Authority or designate must be afforded unrestricted opportunity to evaluate and verify Contractor conformity with Quality System procedures and to validate product conformity with contract requirements. The Contractor must make available, for reasonable use by the Inspection Authority or designate, the equipment necessary for all validation purposes. Contractor personnel must be made available for operation of such equipment as required.

When the Inspection Authority or designate determines that GQA is required at a subcontractor's facilities, the Contractor must provide for this in the purchasing document and forward copies to the Inspection Authority or designate, together with relevant technical data as the Inspection Authority or designate may request. The Contractor must notify the Inspection Authority or designate of non-conforming product received from a subcontractor when the product has been subject to GQA.

### **7.20 Dispute Resolution**

- (a) The parties agree to maintain open and honest communication about the Work throughout and after the performance of the contract.
- (b) The parties agree to consult and co-operate with each other in the furtherance of the contract and promptly notify the other party or parties and attempt to resolve problems or differences that may arise.
- (c) If the parties cannot resolve a dispute through consultation and cooperation, the parties agree to consult a neutral third party offering alternative dispute resolution services to attempt to address the dispute.
- (d) Options of alternative dispute resolution services can be found on Canada's Buy and Sell website under the heading "[Dispute Resolution](#)".

Solicitation No. - N° de l'invitation  
T2012-210151/A  
Client Ref. No. - N° de réf. du client  
T2012-210151

Amd. No. - N° de la modif.  
File No. - N° du dossier  
HAL-1-87129

Buyer ID - Id de l'acheteur  
HAL202  
CCC No./N° CCC - FMS No./N° VME

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## **ANNEX "A"**

### **STATEMENT OF WORK**

The entire Statement of Work is a separate electronic document entitled:

**HEAT TRACE INSTALLATION SOW  
MADELEINE II  
DOC #: 21075-100-SPC-040  
REVISION: 2**

Bidders requiring a copy of the technical drawings are to submit an email request directly to the Contracting Authority.

**ANNEX “B”**

**BASIS OF PAYMENT**

***Remark to Bidder: Annex B will form the Basis of Payment for the resulting contract and should not be filled in at the bid submission stage. Refer to Annex F “Financial Bid Presentation Sheet”.***

**1. Contract Price**

|    |   |          |
|----|---|----------|
| a) | <b>Known Work</b><br>For work Specified in Annex “A” for a FIRM PRICE of: | \$ _____ |
| b) | <b>HST</b>  | \$ _____ |
| c) | <b>Total Firm Price</b><br>HST included:<br><br>For a FIRM PRICE of :     | \$ _____ |

**2. Unscheduled Work**

**2.1 Price Breakdown:**

The Contractor must, upon request, provide a price breakdown for all unscheduled work, by specific activities with trades, person-hours, material, subcontracts and services.

**2.2 Pro-rated Prices:**

Hours and prices for unscheduled work will be based on comparable historical data applicable to similar work at the same facility, or will be determined by pro-rating the quoted work costs in the Contract when in similar areas of the vessel.

**2.3 Payment for Unscheduled Work:**

The Contractor will be paid for unscheduled work arising, as authorized by Canada. The authorized unscheduled work will be calculated as follows:

Number of hours (to be negotiated) x \$ \_\_\_\_\_, being the Contractor's firm hourly charge-out labour rate which includes overhead and profit, plus net laid-down cost of materials to which will be added a mark-up of 10 percent, plus Goods and Services Tax or Harmonized Sales Tax, if applicable, calculated at 15 percent 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 term of the Contract and any subsequent amendments.

C0902C (2013-04-25)

**3. Overtime**

No overtime work will be compensated for under the Contract unless authorized in advance and in writing by the Contracting Authority. Any request for payment must be accompanied by a copy of the overtime authorization and a report containing such details as Canada may require with respect to the overtime work performed. Compensation for authorized overtime will be calculated by taking the average hourly direct labour rate premiums, plus certified fringe benefit additives, plus profit of 7 1/2 percent on labour premium and fringe benefits. These rates will remain firm for the duration of the Contract including all amendments and are subject to audit if deemed necessary by Canada.

## **ANNEX "C"**

### **INSURANCE REQUIREMENTS**

#### **C1 Ship Repairers' Liability Insurance**

1. The Contractor must obtain Ship Repairers' Liability Insurance and maintain it in force throughout the duration of the Contract, in an amount usual for a contract of this nature, but for not less than \$10,000,000 per accident or occurrence and in the annual aggregate.
2. The Ship Repairers' Liability insurance must include the following:
  - a. Additional Insured: Canada is added as an additional insured, but only with respect to liability arising out of the Contractor's performance of the Contract. The interest of Canada as additional insured should read as follows: Canada, represented by Public Works and Government Services Canada.
  - b. Waiver of Subrogation Rights: Contractor's Insurer to waive all rights of subrogation against Canada as represented by Transport Canada and Public Works and Government Services Canada for any and all loss of or damage to the vessel, however caused.
  - c. Notice of Cancellation: The Contractor will provide the Contracting Authority thirty (30) days prior written notice of policy cancellation or any changes to the insurance policy.
  - d. Contractual Liability: The policy must, on a blanket basis or by specific reference to the contract, extend to assumed liabilities with respect to contractual provisions.
  - e. Cross Liability/Separation of Insureds: Without increasing the limit of liability, the policy must protect all insured parties to the full extent of coverage provided. Further, the policy must apply to each Insured in the same manner and to the same extent as if a separate policy had been issued to each.
  - f. Litigation Rights: Pursuant to subsection 5(d) of the Department of Justice Act, S.C. 1993, c. J-2, s.1, if a suit is instituted for or against Canada which the Insurer would, but for this clause, have the right to pursue or defend on behalf of Canada as an Additional Named Insured under the insurance policy, the Insurer must promptly contact the Attorney General of Canada to agree on the legal strategies by sending a letter, by registered mail or by courier, with an acknowledgement of receipt.

#### **For the province of Quebec, send to:**

Director Business Law Directorate,  
Quebec Regional Office (Ottawa),  
Department of Justice,  
284 Wellington Street, Room SAT-6042,  
Ottawa, Ontario, K1A 0H8

#### **For other provinces and territories, send to:**

Senior General Counsel,  
Civil Litigation Section,  
Department of Justice  
234 Wellington Street, East Tower  
Ottawa, Ontario K1A 0H8

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A copy of the letter must be sent to the Contracting Authority. Canada reserves the right to co-defend any action brought against Canada. All expenses incurred by Canada to co-defend such actions will be at Canada's expense. If Canada decides to co-defend any action brought against it, and Canada does not agree to a proposed settlement agreed to by the Contractor's insurer and the plaintiff(s) that would result in the settlement or dismissal of the action against Canada, then Canada will be responsible to the Contractor's insurer for any difference between the proposed settlement amount and the amount finally awarded or paid to the plaintiffs (inclusive of costs and interest) on behalf of Canada.

G5001C (2018-06-21)

## **C2 Commercial General Liability Insurance**

1. The Contractor must obtain Commercial General Liability Insurance, and maintain it in force throughout the duration of the Contract, in an amount usual for a contract of this nature, but for not less than \$2,000,000 per accident or occurrence and in the annual aggregate.
2. The Commercial General Liability policy must include the following:
  - a. Additional Insured: Canada is added as an additional insured, but only with respect to liability arising out of the Contractor's performance of the Contract. The interest of Canada should read as follows: Canada, as represented by Public Works and Government Services Canada.
  - b. Bodily Injury and Property Damage to third parties arising out of the operations of the Contractor.
  - c. Products and Completed Operations: Coverage for bodily injury or property damage arising out of goods or products manufactured, sold, handled, or distributed by the Contractor and/or arising out of operations that have been completed by the Contractor.
  - d. Personal Injury: While not limited to, the coverage must include Violation of Privacy, Libel and Slander, False Arrest, Detention or Imprisonment and Defamation of Character.
  - e. Cross Liability/Separation of Insureds: Without increasing the limit of liability, the policy must protect all insured parties to the full extent of coverage provided. Further, the policy must apply to each Insured in the same manner and to the same extent as if a separate policy had been issued to each.
  - f. Blanket Contractual Liability: The policy must, on a blanket basis or by specific reference to the Contract, extend to assumed liabilities with respect to contractual provisions.
  - g. Employees and, if applicable, Volunteers must be included as Additional Insured.
  - h. Employers' Liability (or confirmation that all employees are covered by Worker's compensation (WSIB) or similar program)
  - i. Broad Form Property Damage including Completed Operations: Expands the Property Damage coverage to include certain losses that would otherwise be excluded by the standard care, custody or control exclusion found in a standard policy.
  - j. Notice of Cancellation: The Contractor will provide the Contracting Authority thirty (30) days prior written notice of policy cancellation or any changes to the insurance policy.
  - k. If the policy is written on a claims-made basis, coverage must be in place for a period of at least 12 months after the completion or termination of the Contract.

- 
- i. Owners' or Contractors' Protective Liability: Covers the damages that the Contractor becomes legally obligated to pay arising out of the operations of a subcontractor.
  - q. Sudden and Accidental Pollution Liability (minimum 120 hours): To protect the Contractor for liabilities arising from damages caused by accidental pollution incidents.

G2001C (2018-06-21)

### **C3 Limitation of Contractor's Liability for Damages to Canada**

1. This section applies despite any other provision of the Contract and replaces the section of the general conditions entitled "Liability". Any reference in this section to damages caused by the Contractor also includes damages caused by its employees, as well as its subcontractors, agents, and representatives, and any of their employees.
2. Whether the claim is based in contract, tort, or another cause of action, the Contractor's liability for all damages suffered by Canada caused by the Contractor's performance of or failure to perform the Contract is limited to \$10,000,000.00. This limitation of the Contractor's liability does not apply to:
  - a. any infringement of intellectual property rights; or
  - b. any breach of warranty obligations.
3. Each Party agrees that it is fully liable for any damages that it causes to any third party in connection with the Contract, regardless of whether the third party makes its claim against Canada or the Contractor. If Canada is required, as a result of joint and several liability, to pay a third party in respect of damages caused by the Contractor, the Contractor must reimburse Canada for that amount.

N0001C (2008-05-12)

## **ANNEX "D"**

### **WARRANTY DEFECT CLAIM PROCEDURES AND FORMS**

#### **Warranty Procedures**

##### **1. Scope**

- a. The following are the procedures, which suit the particular requirements for warranty considerations for a vessel on completion of a refit.

##### **2. Definition**

There are a number of definitions of "warranty" most of which are intended to describe its force and effect in law. One such definition is offered as follows:

"A warranty is an agreement whereby the vendor's or manufacturer's responsibility for performance of its product is extended for a specific period of time beyond the date at which the title to the product passes to the buyer."

##### **3. Warranty Conditions**

- a. 2030 General Conditions - Higher Complexity - Goods are augmented by clauses incorporated into the subject Contract.
- b. The warranty periods may be stated in more than one part:
  - i. 90 days commencing from the day the PWGSC 1205 Acceptance Document is signed for workmanship provided by the contractor for the refit work specified;
  - ii. 365 days from the date of acceptance for the specified areas of painting;
  - iii. 365 days commencing from the day the PWGSC 1205 Acceptance Document is signed for parts and material provided by the contractor for the refit work specified;
  - iv. Any other specific warranty periods that may be required in the contract or offered by the Contractor.
- c. The foregoing does not cover the disposition of other deficiencies that will be directly related to Technical Authority problem areas of the following nature:
  - i. items becoming unserviceable that were not included in the refit specification;
  - ii. refit specifications or other related documentation requiring amendments or corrections to increase viability; and
  - iii. work performed that is directly related to the Technical Authority.

##### **4. Reporting Failures With Warranty Potential**

- a. The initial purpose of a report of a failure is to facilitate the decision as to whether or not to involve warranty and to generate action to effect repairs. Therefore in addition to identification, location data, etc. the report must contain details of the defect. Warranty decisions as a general rule are to be made locally and the administrative process is to be in accordance with procedures as indicated.
- b. These procedures are necessary as invoking a warranty does not simply mean that the warrantor will automatically proceed with repairs at his expense. A review of the defect may well result in a

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disclaimer of responsibility, therefore, it is imperative that during such a review the Department is directly represented by competent technical authority qualified to agree or disagree with the warrantor's assertions.

## 5. Procedures

- a. Immediately it becomes known to the Ship's Staff that an equipment/system is performing below accepted standards or has become defective, the procedures for the investigation and reporting are as follows:
  - i. The vessel advises the Technical Authority when a defect, which is considered to be directly associated the refit work, has occurred.
  - ii. On review of the Specification and the Acceptance Document, the Technical Authority in consort with Ship's Staff is to complete the Tombstone Data and section 1 of the Warranty Claim Form attached and forward the original to the Contractor for review with a copy to the PWGSC Contracting Authority. If the PWGSC Contracting or Inspection Authority is unable to support warranty action, the Defect Claim Form will be returned to the originator with a brief justification. (It is to be noted that in the latter instance PWGSC will inform the Contractor of its decision and no further action will be required of the Contractor.  
  
Warranty defect claims may be forwarded in hard copy, by fax or by e-mail whichever format is the most convenient.
  - iii. Assuming the Contractor accepts full responsibility for repair, the Contractor completes Section 2 and 3 of the Warranty Claim Form, returns it to the Inspection Authority who confirms corrective action has been completed, and who then distributes the form to the Technical Authority and the PWGSC Contracting Authority.
- b. In the event that the Contractor disputes the claim as a warranty defect, or agrees to share, the contractor is to complete Part 2 of the Warranty Claim Form with the appropriate information and forward it to the Contracting Authority who will distribute copies as necessary.
- c. When a warranty defect claim is disputed by the Contractor, the Technical Authority may arrange to correct the defect by in-house resources or by contracting the work out. All associated costs must be tracked and recorded as a possible charge against the contractor by PWGSC action. Material costs and man-hours expended in correcting the defect are to be recorded and entered in Section 5 of the warranty defect claim by the Technical Authority who will forward the warranty defect claim to the PWGSC Contracting Authority for action. Defective parts of equipment are to be retained pending settlement of claim.
- d. Defective equipment associated with potential warranty should not normally be dismantled until the contractor's representative has had the opportunity to observe the defect. The necessary work is to be undertaken through normal repair methods and costs must be segregated as a possible charge against a contractor by PWGSC action.

## 6. Liability

- a. Agreement between the Contracting Authority, Inspection Authority, Technical Authority and the Contractor will result in one of the following conditions:
  - I. The contractor accepts full responsibility for costs to repair or overhaul under the warranty provisions of the contract;
  - II. The Technical Authority accepts full responsibility for repair and overhaul of item concerned;  
or

- III. The Contractor and the Technical Authority agree to share responsibility for the costs to repair or overhaul the unserviceable item, in such cases the PWGSC Contracting Authority will negotiate the best possible sharing arrangement.
- b. In the event of a disagreement as in paragraph 5c, PWGSC will take necessary action with the contractor while the Technical Authority informs its Senior Management including pertinent data and recommendations.
- c. The total cost of processing warranty claims must include accommodation and travel costs of the contractor's employees as well as equipment/system down time and operational constraints. Accordingly, the cost to remediate the defect, in man-hours and material, will be discussed between the Contracting/Inspection Authorities and the Technical Authority to determine the best course of action.

#### **7. Alongside Period For Warranty Repairs and Checks**

If at all possible, an alongside period for the vessel is to be arranged just before the expiration of the 90 day warranty period. This alongside period is to provide time for warranty repair and check by the contractor.

Solicitation No. - N° de l'invitation  
T2012-210151/A  
Client Ref. No. - N° de réf. du client  
T2012-210151

Amd. No. - N° de la modif.  
File No. - N° du dossier  
HAL-1-87129

Buyer ID - Id de l'acheteur  
HAL202  
CCC No./N° CCC - FMS No./N° VME

**APPENDIX 1 TO ANNEX "D"**



Public Works and Government  
Services Canada

Travaux publics et Services  
gouvernementaux Canada

**Warranty Claim  
Réclamation De Garantie**

|   |  |                               |
|---|--|-------------------------------|
| Vessel Name – Nom de navire                                 | File No. – N° de dossier   | Contract No. - N ° de contrat |
| Customer Department – Ministère client                      | Warranty Claim Serial No.<br>Numéro de série de réclamation de garantie  |                               |
| Contractor – Entrepreneur                                   | Effect on Vessel Operations<br>Effet sur des opérations de navire<br><br>Critical    Degraded    Operational    Non-<br>operational<br><br>Critique    Dégradé    Opérationnel    Non-<br>opérationnel |                               |
| <b>1. Description of Complaint – Description de plainte</b> |  |                               |
|   |  |                               |
| Contact Information – l'information de contact              |  |                               |
| _____<br>Name – Nom   | _____<br>Tel. No. - N ° Tél  |                               |
| _____<br>Signature – Signature                              | _____<br>Date  |                               |

Solicitation No. - N° de l'invitation  
T2012-210151/A  
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T2012-210151

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File No. - N° du dossier  
HAL-1-87129

Buyer ID - Id de l'acheteur  
HAL202  
CCC No./N° CCC - FMS No./N° VME

**2. Contractor's Investigative Report – Le rapport investigateur de l'entrepreneur**

**3. Contractor's Corrective Action – La modalité de reprise de l'entrepreneur**

\_\_\_\_\_  
Contractor's Name and Signature – Nom et signature de l'entrepreneur  
reprise

\_\_\_\_\_  
Date of Corrective Action - Date de modalité de  
reprise

\_\_\_\_\_  
Client Name and Signature - Nom et signature de client

\_\_\_\_\_  
Date

**4. PWGSC Review of Warranty Claim Action – Examen d'action de réclamation de garantie par TPSGC**

\_\_\_\_\_  
Signature – Signature

\_\_\_\_\_  
Date

**5. Additional Information – Renseignements supplémentaires**



PWGSC-TPSGC

Solicitation No. - N° de l'invitation  
T2012-210151/A  
Client Ref. No. - N° de réf. du client  
T2012-210151

Amd. No. - N° de la modif.  
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HAL-1-87129

Buyer ID - Id de l'acheteur  
HAL202  
CCC No./N° CCC - FMS No./N° VME

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## **ANNEX "E" to PART 3 OF THE BID SOLICITATION**

### **ELECTRONIC PAYMENT INSTRUMENTS**

The Bidder accepts to be paid by any of the following Electronic Payment Instrument(s):

- VISA Acquisition Card;
- MasterCard Acquisition Card;
- Direct Deposit (Domestic and International);
- Electronic Data Interchange (EDI);
- Wire Transfer (International Only);

**ANNEX “F”**

**FINANCIAL BID PRESENTATION SHEET**

**Proposed Work Location:** CTMA Ferry (Traversier CTMA (CTMA Traversier-Croisières)  
70 Chem. du Débarcadère, Cap-aux-Meules, QC G4T 1S7

**1. Evaluation of Price**

|           |   |          |
|-----------|---|----------|
| <b>a)</b> | <p><b>Known Work</b><br/>For work stated in Annex “A” and associated drawings for a <b>FIRM PRICE</b> of:</p> <p><b>(All Travel costs must be included)</b></p>   | \$ _____ |
| <b>b)</b> | <p><b>Unscheduled Work – Regular Labour Rate</b><br/>Estimated labour hours at a firm Charge-out Labour Rate, including overhead and profit:<br/>200 person hours x \$ _____ per hour for a PRICE of:</p> | \$ _____ |
| <b>c)</b> | <p><b>Subcontractor Allowance - FSR Services (Lloyd’s Register)</b><br/>Allowance markup _____ % (max 10%) x \$5000.00 (estimate) for a PRICE of:</p>   | \$ _____ |
| <b>d)</b> | <p><b>Evaluation Price</b><br/><b>HST Excluded [ a + b ]:</b></p> <p style="text-align: right;"><b>For an EVALUATION PRICE of:</b></p>  | \$ _____ |

**2. Unscheduled Work**

**2.1 Price Breakdown:**

The Contractor must, upon request, provide a price breakdown for all unscheduled work, by specific activities with trades, person-hours, material, subcontracts and services.

**2.2 Pro-rated Prices:**

Hours and prices for unscheduled work will be based on comparable historical data applicable to similar work at the same facility, or will be determined by pro-rating the quoted work costs in the Contract when in similar areas of the vessel.

**2.3 Payment for Unscheduled Work:**

The Contractor will be paid for unscheduled work arising, as authorized by Canada. The authorized unscheduled work will be calculated as follows:

Number of hours (to be negotiated) x \$ \_\_\_\_\_, being the Contractor's firm hourly charge-out labour rate which includes overhead and profit, plus net laid-down cost of materials to which will be added a mark-up of 10 percent, plus Applicable Taxes. The firm hourly charge-out labour rate and the material mark-up will remain firm for the term of the Contract and any subsequent amendments. The 10% mark-up rate for materials will also apply to subcontracted costs.

**2.4 Overtime**

No overtime work will be compensated for under the Contract unless authorized in advance and in writing by the Contracting Authority. Any request for payment must be accompanied by a copy of the overtime

Solicitation No. - N° de l'invitation  
T2012-210151/A  
Client Ref. No. - N° de réf. du client  
T2012-210151

Amd. No. - N° de la modif.  
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HAL-1-87129

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authorization and a report containing such details as Canada may require with respect to the overtime work performed. Compensation for authorized overtime will be calculated by taking the average hourly direct labour rate premiums, plus certified fringe benefit additives, plus profit of 7 1/2 percent on labour premium and fringe benefits. These rates will remain firm for the duration of the Contract including all amendments and are subject to audit if deemed necessary by Canada



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**ANNEX "H" to PART 5 OF THE BID SOLICITATION**

**FEDERAL CONTRACTORS PROGRAM FOR EMPLOYMENT EQUITY – CERTIFICATION**

I, the Bidder, by submitting the present information to the Contracting Authority, certify that the information provided is true as of the date indicated below. The certifications provided to Canada are subject to verification at all times. I understand that Canada will declare a bid non-responsive, or will declare a contractor in default, if a certification is found to be untrue, whether during the bid evaluation period or during the contract period. Canada will have the right to ask for additional information to verify the Bidder's certifications. Failure to comply with any request or requirement imposed by Canada may render the bid non-responsive or constitute a default under the Contract.

For further information on the Federal Contractors Program for Employment Equity visit [Employment and Social Development Canada \(ESDC\) – Labour's](#) website.

Date: \_\_\_\_\_ (YYYY/MM/DD) (If left blank, the date will be deemed to be the bid solicitation closing date.)

Complete both A and B.

A. Check only one of the following:

- A1. The Bidder certifies having no work force in Canada.
- A2. The Bidder certifies being a public sector employer.
- A3. The Bidder certifies being a [federally regulated employer](#) being subject to the [Employment Equity Act](#).
- A4. The Bidder certifies having a combined work force in Canada of less than 100 permanent full-time and/or permanent part-time employees.

A5. The Bidder has a combined workforce in Canada of 100 or more employees; and

- A5.1. The Bidder certifies already having a valid and current [Agreement to Implement Employment Equity](#) (AIEE) in place with ESDC-Labour.
- OR**
- A5.2. The Bidder certifies having submitted the [Agreement to Implement Employment Equity \(LAB1168\)](#) to ESDC-Labour. As this is a condition to contract award, proceed to completing the form Agreement to Implement Employment Equity (LAB1168), duly signing it, and transmit it to ESDC-Labour.

B. Check only one of the following:

- B1. The Bidder is not a Joint Venture.

**OR**

- B2. The Bidder is a Joint venture and each member of the Joint Venture must provide the Contracting Authority with a completed annex Federal Contractors Program for Employment Equity - Certification. (Refer to the Joint Venture section of the Standard Instructions)

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**ANNEX “J” to PART 5 OF THE BID SOLICITATION**

**COVID-19 VACCINATION REQUIREMENT CERTIFICATION**

I, \_\_\_\_\_ (*first and last name*), as the representative of  
\_\_\_\_\_ (*name of business*) pursuant to  
\_\_\_\_\_ (*insert solicitation number*), warrant and certify that all  
personnel that \_\_\_\_\_ (*name of business*) will provide on the  
resulting Contract who access federal government workplaces where they may come into contact with  
public servants will be:

- (a) fully vaccinated against COVID-19 with Health Canada-approved COVID-19 vaccine(s); or
- (b) for personnel that are unable to be vaccinated due to a certified medical contraindication, religion or other prohibited grounds of discrimination under the *Canadian Human Rights Act*, subject to accommodation and mitigation measures that have been presented to and approved by Canada;

until such time that Canada indicates that the vaccination requirements of the COVID-19 Vaccination Policy for Supplier Personnel are no longer in effect.

I certify that all personnel provided by \_\_\_\_\_ (*name of business*) have been notified of the vaccination requirements of the Government of Canada's COVID-19 Vaccination Policy for Supplier Personnel, and that the \_\_\_\_\_ (*name of business*) has certified to their compliance with this requirement.

I certify that the information provided is true as of the date indicated below and will continue to be true for the duration of the Contract. I understand that the certifications provided to Canada are subject to verification at all times. I also understand that Canada will declare a contractor in default, if a certification is found to be untrue, whether made knowingly or unknowingly, during the bid or contract period. Canada reserves the right to ask for additional information to verify the certifications. Failure to comply with any request or requirement imposed by Canada will constitute a default under the Contract.

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Optional

For data purposes only, initial below if your business already has its own mandatory vaccination policy or requirements for employees in place. Initialing below **is not** a substitute for completing the mandatory certification above.

Initials: \_\_\_\_\_

Information you provide on this Certification Form and in accordance with the Government of Canada's COVID-19 Vaccination Policy for Supplier Personnel will be protected, used, stored and disclosed in accordance with the Privacy Act. Please note that you have a right to access and correct any information on your file, and you have a right to file a complaint with the Office of the Privacy Commissioner regarding the handling of your personal information. These rights also apply to all individuals who are deemed to be personnel for the purpose for the Contract and who require access to federal government workplaces where they may come into contact with public servants.

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**ANNEX "K"**

**MANDATORY TECHNICAL CRITERIA**

The bid must meet the mandatory technical criteria specified below. The bidder must provide the necessary documentation to demonstrate compliance with this requirement.

Bids that fail to meet the mandatory technical criteria will be declared non-responsive. Each mandatory technical criterion should be addressed separately. Bidders must complete the following checklist and include it in the bid submission package

**Mandatory Technical Criteria (MT)**

| <b>No.</b> | <b>Description of Criterion</b>  | <b>Cross Reference to Proposal</b> |
|------------|--|------------------------------------|
| <b>MT1</b> | The Bidder must demonstrate that they have sufficient resources required to complete the work in this statement of work.   |                                    |
| <b>MT2</b> | Bidder must have relevant project experience in installation work associated with marine electrical systems that has required Class certification. The Bidder must enclose two examples of electrical installation projects it has completed that also had Class certification per section 8 of the Statement of Work. |                                    |
| <b>MT3</b> | Bidder must demonstrate personnel are qualified and have experience to undertake and carry out the work outlined in the Statement of Work.   |                                    |



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# HEAT TRACE INSTALLATION SOW

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MADELEINE II

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PWGSC

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BY: BP

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CHECKED: TH

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APPROVED: BP

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DATE: 10/18/2021

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REVISION: 2

---

PROJECT#: 21075

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DOC #: 21075-100-SPC-040

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1111 Bedford Highway  
Halifax, NS  
Canada, B4A 1B9  
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Suite 304, 495 Water St.  
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Canada, A1E 6B5  
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*Revision Table*

| <b>Rev #</b> | <b>Date</b> | <b>Change Description</b>   | <b>By:</b> | <b>Checked By:</b> | <b>Approved by:</b> |
|--------------|-------------|-----------------------------|------------|--------------------|---------------------|
| 0            | 09/21/2021  | Initial Report              | BP         | TH                 | BP                  |
| 1            | 09/30/2021  | Revised Per TC Comments     | BP         | TH                 | BP                  |
| 2            | 10/18/2021  | Section on Insulation Added | BP         | TH                 | BP                  |
|              |             |                             |            |                    |                     |
|              |             |                             |            |                    |                     |

## TABLE OF CONTENTS

|    |  |  |    |
|----|--|--|----|
| 1  | PREAMBLE   | 1  | 1  |
|    | 1.1  | Background .....   | 1  |
|    | 1.2  | Vessel Particulars.....  | 1  |
|    | 1.3  | Scope .....  | 2  |
|    | 1.4  | Reference Documents .....  | 3  |
| 2  | REGULATORY REQUIREMENTS .....                                |  | 3  |
| 3  | Intentionally Blank .....                                    |  | 3  |
| 4  | TECHNICAL REQUIREMENTS.....                                  |  | 4  |
|    | 4.1  | General Requirements .....   | 4  |
|    | 4.2  | Material Supply .....  | 4  |
|    | 4.3  | Electrical Installation .....  | 8  |
|    | 4.4  | Insulation and Cladding Installation .....   | 15 |
|    | 4.5  | Steel and Structural Work.....   | 16 |
|    | 4.6  | Testing & Commissioning .....  | 17 |
|    | 4.7  | Additional Services Provided With Installation.....  | 17 |
| 5  | QUALITY ASSURANCE AND PROOF OF PERFORMANCE .....             |  | 18 |
| 6  | RESPONSIBILITIES OF CONTRACTOR / RESPONSIBILITIES OF TC..... |  | 18 |
| 7  | DELIVERABLES .....   |  | 19 |
| 8  | EXPERIENCE .....   |  | 19 |
| 9  | WORK PLAN  |  | 20 |
| 10 | BASIS OF PAYMENT .....                                       |  | 20 |
|    | Appendix A   | DECKS 3-5, HEAT TRACE CIRCUITS DATA TABLE FOR CIRCUITS SUPPLIED BY CENTRALISED HEAT TRACE CONTROLLER.....        | 21 |
|    | Appendix B   | DECKS 6-10, HEAT TRACE CIRCUITS DATA TABLE FOR CIRCUITS SUPPLIED BY LOCAL INDIVIDUAL HEAT TRACE CONTROLLERS..... | 24 |

## 1 PREAMBLE

### 1.1 BACKGROUND

The MV Madeleine II, originally named the Viking ADCC, was initially designed to operate year-round in the Baltic Sea. Construction began in December 2007 with the Keel being laid in May 2008 at the Spanish shipyard Astilleros de Sevilla. Delays and issues at the yard caused the order to be cancelled in early 2010. The partially completed hull remained at the yard until purchased in 2013 by another Spanish yard, Factorias Vulcan.

Trasmediterránea purchased the vessel in 2017 and the vessel was put into service, in the Mediterranean Sea. The vessel was purchased by Transport Canada in 2020 and is now operated by CTMA on year-round service from Souris, PEI to Cap-aux-Meules, PQ.

Where the final vessel construction and outfitting was finished for service in the Mediterranean Sea, rather than the Baltic Sea, freeze protection was not fitted in piping systems. There are several piping arrangements for fresh and/or seawater systems on the vessel which are in exterior areas or other areas such as the vehicle Decks whereby they could be subjected to freezing conditions in winter season. The arrangements of piping identified as requiring freeze protection include fire mains and hydrants outside the accommodations house and within the vessels vehicle Decks, freshwater service piping outside the accommodations house and the extensions of piping for these systems in unheated compartments.

### 1.2 VESSEL PARTICULARS

|                             |         |
|-----------------------------|---------|
| Length, O.A.                | 139.1 m |
| Length, B.P.                | 123.6 m |
| Length, W.L.                | 130.8 m |
| Breadth (Moulded)           | 22.00 m |
| Depth, Main Deck (Moulded)  | 8.2 m   |
| Depth, Upper Deck (Moulded) | 13.8 m  |
| Draft, Design               | 5.7 m   |
| Draft, Scantling            | 5.9 m   |

|                                   |  |
|-----------------------------------|--|
| Service Speed                     | 21.8 Knots   |
| Classification:                   | Passenger/Vehicle Ferry Ice Class 1A FS<br>IWS; LMC; UMS; NAV1; PCAC 2.2; ShipRight<br>SMC |
| Passengers, Maximum               | 1570   |
| Cars & Trailers: (Total capacity) | 1,985 Lane metre   |
| Main Deck 3 (Trailers or Cars)    | 772 lane metres  |
| pper Deck 5 (Cars)                | 654 lane metres  |
| Upper Deck 4 (Hoistable – Cars)   | 559 lane metres  |
| Ship Builder                      | Factorias Vulcano, Vigo, Spain   |
| Hull No.                          | 548  |
| Year Built                        | 2019   |
| Keel Laid                         | 06/05/2008   |
| IMO#                              | 9430105  |
| DWT                               | 2,350  |
| GRT                               | 15,875   |
| NRT                               | 5,893  |
| Propulsion                        | Twin screw CPP   |
| Main Engines                      | 2 x 10,000 kW  |
| Aux. Gen's                        | 3 x 1,080 kW   |
| Bow Thruster                      | 2 x 1,000 kW   |

### 1.3 SCOPE

The intent of this statement of work is to outline the technical requirements for the installation of an electrically sourced heat trace system for freeze protection of the exposed fire mains throughout the vehicle Decks and on the exposed piping at fire stations on the external areas of the upper Decks, along with specific sections of exposed freshwater system piping in the same areas. Installation Contractors receiving this statement of work are invited to bid for the supply, installation and commissioning of the heat trace systems described herein and within the referenced and attached documents. Please note the term "Contractor" is synonymous with the term "Bidder" in the context of this statement of work.

#### 1.4 REFERENCE DOCUMENTS

1. Factorias Vulcano ---: 813-001 Deck Wash and Fire-Fighting System
2. Allswater Drawing: 21075-850-EA-040 Heat Trace Circuit Arrangements
3. Decks 3-5, Heat Trace Circuits Data Table for Circuits Supplied by Centralised Heat Trace Controller (see Appendix A).
4. Decks 6-10, Heat Trace Circuits Data Table for Circuits Supplied by Centralised Heat Trace Controller (see Appendix B).
5. Allswater Drawing: 21075-850-EB-041 Heat Trace Control Panels Typical Schematics
6. Allswater Drawing: 21075-850-EB-001 Ship's Single Line Diagram – Main Network
7. Allswater Document: 21075-850-ED-042 Panel Schedules

## 2 REGULATORY REQUIREMENTS

The vessel is in Class with Lloyd's Register and therefore must comply with Lloyds Register's Rules and Regulations for the Classification of Ships.

For the installation of electrically sourced heat tracing equipment, the electrical installation shall be in accordance with, Part 6 Control, Electrical, Refrigeration and Fire of Lloyd's Register Rules and Regulations for the Classification of Ships. The installation of electrical equipment shall additionally follow marine best practices.

All electrical equipment used in control, alarm and safety systems is to be suitable for its intended purpose, and accordingly, whenever practicable, be selected from the List of Type Approved Products published by Lloyd's Register. Where not practical, or for equipment not normally subject to marine type approval such as small control panels or distribution panels, such equipment shall be certified or listed by a nationally recognized certifying authority such as CSA, ULC, Intertek or equivalent recognized certification body from the country of origin for equipment originating outside of Canada.

## 3 INTENTIONALLY BLANK

## 4 TECHNICAL REQUIREMENTS

### 4.1 GENERAL REQUIREMENTS

The Contractor shall supply, install, and commission an electrical heat trace system and associated components in accordance with the technical requirements outlined in this document and as further described within the documents attached and referenced herein.

The Contractor shall use the materials supplied by Transport Canada, and as referenced in section 4.2 below. The Contractor shall supply additional materials as required to complete the installation, in conformance with this specification and applicable regulations.

The Contractor shall perform installation services in accordance with sections 4.3, 4.4 and 4.5 and functional testing after installation as described in section 4.6.

### 4.2 MATERIAL SUPPLY

The Contractor shall use the Government Supplied Material, as outlined in the 4.2.1 below. The Contractor shall additionally supply all other materials required to complete the installation as per this specification, regulations, and good marine shipbuilding practice.

#### 4.2.1 GOVERNMENT SUPPLIED MATERIAL

Bulk material has been pre-purchased and is available for use by the Contractor in the installation.

| GOVERNMENT SUPPLIED MATERIALS |   |             |
|-------------------------------|---|-------------|
| ITEM                          | ITEM NAME                                       | QTY         |
| 1                             | Black Armoured Marine Cable 3C x 2.5 mm         | 765 metres  |
| 2                             | Heat Trace Cable (Thermon, BSX 8-2-OJ)          | 1525 metres |
| 3                             | TRICAB DV type cable 3C x 1.5 mm                | 2000 metres |
| 4                             | 1492-W4 IEC Terminal block                      | 200 each    |
| 5                             | OD2SC Stuffing Tubes M24235/18                  | 30 each     |
| 6                             | Single Entry Power Connection with Junction Box | 70 each     |
| 7                             | End Seal  | 100 each    |
| 8                             | Fibreglass Electrical Enclosure                 | 12 each     |
| 9                             | Steel Back Plate                                | 12 each     |
| 10                            | Glass Tape Roll                                 | 70 each     |
| 11                            | Aluminum Tape                                   | 25 each     |
| 12                            | Heat Trace Warning Labels                       | 200 each    |

#### 4.2.2 *CONTRACTOR SUPPLIED MATERIAL*

The Contractor shall supply all additional materials required to complete the installation and not otherwise included in the government furnished material list above. Material to be supplied shall include but is not limited to RTD temperature sensors, cable supports and ties, fasteners, and hardware for mounting of electrical enclosures, additional cables of like type to the government furnished cables, as well as the control and distribution panels as described below in sections 4.2.2.1 and 4.2.2.2 and the primary feeder cable and new breaker to supply power to the panel described in 4.2.2.1.

The Contractor shall supply all material necessary for the installation of insulation and cladding for the heat traced portion of the piping affected, as further described in part 4.2.2.4.

##### 4.2.2.1 CENTRALIZED HEAT TRACE CONTROL AND DISTRIBUTION PANEL

The Contractor shall supply and install one (1) centralized control and distribution panel for providing power and control to heat trace circuits throughout vehicle Decks 3 to 5. The centralized control and distribution panel shall be arranged for three phase, 230 Volt, 200-amp input power. Heat trace circuits shall be divided evenly across the three phases. The centralized control and distribution panel shall be procured and/or designed and fabricated by the Contractor. Wherever possible the Contractor shall provide commercial off-the shelf heat trace control panels with the built-in functionality required. The centralized control and distribution panel shall be supplied to meet the following minimum requirements:

- 17 + 1 spare (min) off 230 volts 15 amps, dual pole breakers.
- 17 + 1 spare (min) off 230 volts 15 amps, dual pole relay/ contactors.
- Per circuit temperature control (RTD) inputs.
- Per circuit ground-fault current monitoring causing alarm and tripping of control contactor/relay on ground fault current exceeding 30 mA.
- Per circuit current magnitude measurement, and alarm on high/low current.
- Alarm output to Vessel's alarm system.
- Programmable controller, with ability to control individual heat tracing circuits via on/off ambient sensing, pipe temperature sensing and ground fault conditions, and with alarm output to vessel's alarm system.
- Certification to CAN/CSA C22.2 NO. 14, by a nationally recognized certification body.
- NEMA 3R or 4X Enclosure suitable for bulkhead mounting.

Refer also to reference drawing 5 for typical wiring arrangement.

#### 4.2.2.2 SINGLE CIRCUIT CONTROL PANELS

The Contractor shall supply and install five (5) single circuit control panels for powering heat trace circuits on the external fire stations located on Decks 6 to Deck 10. The single circuit control panels shall accept single phase, ungrounded 230 Volt input protected by 16 Amp breakers. The Contractor shall provide commercial off-the shelf heat trace control panels with built-in functionality described below where possible. The single control panels shall be procured and/or designed and fabricated by the Contractor and shall include the minimum as follows:

- 230 volts 16 amps (or higher rated), dual pole relay/ contactor.
- Temperature control (RTD) input.
- Ground-fault current monitoring causing alarm and tripping of control contactor/relay on ground fault current exceeding 30 mA.
- Current magnitude measurement, and alarm on high/low current.
- Relay/Alarm output to Vessel's alarm system.
- Programable controller, with ability to control relay/contactor via on/off ambient sensing, and ground fault conditions, and with alarm output to vessel's alarm system.
- Certification to CAN/CSA C22.2 NO. 14, by a nationally recognized certification body.
- NEMA 3R or 4X Enclosure suitable for bulkhead mounting.

Refer also to reference drawing 5 for typical wiring arrangement.

#### 4.2.2.3 NEW BREAKER AND CABLE FOR CENTRALIZED HEAT TRACE CONTROL AND DISTRIBUTION PANEL

The new breaker for installation in the main 230 Volt switchboard shall be a Schneider NSX400N- 3 pole breaker or equivalent, with an adjustable trip unit STR23SE with long-time trip setting down to 0.4 In or 160 Amps. The breaker shall be fitted in the Main 230 Volt Switchboard replacing a NSX630N labelled as B44.

A new cable is required to be installed between the main 230-volt switchboard and new Centralized Heat Trace Control Panel which shall be suitable for 200 Amps three phase. The minimum cable size for a three-conductor cable shall be 95 mm<sup>2</sup>. Alternatively, three single core cables may be used for ease of installation, in which case the minimum size is 70 mm<sup>2</sup>.

The cable shall be marine type approved with a minimum insulation temperature rating of 90 degrees Celsius.

#### 4.2.2.4 INSULATION AND CLADDING

The Contractor shall supply all material necessary for the installation of piping insulation and cladding for the heat traced portion of the piping affected.

Piping insulation shall be supplied as pre-formed fiberglass or mineral stone wool hinged sections designed to meet ASTM C547, Mineral Fiber Pipe Insulation, and ASTM C585, Inner and Outer Diameters of Thermal Insulation for Nominal Sizes of Pipe and Tubing.

Insulation material shall be suitable for installation in a marine environment and be Non-combustible with low flame-spread properties.

The inner diameter of preformed insulation sections to be supplied shall be matched to the outer diameter of pipes for installation.

The minimum thickness of insulation shall be 50 mm (2 inches).

A complete cladding system shall be supplied to cover all insulation, to prevent mechanical damage and the penetration of moisture. Cladding shall be corrosion and salt water resistant aluminum with minimum thickness of 0.5 mm.

Cladding shall be fabricated from rolled sheet aluminum or supplied as preformed jackets from a pipe jacket system manufacturer. Cladding shall be installed in sufficient quantity and sizes to cover all insulated and heat traced piping. The contractor shall fabricate or supply prefabricated cladding sections for all straight pipe, bends, tees, fittings, and flanges to completely cover the insulated piping arrangement.

The contractor shall supply all screws, bands, fasteners, and sealing compound as required to complete the installation of insulation and cladding. Adhesives used for bonding insulation sections together or to metal surfaces shall not contain ketones or methylated hydrocarbon solvents and shall be supplied by the contractor as recommended by the insulation and cladding system manufacturers.

### 4.3 ELECTRICAL INSTALLATION

The Contractor shall replace the existing breaker B44 in the main 230 Volt Switchboard with a new 250 Amp frame breaker as described in section 4.2.2.3.

The Contractor shall install control panels in the locations described in this document and as shown in Appendix A, with exact final locations decided in consultation with the ship's owner's and operators. The installation of control panels shall include the supply and fabrication of any structural foundations to support the control panels.

The Contractor shall assemble and install power junction boxes for grouping of heat trace cables installed on multiple fire stations on the exterior Decks to be controlled from single circuit heat trace controllers.

The Contractor shall route power cables from ships existing electrical distribution system to the installed control panels and from the control panels and junction boxes to the heat trace power connection junction boxes installed on pipes to be heat traced. The Contractor shall use existing cable trays and penetrations wherever possible. Cables shall be fastened to cables trays using cable bands supplied by the Contractor. The Contractor shall install individual stuffing tube penetrations where required and single cable studs or hangers to complete cable routing.

The Contractor shall endeavour to keep the removal and opening of Deckhead and bulkhead panels to a minimum and make use existing cable runs and penetrations, wherever possible, to minimize the amount of hot work required for installation of new penetrations and new cable supports.

The Contractor shall install heat trace cabling, power connection boxes/splices and end seals on those pipes identified in Appendix A, see Ref. 3, and B, see Ref. 4. The heat trace shall be installed per the manufacturer's (Thermon) recommendations, in a single pass in straight line generally at the 8 o'clock or 4 o'clock position on the pipe. The heat trace shall be fastened with glass tape around the trace heater and pipe at intervals of 12" (30 cm) or less, keeping the trace heater in close contact with the pipe. The grouping together of pipes to be supplied by individual heat trace circuits shall be as described in section 4.3, and as shown in reference drawing 2.

#### 4.3.1 VEHICLE DECKS HEAT TRACE INSTALLATION

Heat tracing shall be installed on the fire mains piping systems throughout vehicle Decks 4 and 5, as well as in the specific locations listed below:

- Fire mains located on the fire locker on Deck 3.
- Fire mains located in void spaces at the aft of Deck 3 and 4.
- The new freshwater HPDE line extending straight from Deck 3 to 5 up the forward end of the casing and along the Deckhead on Deck 5.

All the exposed fire mains piping on vehicle Decks 4 and 5, as well as the fire mains piping in the fire locker on vehicle Deck 3 are to be fitted with Heat trace. The fire mains piping to be heat traced, shall be grouped together in circuits by adjacent and connected piping segments as shown in reference drawing 2. Reference Appendix A. provides an estimate of the length of piping per segments, total length of heat trace, number of power junction boxes and number of end seals for each circuit as laid out in reference drawing 2. The arrangement of circuits and grouping of piping present in the reference Appendix A and reference drawing 2 is such that each circuit can be supplied with a 15 Amp breaker. The Contractor shall track the actual length of heat trace cable installed on a per circuit basis to confirm final electrical loads, in a document to be delivered to the Technical Authority at the end of contract. Adjustments to the exact arrangement of circuits may be necessary during installation, and the Contractor must ensure any such adjustments will not result in any one circuit exceeding 80% of the circuit breaker rating protecting the circuit.

All heat trace circuits on vehicle Decks 3, 4 and 5 shall be supplied from the centralized control panel described in 4.2.2.1.

The centralized control panel is to be supplied and installed by the Contractor at a location on Deck 4 in the crew stairway or safety center in the area where water-tight doors and ballast control panels are located around frame 65. The exact location of the control panel shall be determined by the Contractor in consultation with the vessel owner representatives and vessel crew.

Input power to the control panel shall be from a new breaker installed in the main 230 Volt switchboard on Deck 2 in place of existing spare breaker B44. The Contractor shall supply and install the power cable between the existing Main 230 Volt Switchboard and the new centralized control and distribution panel. The Contractor shall route the cable up the main

vertical cable run in the stairway area to the location on Deck 4 where the centralized control panel is to be installed.

From the control panel, individual power cables shall be routed out to the vehicle areas through the existing multicable penetration on the port side around frame 63.

All circuits identified as circuits 5 thru 15 in Appendix A, which include the piping on Deck 4, along with the circuit in the fire locker on Deck 3 shall be controlled via an ambient sensor supplied and installed in the vehicle area of Deck 4. The ambient sensor shall be installed in the vehicle deck in an unobstructed location. Cabling to the ambient sensor shall be routed from the control panel to the sensor along existing cable trays where the cable can be maintained at least 50 mm from power cables otherwise it should be installed on a dedicated single cable run using cable studs or similar.

Circuits 3 and 4 which includes fire mains and fire stations inside the vehicle area on Deck 5 shall be controlled via an ambient sensor supplied and installed by the Contractor on Deck 5 in the vehicle area. Cabling to the ambient sensor shall be routed from the control panel to the sensor along existing cable trays where the cable can be maintained at least 50 mm from power cables otherwise it should be installed on a dedicated single cable run using cable studs or similar.

#### *4.3.2 EXTERNAL FIRE STATIONS*

For the external fire stations located outside the vehicle area on Deck 5, on the aft open deck area, a single circuit from the above-mentioned central controller on Deck 4 shall be used to for the heat trace in that area. A power cable from the centralized control panel shall be run in existing cable trays on Deck 4 to a central location beneath the aft deck, open deck area. A power junction box shall be installed on the underside of Deck 5 splitting the power feed to four parallel outputs to be routed to each of the four stations on the aft open deck. Power cables shall penetrate the deck in the area of the four stations using stuffing tubes. A separate ambient sensor shall be installed on the aft deck for controlling the switching of this circuit identified as circuit 2 in Appendix A and reference drawing 2. Cabling to the ambient sensor shall be routed from the control panel to the sensor along existing cable trays along a similar route as the power cable, where the cable can be maintained at least 50 mm from other power cables, otherwise it should be installed on a dedicated single cable run using cable studs or similar.

Similarly, the fire stations on the Deck 5 Foc'sle area shall be served by a dedicated circuit from the centralized control panel on Deck 4 referred to as circuit 1 in Appendix A and reference drawing 2. The power cable from the centralized control panel shall be run in existing cable trays on Deck 4 to a location beneath the deck open bow area. A power junction box shall be installed on the underside of Deck 5 splitting the power feed to four parallel outputs to be routed to each of the four stations on the open Bow area. Power cables shall penetrate the deck in the area of the four stations using stuffing tubes. A dedicated ambient sensor shall be installed on the open bow area for switching power to this circuit. Cabling to the ambient sensor shall be routed from the control panel to the sensor along existing cable trays along a similar route as the power cable, where the cable can be maintained at least 50 mm from other power cables, otherwise it should be installed on a dedicated single cable run using cable studs or similar.

For the remaining external fire stations located on Decks 6-10, stations shall be grouped together in five groups as described below and as summarized in the tables of Appendix B. Appendix B tables provide an estimate of the length of piping per fire station, total length of heat trace per station, number of power junction boxes and number of end seals for each group of fire stations as laid out in reference drawing 2. Each group of stations shall be supplied from a single circuit controller as described in 4.2.2.2. Each single circuit controller shall have an associated ambient sensor installed at the nearest external fire station being controlled. Cabling to the ambient sensors shall be routed from the control panels to the sensors along existing cable trays, along a similar route as the power cables, where the cables can be maintained at least 50 mm from other power cables, otherwise it should be installed on a dedicated single cable run using cable studs or similar.

#### 4.3.2.1 GROUP 1 EXTERNAL STATIONS

For Deck 6 external stations, a single circuit controller shall be supplied and installed in the vicinity of the local distribution panel LP 3.6.1 in the closet storage area at frame 38-40 CL assessable from the starboard corridor. Power shall be supplied from existing spare 16-amp breaker, L-3.6.1.12 in panel LP 3.6.1. The heat trace cables for all 6 fire stations on Deck 6 shall be supplied in parallel on the same power circuit via the one controller. A junction box shall be installed in the closet to split the power feed after the controller to distribute switched power to the six stations. Power cables shall be run along existing cable ways above the ceiling in the corridors and penetrate through the bulkheads in the vicinity of

the fire stations. Stuffing tubes are required for penetrations through the bulkheads in the areas near the fire stations.

#### 4.3.2.2 GROUP 2 EXTERNAL STATIONS

For the two Deck 7 external fire stations aft, a single circuit controller shall be installed in the vicinity of the local distribution panel 3.7.1 in the Tech Stores at frame 40 near centerline, with power provided from spare 16-amp breaker L-3.7.1.17 in that panel. A junction box shall be installed in the tech stores to split the power feed after the controller to provide power to the starboard and port side stations respectively. Additionally, the two aft most fire stations on Deck 8 shall be supplied with power from this junction box and controller along with freshwater piping outside the Kennel area on Deck 8. Power cables shall be run from the tech stores along existing cable ways above the ceiling and penetrate through the bulkheads in existing multi cable transits at frame 29 in the vicinity of the aft fire stations on port and starboard of Deck 7 respectively. Power cables for Deck 8 shall be passed through existing penetration from the tech stores to the kennel area and to the fire stations through existing multi cable transit penetrations.

#### 4.3.2.3 GROUP 3 EXTERNAL STATIONS

For the remaining 4 fire stations on Deck 7, located at frames 87 and 110 both port and starboard, a single circuit controller shall be provided and supplied by circuit L-1.6.2.13 IN panel LP 1.6.2 in the stores area at frames 80 to 83 on Deck 6. A junction box shall be installed in the area to split the power feed after the controller to allow switched power to be routed to the four different stations. Power cables shall be routed from this junction box, beneath Deck 6 along existing cableways then penetrate Deck 7 in locations at the four stations using stuffing tubes. Additionally, near the fire station at frame 87 portside, a small weather tight power junction box shall be supplied and installed which allows for parallel connection of a power cable to provide power to heat trace installed on the piping lines beneath Deck 8 serving the station on Deck 8 at frame 89 portside. The heat trace itself on this piping will also need to pass through a stuffing tube installed next to the pipe where it penetrates through Deck 8 to continue the heat tracing circuit above the deck up to the fire station valve.

#### 4.3.2.4 GROUP 4 EXTERNAL STATIONS

For the two external fire stations on Deck 8, at frame 56 port and starboard along with two fire stations on Deck 9 around frame 56 port and starboard a single circuit controller shall be provided and supplied power by spare circuit L-3.8.1.12 on panel LP 3.8.1 in the crew laundry

at frames 58 to 62 on Deck 8. A junction box will be required in the area of the controller and existing distribution panel to allow parallel power cables to be routed to the four different stations. Power cables shall be run along existing cable ways above the ceiling and penetrate through the bulkheads for Deck 8 stations and through the deck for Deck 9 stations in the vicinity of the fire stations. Stuffing tubes are required to be installed for penetrations in the areas near the fire stations.

#### 4.3.2.5 GROUP 5 EXTERNAL STATIONS

For the remaining three fire stations on Deck 8 forward, two stations on Deck 9 forward and two fire stations on Deck 10, a single circuit controller shall be provided and supplied by spare circuit L-1.8.4.9 on panel LP 1.8.4 in the crew pantry area at frame 87 on Deck 8. An additional junction box is required in vicinity of the existing distribution panel and new controller. From the junction box, power cables shall be run along existing cable ways above the ceiling on Deck 8 and penetrate through the bulkheads for the stations on Deck 8 in the vicinity of the stations. A cable shall be run from the junction box through the officer's mess to the aft portside corridor to an existing penetration from Deck 8 to Deck 9 at about frame 76. The cable shall be routed through the fire locker area on Deck 9 and through a penetration in Deck 10 to the fire station at about frame 75 port side. An additional power cable shall be routed from the junction box through the existing penetration in the stairway to the ceiling above Deck 9 and then forward to a location in the AC Room where another junction box shall be installed to split the power to be routed to the two forward stations on Deck 9 and the one forward station on Deck 10. From that junction box power cables shall be routed along existing cableways above the ceiling of Deck 9 to new stuffing tubes to be installed in the bulkheads in the vicinity of the two forward fire stations on Deck 9 and to new stuffing tube installed in the Deckhead through Deck 10 in the vicinity of the forward station on Deck 10.

#### 4.3.3 NEW FRESH WATER LINES

The new freshwater lines that are installed outside of the accommodations on the port side around frame 75, extends from below Deck 3 through the vehicle compartment on Deck 3, 4 and 5 where it penetrates Deck 6 and runs vertically along the outboard bulkheads of Decks 6, 7 and 8 until it re-enters the accommodation through Deck 8 bulkhead. The entire line should be heat traced with a continuous heating circuit along the external portion described, and a separate continuous circuit along the internal portion on vehicle Deck 3, 4 and 5. These two circuits shall be supplied from the centralized control panel on Deck 4. The two circuits

are designated as circuits 16 and circuit 17 in the table of reference Appendix A. This piping is not shown on reference drawing 2, as that drawing is showing fire mains piping only.

The internal piping that is designated as circuit 16 in reference Appendix A originates below Deck 3 at frame 95 on the forward bulkhead of the central casing and travels up the forward bulkhead from Deck 3 to Deck 5 where it penetrates Deck 5 and continues up the forward bulkhead on Deckhead to the Deckhead beneath Deck 6. The pipe then is routed along the port side of the central casing to approximately frame 75 where it crosses to the outboard bulkhead and penetrates Deck 6 to continue externally as described in the paragraph above. The entire portion from Deck 3 to the Deckhead of Deck 6 shall be heat traced as one circuit and supplied from the centralised heat trace controller on Deck 4. A power cable shall be routed from the control panel through the existing multi-cable transit, to cable trays on the port side on the Deckhead of Deck 4 and routed to the forward end of the central casing where a heat trace power supply junction box should be installed on the pipe near the penetration through Deck 5. Two heat trace cables shall be spliced in the power supply junction box with one trace cable running down the pipe to Deck 3 and one passed through a stuffing tube through Deck 5 and installed on the pipe throughout Deck 5. This pipe is HPDE pipe and therefore the heat trace shall be covered in a continuous aluminum tape. The circuit shall include two pipe sensor temperature devices installed on the pipe one just below the penetration on Deck 4 to Deck 5 and one on the portion of pipe on Deck 5 near the penetration to Deck 6. Circuit 16 shall be programmed for pipe sensing in the heat trace controller, with the pipe sensor temperature device wired back to the controller, following a similar route as the power cable.

For the external sections of piping a power cable shall be routed from the central control and distribution panel on Deck 4 up to Deck 5 on existing vertical cable trays then through a new stuffing tube out to the vehicle bay area portside. The cable shall be routed across the Deckhead of Deck 5 to the location at approximately frame 75 port side where the new Fresh water pipe penetrates the Deck. A stuffing tube shall be installed through the Deck next to the pipe for the power cable to reach external piping. The power cable should then be terminated to the heat trace power supply junction box installed on the beginning of the external portion of the pipe on Deck 6. The heat trace cable should be routed along the pipe and pass-through stuffing tubes adjacent to the pipe at each of Decks 7, and 8 near the pipe to the end of the external section of pipe where it enters the accommodation house through the bulkhead on Deck 8. The circuit shall include a pipe sensor temperature device installed

on the pipe, just above the penetration on Deck 6. Circuit 16 shall be programmed for control via pipe sensing in the heat trace controller, with the pipe sensor temperature device wired back to the controller, following a similar route as the power cable.

#### 4.4 INSULATION AND CLADDING INSTALLATION

All piping that is heat traced per section 4.3 above shall be covered in insulation to prevent heat loss and the insulation shall be completely cladded to prevent mechanical damage and moisture absorption. Insulation shall be fitted after heat trace has been installed and electrically tested as described in section 4.6. Insulation shall be installed on all sections of piping that has had heat trace installed, including all fittings, bends, tees, and flanges. Each piping line should be insulated separately; a common insulation cover should not enclose more than one line.

Pre-formed insulation sections shall be installed and secured to the pipes per the manufacturer's recommendations. Insulation and accessory materials shall be applied only to surfaces that are clean, dry, and frost-free. Metal surfaces under insulation must be undamaged and properly coated before insulation can be applied. Any damaged or uncoated areas of piping found during the installation process shall be brought to the attention of the Technical Authority.

Insulation must be protected against damage and kept dry in storage prior to application such that it is clean and dry during application. On outdoor or weather exposed locations the installation of insulation shall not be performed during periods of inclement weather. During installation, at the end of the working day, any insulation that has been installed and not cladded, in weather exposed areas, shall be temporarily sealed to prevent the ingress of water. During installation, the contractor shall cover all openings in vessels, towers, equipment, flooring, etc. that could cause dripping of water or liquids or other contaminations onto insulating materials.

Sections of insulation shall fit closely on the surface to be insulated and to adjacent sections. Any unavoidable gaps should be filled with insulation of the same material to give a continuous uniform insulation surface. Where sections of pre-formed insulation pieces are butted together, the ends shall be sealed with an appropriate sealant per the manufacturer's recommendations. Sealing and adhesive materials shall be used within manufacturer's published shelf life.

All insulated pipes shall be weatherproofed with a metal jacket made with corrosion and salt water resistant aluminum sheets of minimum thickness 0.5 mm, machine rolled to fit the circumference of the pipe and insulation. The jacket design shall have longitudinal laps where sealant is to be applied and shall be closed and fastened with self tapping screws or rivets. The sealant shall be applied in strip form wherever possible.

Where a piping tee or branch or bend exists, pre-formed fittings from a cladding jacket system manufacturer may be used, where available in the appropriate sizes, or fittings may be fabricated by from rolled aluminum and cut in mitered sections and bent to form, with sections sealed together to give a weatherproof fit. The metal cladding on bends shall be of interlocking to straight sections and be self-supporting.

All joints between sections of cladding shall be sealed with overlapping laps with a continuous band of sealant applied to maintain weatherproof integrity. Joints in metallic cladding overlaps shall not be fully closed prior to application of sealant.

Where heat trace power connection junction boxes and end seals are installed on pipes the cladding is to be fit over the devices and sealed to the stems of the junction boxes or end seals with sealing mastic to maintain weatherproof fit of cladding system. The head of junction box is required to be disconnected and temporarily removed to fit the cladding with a drilled hole tightly over the stem portion of the junction box.

Cladding shall not be allowed to contact dissimilar metals due to the possibility of electrolytic attack. The contractor shall supply and install galvanic isolation components or sealants between aluminum cladding and the vessel's steel structure.

After installation of cladding, red colored flow arrows like those on the existing fire main pipes are to be installed on the outside of the cladding. Heat trace warning labels shall be fixed to the outside of the cladding, with at least one label per branch of piping and at intervals of at least 10 meters along long lengths of pipe.

#### 4.5 STEEL AND STRUCTURAL WORK

Structural or steelwork expected under this installation contract is minimal, however cutting and welding of steel is anticipated to be required for the installation of cable penetrations or stuffing tubes through steel bulkheads and decks. Additionally, the centralised Heat trace

control and distribution panel is likely to require a support foundation for mounting to the steel bulkheads. The Contractor shall include in their bid provisions for a qualified welder to install penetrations and create a foundation for the centralised Heat trace control and distribution panel, and any other welding or structural work expected to be required by the Contractor. All welding shall be completed to CWB (Canadian Welding Bureau) latest standards.

The Contractor is to ensure that a fire watch service is always present when burning and welding is in progress, and for a period of 60 minutes after the termination of work each day. The fire watch is to be maintained through coffee & meal breaks. The Contractor shall take all the necessary actions to ensure that the Vessels are properly protected from a fire resulting from any work carried out by the Contractor, or its Sub-Contractors, at any location.

#### 4.6 TESTING & COMMISSIONING

The installation Contractor shall perform testing and commissioning of the system after installation in accordance with manufacturer's (Thermon) recommendations. Tests shall include an insulation resistance (IR) test for all heater cables as well as power cables supplying heater cables. Tests shall be performed multiple times during installation, once prior to completing the power connections, on heat trace cables alone, again after completing power connections, and again after completing the installation of insulation and cladding systems prior to energizing the circuits. The insulation resistance of any trace heater cable shall not be less than 20 M $\Omega$ . The heat trace controller shall be functionally tested according to the manufacturer's recommendations.

#### 4.7 ADDITIONAL SERVICES PROVIDED WITH INSTALLATION

The Installation Contractor shall additionally include, as part of the service offered, the following items:

1. Delivery of all materials and equipment to and from the vessel, including proper storage and protection from the elements.
2. Preparation of surface and removal of coating adjacent to areas to be cut for installation of cable penetrations or for installation of cable support hangers.
3. Protection of adjacent areas to any area of work, especially in way of architectural finished components, piping, and electrical cabling. Any damages to adjacent areas to be rectified by the Contractor.
4. Recoating in accordance with the original coating specification for the vessel, all new steel or surfaces exposed or disturbed because of work contained in this specification.

5. Installation and removal of any staging required for completion of the work.
6. Supply of personal fall protection and restraint equipment as required.
7. Maintenance of work area including removal and disposal of debris, during and after undertaking of work.
8. Quality assurance in accordance with Section 5 of this specification.

## **5 QUALITY ASSURANCE AND PROOF OF PERFORMANCE**

The Contractor shall provide proof of performance with respect to all work. As a minimum this shall include copies of all inspection points identified within the Contractor's proposed Quality Plan and those identified by heat trace (Thermon) manufacturer's suggested inspection points. Proof of performance shall also include all inspection check points specifically detailed below:

1. Inspection of material and their installation.
2. Inspection of welding and fastening for equipment and equipment supports.
3. Verification of general workmanship including packing of transits securing of cables to cable trays.

## **6 RESPONSIBILITIES OF CONTRACTOR / RESPONSIBILITIES OF TC**

The following is a list of responsibilities for Contractor and TC:

- The Contractor shall be required to actively participate in the overall management of all activities related to the installation and will be directly responsible for the effective supervision and coordination of the efforts of its personnel to minimize the effort required by TC and CTMA staff.
- The Contractor shall be responsible for all work produced under the contract, including completeness, accuracy and adherence to all relevant safety & environmental regulations, rules and good practices including those in section 2 of this document.
- The Contractor shall be responsible for obtaining and maintaining any hot work certificates that are required to complete the installation work.
- The Contractor shall be responsible for arranging and funding all onsite inspection and approval for the requirements of Lloyd's Registry. All approved plans as well as all associated approval documentation shall be provided to TC at completion of the contract.
- The Contractor shall be responsible to ensure that cabling or cable or pipe penetrations of watertight/fire bulkheads is to be completed such that it complies with all applicable TCMS and Lloyd's standards and regulations for this class of vessel.

- With respect to Project Management, the Contractor shall provide a schedule and Gantt chart (or similar) for the planned work period and maintain the chart as any alterations to the schedule are required. The Contractor shall be responsible for organizing meetings (or conference calls) and must maintain summary minutes as well as history of all action items and submit it to the Technical Authority.
- The Contractor personnel must make all necessary preparations to actively participate in any meeting convened by the Technical Authority.
- All travel-related costs will be borne by the Contractor and included in the bid price.
- The Contractor is responsible for deciding if insurance coverage is necessary to fulfill its obligation under the Contract and to ensure compliance with any applicable law. Any insurance acquired or maintained by the Contractor is at its own expense and for its own benefit and protection. It does not release the Contractor or reduce its liability under the Contract.
- TC support to Contractor: To aid the Contractor in the provision of the required services, the following information materials and assistance will be provided if available and deemed appropriate by the Technical Authority:
- All required and available documents and drawings related to the "Madeleine II" including those references in section 1 of this document.

## 7 DELIVERABLES

The following deliverables are expected to be provided by the Contractor:

- Record of Work, a report on the general tasks undertaken to perform the services required as part of this installation work. The record of work shall include the quality inspection checklists and documentation referred in section 5 of this specification. The Record of Work will be submitted in a format acceptable to the Technical Authority. The Record of Work is to be attached to the Contractor's invoice.
- The Contractor shall provide a document listing the exact lengths of heat trace installed per heat trace circuit. This document shall be submitted with Contractor's Invoice.
- Vendor Furnished Documentation including but not limited to certificates and manuals for equipment and material supplied by the Contractor.

## 8 EXPERIENCE

The Contractor's professional experience, expertise and qualifications are the key to a successful outcome. As such, the company shall have previous experience in the installation of Electrical systems on Class Approved Vessels. The Contractor must have a minimum of two examples of

Electrical installations on Class Approved vessels of comparable size. Descriptions of the work must be included in the bid proposal with verifiable references. Demonstrated experience specifically with the installation of heat trace systems, although not mandatory will be considered favourably.

## **9 WORK PLAN**

The Contractor's professional experience and expertise are to be used to develop a work plan of sufficient detail to provide a clear indication of the time and schedule required to undertake the installation. The proposed work plan must be developed and submitted with the bid submission. The work plan must identify the team members with accompanying resumes/qualifications. Additionally, the expected lead times of key material to be supplied by the Contractor shall be included in the schedule.

## **10 BASIS OF PAYMENT**

The Basis of Payment for this contract will be fixed price including materials and travel expenses.

Appendix A      **DECKS 3-5, HEAT TRACE CIRCUITS DATA TABLE FOR  
CIRCUITS SUPPLIED BY CENTRALISED HEAT TRACE CONTROLLER**

(Next 4 Pages)

| CIRCUIT | DECK | FRAME REF. | PIPE SPOOL No. | LOCATION   | Overall Length of Exposed Pipe | Pipe Size (DN) | Estimated Heat Trace Cable (m) | Estimated Power (W) | Estimated Power/ Splice Junction Box | Estimated End Seals | Power Junction Box | Estimated length of Power Cable | Suggested Cable Size | NOTES  |  |
|---------|------|------------|----------------|--|--------------------------------|----------------|--------------------------------|---------------------|--------------------------------------|---------------------|--------------------|---------------------------------|----------------------|--|--|
| 1       | 5    | 138-S      | CI-81          | Foc'sle - Stbd side O/B at corner of bulkwork and house                    | 0.9                            | 65             |                                |                     |                                      |                     |                    | 20                              | 3CX1.5               |  |  |
|         | 5    | 141-S      | CI-80          | Foc'sle - Stbd side I/B between vent trunks                                | 1                              | 65             | 8                              | 216                 | 4                                    | 4                   | 1                  | 15                              | 3CX1.5               | Connected to Fire Station 54W  |  |
|         | 5    | 141-P      | CI-83          | Foc'sle - Port side O/B at corner of bulkwork and house                    | 0.9                            | 65             |                                |                     |                                      |                     |                    | 100                             | 3CX1.5               | Includes length of cable to Power Junction box Connected to Fire Station 53W                             |  |
|         | 5    | 145-P      | CI-82          | Foc'sle - Port side I/B between vent trunks                                | 1.3                            | 65             |                                |                     |                                      |                     |                    | 15                              | 3CX1.5               | International Shore Connection   |  |
| 2       | 5    | 5-P        | CI-99          | Poop Deck - Port side O/B - beside rail and between hatchways              | 1                              | 65             |                                |                     |                                      |                     |                    | 20                              | 3CX2.5               | International Shore Connection   |  |
|         | 5    | 5-S        | CI-01          | Poop Deck - Stbd side O/B - beside rail and between fairleads              | 1                              | 65             | 30                             | 810                 | 4                                    | 4                   | 1                  | 25                              | 3CX2.5               | International Shore Connection   |  |
|         | 5    | 11-P       | CI-23          | Poop Deck - Port side of aft bulkhead                                      | 9                              | 65             |                                |                     |                                      |                     |                    | 80                              | 3CX2.5               | Connected to Fire Station 53W<br>Includes length of cable to Power Junction Box on underside of deck 5   |  |
|         | 5    | 11-S       | CI-202         | Poop Deck - Stbd side of aft bulkhead                                      | 7.5                            | 65             |                                |                     |                                      |                     |                    | 30                              | 3CX2.5               | Connected to Fire Station 54W  |  |
|         | 5    | 31-40 S    | CI-66          | Stbd side I/B at aft end of central casing.                                | 10.2                           | 65             |                                |                     |                                      |                     |                    |                                 |                      |  |  |
|         | 5    | 40-47 S    | CI-48          | Stbd side - Approx. 1 m O/B of central casing. branch source of CI-64      | 7.5                            | 80             |                                |                     |                                      |                     |                    |                                 |                      |  |  |
| 3       | 5    | 47-52 S    | CI-215         | Stbd side - Approx. 4 m O/B of central casing.                             | 7.9                            | 65             |                                |                     |                                      |                     |                    |                                 |                      |  |  |
|         | 5    | 47-58 S    | CI-64          | Stbd side - Approx. 1 m O/B of central casing.                             | 10.9                           | 65             | 71                             | 1917                | 6                                    | 6                   | 1                  | 35                              | 3CX2.5               | Length of Power Cable Includes cable form Controller on deck 4 to Power Junction Box installed on deck 5 |  |
|         | 5    | 95-S       | CI-211         | Stbd side O/B - opposite fwd end of aft central casing                     | 3.4                            | 65             |                                |                     |                                      |                     |                    | 30                              | 3CX2.5               | Connected to Fire Station 64W  |  |
|         | 5    | 121-126 S  | CI-77          | Stbd side O/B - branch source of CI-209                                    | 9.2                            | 125            |                                |                     |                                      |                     |                    | 70                              | 3CX2.5               | Connected to Fire Station 65W  |  |
|         | 5    | 121-S      | CI-209         | Stbd side O/B - opposite 55W   | 4.6                            | 65             |                                |                     |                                      |                     |                    |                                 |                      |  |  |
|         | 5    | 42-44 P    | CI-63          | Port side - Transverse from central casing. branch source of CI-24 & CI-26 | 10.1                           | 100            |                                |                     |                                      |                     |                    |                                 |                      |  |  |
| 4       | 5    | 42-49 P    | CI-24          | Port side - Approx. 1.8 m O/B of central casing.                           | 7.5                            | 65             |                                |                     |                                      |                     |                    | 30                              | 3CX2.5               | Connected to Fire Station 58W  |  |
|         | 5    | 44-52 P    | CI-26          | Port side - Approx. 5 m O/B of central casing.                             | 10.5                           | 65             |                                |                     |                                      |                     |                    |                                 |                      |  |  |
|         | 5    | 67-P       | CI-50          | Port side O/B - opposite aft end of fwd central casing                     | 6.6                            | 125            |                                |                     |                                      |                     |                    | 20                              | 3CX2.5               | Length of Power Cable Includes cable form Controller on deck 4 to Power Junction Box installed on deck 5 |  |
|         | 5    | 92-P       | CI-212         | Port side O/B - opposite fwd end of aft central casing                     | 4.9                            | 65             | 78                             | 2106                | 8                                    | 8                   | 1                  | 5                               | 3CX2.5               | Connected to Fire Station 56W Power Supply from Heat Trace Junction box on CI-51                         |  |
|         | 5    | 95-P       | CI-51          | Port side - Transverse - opposite fwd end of fwd central casing            | 15.6                           | 125            |                                |                     |                                      |                     |                    | 45                              | 3CX2.5               | Power Supply from Heat Trace Junction box on Pipe 210 (Station 55W)                                      |  |
|         | 5    | 116-P      | CI-72          | Port side O/B  | 2.5                            | 125            |                                |                     |                                      |                     |                    | 5                               | 3CX2.5               | Connected to Fire Station 55W  |  |
|         | 5    | 121-P      | CI-210         | Port side O/B - aft at corner with stairwell casing                        | 4.3                            | 65             |                                |                     |                                      |                     |                    | 70                              | 3CX2.5               | Connected to Fire Station 55W  |  |
|         |      |            |                |  |                                |                |                                |                     |                                      |                     |                    |                                 |                      |  |  |

HEAT TRACE INSTALLATION SOW

MADELEINE II

| CIRCUIT | DECK | FRAME REF. | PIPE SPOOL No. | LOCATION  | Overall Length of Exposed Pipe | Pipe Size (DN) | Estimated Heat Trace Cable (m) | Estimated Power (W) | Estimated Power/Splice Junction Box | Estimated End Seals | Power Junction Box | Estimated length of Power Cable | Suggested Cable Size | NOTES   |                      |
|---------|------|------------|----------------|---|--------------------------------|----------------|--------------------------------|---------------------|-------------------------------------|---------------------|--------------------|---------------------------------|----------------------|---|----------------------|
| 5       | 4    | 61-71 S    | CI-37          | Stbd - /B - central casing - Dk 4 deckhead              | 9.8                            | 80             |                                |                     |                                     |                     |                    |                                 |                      |   |                      |
|         | 4    | 71-S       | CI-204         | Stbd - /B - central casing - Dk 4 deckhead              | 1.75                           | 65             |                                |                     |                                     |                     |                    |                                 |                      |   |                      |
|         | 4    | 71-73 S    | CI-206         | Stbd - /B - central casing - Dk 4 deckhead              | 4.1                            | 65             |                                |                     |                                     |                     |                    |                                 |                      |   |                      |
|         | 4    | 71-116 S   | CI-38          | From Penetration in /B frame 71 to CI-49                | 20                             | 125            | 57.8                           | 1560.6              | 4                                   | 5                   |                    | 5                               | 3CX2.5               | Connected to Fire Station 73W<br>Power should be split on Heat Trace JB on this pipe to feed Heat Trace JB where pipes CI-206, CI-204 Tee.<br>Connected to Fire Station 70W |                      |
| 6       | 4    | 84-86 S    | CI-47          | Stbd - Transverse - Dk 4 deckhead                       | 3.42                           | 65             |                                |                     |                                     |                     |                    |                                 |                      |   |                      |
|         | 4    | 87-S       | CI-49          | Stbd - /B - Dk 4 deckhead. b/w CI-38 and central casing | 5.55                           | 65             |                                |                     |                                     |                     |                    |                                 |                      |   |                      |
|         | 4    | 87-116 S   | CI-38          | Stbd - O/B - Dk 4 deckhead                              | 21                             | 125            |                                |                     |                                     |                     |                    |                                 |                      | From CI-47 Forward, AFT portion on circuit 10 to reduce total length of circuit 11.   |                      |
|         | 4    | 94-S       | CI-211         | Stbd - O/B - Dk 4 deckhead.                             | 2.8                            | 65             | 46                             | 1242                | 5                                   | 5                   |                    | 60                              | 3CX2.5               | Connected to Fire Station 71W<br>Includes vertical length b/w DK 3/4  |                      |
| 7       | 4    | 109-S      | CI-68          | Stbd - O/B - Dk 4 deckhead.                             | 3.5                            | 65             |                                |                     |                                     |                     |                    |                                 |                      |   |                      |
|         | 4    | 116-118 S  | CI-45          | Stbd - O/B - Dk 4 deckhead.                             | 9.2                            | 100            |                                |                     |                                     |                     |                    |                                 |                      |   |                      |
|         | 4    | 130-141    | CI-69          | Port - /B - Dk 4 deckhead                               | 8.8                            | 150            |                                |                     |                                     |                     |                    |                                 |                      | From CI-50 to CI-210  |                      |
|         | 4    | 136 S      | CI-48          | Port /B to Stbd O/B - Transverse                        | 8.8                            | 65             |                                |                     |                                     |                     |                    |                                 |                      | Spool b/w CI-69 & Fire Station 83W (Dk 3).  |                      |
|         | 4    | 134-P      | CI-71          | Port - Transverse - Dk 4 deckhead                       | 4.1                            | 65             |                                |                     |                                     |                     |                    |                                 |                      | Connected to Fire Station 75W (Dk 3)  |                      |
|         | 4    | 142-P      | CI-83          | Port O/B - Transverse - Dk 4 deckhead                   | 1.85                           | 65             |                                |                     |                                     |                     |                    |                                 |                      | feed to Fire Station 53W & int'l shore conn. (Dk 5)   |                      |
|         | 4    | 143-P      | CI-26          | Port O/B - Transverse - Dk 4 deckhead                   | 1.35                           | 65             |                                |                     |                                     |                     |                    |                                 |                      |   |                      |
|         | 4    | 145-S      | CI-78          | Port /B to Stbd O/B - Transverse                        | 8.22                           | 80             | 70                             | 1890                | 7                                   | 7                   |                    |                                 | 90                   | 3CX2.5  | branches off CI-78a. |
|         | 4    | 141-145 S  | CI-78          | Stbd O/B - Dk 4 deckhead                                | 3.56                           | 65             |                                |                     |                                     |                     |                    |                                 |                      |   |                      |
|         | 4    | 143-145 S  | CI-79          | Stbd O/B - Dk 4 deckhead                                | 5.24                           | 65             |                                |                     |                                     |                     |                    |                                 |                      |   |                      |
| 8       | 4    | 145-146 S  | CI-80          | Stbd O/B - Dk 4 deckhead                                | 1.52                           | 50             |                                |                     |                                     |                     |                    |                                 |                      |   |                      |
|         | 4    | 147-P      | CI-82          | Port O/B - Transverse - Dk 4 deckhead                   | 2.14                           | 80             |                                |                     |                                     |                     |                    |                                 |                      | To International Shore Connection on Bow  |                      |
|         | 4    | 115-133    | CI-69          | Port - /B - Dk 4 deckhead                               | 16                             | 150            |                                |                     |                                     |                     |                    |                                 |                      | From CI-72 to CI-77   |                      |
|         | 4    | 115-P      | CI-72          | Port O/B - Transverse - Dk 4 deckhead                   | 8.55                           | 125            |                                |                     |                                     |                     |                    |                                 |                      |   |                      |
| 9       | 4    | 118-121 P  | CI-210         | Port O/B - Transverse - Dk 4 deckhead                   | 9.9                            | 65             | 70                             | 1890                | 4                                   | 4                   |                    | 70                              | 3CX2.5               |   |                      |
|         | 4    | 125-133 S  | CI-77          | Port /B to Stbd O/B - Transverse & Aft                  | 20.1                           | 125            |                                |                     |                                     |                     |                    |                                 |                      |   |                      |
|         | 4    | 86-115     | CI-69          | Port - /B, Dk 4 deckhead                                | 23                             | 150            |                                |                     |                                     |                     |                    |                                 |                      | From CI-72 to CI-77   |                      |
|         | 4    | 92-P       | CI-212         | Port O/B - Transverse - Dk 4 deckhead                   | 8.7                            | 65             |                                |                     |                                     |                     |                    |                                 |                      |   |                      |
| 9       | 4    | 95-P       | CI-51          | Port O/B - Transverse - Dk 4 deckhead                   | 8.1                            | 125            | 67                             | 1809                | 4                                   | 5                   |                    | 50                              | 3CX2.5               | Connection b/w CI-05 & Fire Station 66W.  |                      |
|         | 4    | 110-P      | CI-69          | Port O/B - Transverse - Dk 4 deckhead                   | 8.35                           | 65             |                                |                     |                                     |                     |                    |                                 |                      |   |                      |

| CIRCUIT | DECK | FRAME REF. | PIPE SPOOL No. | LOCATION   | Overall Length of Exposed Pipe | Pipe Size (DN) | Estimated Heat Trace Cable (m) | Estimated Power (W) | Estimated Power/Splice Junction Box | Estimated End Seals | Power Junction Box | Estimated length of Power Cable | Suggested Cable Size | NOTES   |  |
|---------|------|------------|----------------|--|--------------------------------|----------------|--------------------------------|---------------------|-------------------------------------|---------------------|--------------------|---------------------------------|----------------------|---|--|
| 10      | 4    | 70-P       | CI-50          | Port O/B - Transverse - Dk 4 deckhead                    | 9.6                            | 125            |                                |                     |                                     |                     |                    |                                 |                      |   |  |
|         | 4    | 71-92      | CI-05          | Port - /B - Dk 4 deckhead                                | 12                             | 200            |                                |                     |                                     |                     |                    |                                 |                      | From CI-50 to Reducer and CI-50                         |  |
|         | 4    | 72-P       | CI-38          | Port - /B - Dk 4 deckhead. b/w CI-05 and central casing  | 3.95                           | 65             |                                |                     |                                     |                     |                    |                                 |                      | Connection b/w CI-05 & Fire Station 74W.                |  |
|         | 4    | 71-P       | CI-08          | Port - /B - Dk 4 deckhead. b/w CI-05 and central casing  | 3.85                           | 150            | 67                             | 1809                | 5                                   | 6                   |                    | 25                              | 3CX2.5               |   |  |
|         | 4    | 71-P       | CI-205         | Port - /B - Dk 4 deckhead. b/w CI-05 and central casing  | 3.85                           | 65             |                                |                     |                                     |                     |                    |                                 |                      |   |  |
|         | 4    | 71-P       | CI-03          | Port - /B - Dk 4 deckhead. b/w CI-05 and central casing  | 3.85                           | 150            |                                |                     |                                     |                     |                    |                                 |                      |   |  |
|         | 4    | 86-P       | CI-50          | Port O/B - Transverse - Dk 4 deckhead                    | 8                              | 65             |                                |                     |                                     |                     |                    |                                 |                      |   | Connection b/w CI-05 & Fire Station 67W. |
|         |      |            |                |  |                                |                |                                |                     |                                     |                     |                    |                                 |                      |   |  |
| 11      | 4    | 27-62      | CI-05          | Port - /B - Dk 4 deckhead                                | 25                             | 200            |                                |                     |                                     |                     |                    |                                 |                      | From CI-46 to CI-07                                     |  |
|         | 4    | 41 - P     | CI-62          | Port - /B - Dk 4 deckhead. b/w CI-05 and central casing  | 3.9                            | 150            |                                |                     |                                     |                     |                    |                                 |                      |   |  |
|         | 4    | 42 - P     | CI-05          | Port - /B - Dk 4 deckhead. b/w CI-05 and central casing  | 3.9                            | 150            |                                |                     |                                     |                     |                    |                                 |                      |   |  |
|         | 4    | 50 P       | CI-01          | Port - /B - Dk 4 deckhead. b/w CI-05 and central casing  | 5.55                           | 150            | 60                             | 1620                | 5                                   | 5                   |                    | 30                              | 3CX2.5               |   |  |
|         | 4    | 62-P       | CI-02          | Port - /B - Dk 4 deckhead. b/w CI-05 and central casing  | 3.85                           | 150            |                                |                     |                                     |                     |                    |                                 |                      |   |  |
|         | 4    | 62-P       | CI-07          | Port - /B - Dk 4 deckhead. b/w CI-05 and central casing  | 3.85                           | 125            |                                |                     |                                     |                     |                    |                                 |                      |   |  |
|         |      |            |                |  |                                |                |                                |                     |                                     |                     |                    |                                 |                      |   |  |
| 12      | 4    | 11-41 P    | CI-11          | Port - Dk 4 deckhead.                                    | 35                             | 150            |                                |                     |                                     |                     |                    |                                 |                      | Longitudinal length approx. 5 m O/B from central casing |  |
|         | 4    | 21-22 S    | CI-06          | Stbd - Transverse - Dk 4 deckhead                        | 13                             | 65             | 77                             | 2079                | 3                                   | 3                   |                    | 65                              | 3CX2.5               |   |  |
|         | 4    | 7-12 P     | CI-14          | Port - O/B - Aft Vent Room                               | 8                              | 80             |                                |                     |                                     |                     |                    |                                 |                      | Continuation of CI-11 through vent space                |  |
|         | 4    | 12-19 P    | CI-12          | Port - O/B - Dk 4 deckhead                               | 5.7                            | 65             |                                |                     |                                     |                     |                    |                                 |                      | Connection to Fire Station 68W.                         |  |
|         |      |            |                |  |                                |                |                                |                     |                                     |                     |                    |                                 |                      |   |  |
| 13      | 4    | 15-S       | CI-44          | Stbd - Transverse and into Stbd O/B Void - Dk 4 deckhead | 11.7                           | 65             |                                |                     |                                     |                     |                    |                                 |                      |   |  |
|         | 4    | 15-P       | CI-214         | Port - /B - Dk 4 deckhead.                               | 0.65                           | 65             |                                |                     |                                     |                     |                    |                                 |                      |   |  |
|         | 4    | 15-42      | CI-05          | Port - /B - Dk 4 deckhead From CI-09 to CI-05            | 26                             | 200            | 66                             | 1782                | 5                                   | 5                   |                    | 60                              | 3CX2.5               |   |  |
|         | 4    | 15-P       | CI-09          | Port - Transverse - Dk 4 deckhead                        | 7                              | 65             |                                |                     |                                     |                     |                    |                                 |                      |   |  |
|         | 4    | 25-27      | CI-08          | Central - transverse - Dk 4 deckhead                     | 7                              | 80             |                                |                     |                                     |                     |                    |                                 |                      |   |  |
|         | 4    | 21-27      | CI-46          | Central - transverse - Dk 4 deckhead                     | 10.3                           | 65             |                                |                     |                                     |                     |                    |                                 |                      | Connected to Fire Station 72W                           |  |
|         |      |            |                |  |                                |                |                                |                     |                                     |                     |                    |                                 |                      |   |  |

HEAT TRACE INSTALLATION SOW

MADELEINE II

| CIRCUIT | DECK | FRAME REF. | PIPE SPOOL No. | LOCATION  | Overall Length of Exposed Pipe                        | Pipe Size (DN) | Estimated Heat Trace Cable (m) | Estimated Power (W) | Estimated Power/Splice Junction Box | Estimated End Seals | Power Junction Box | Estimated length of Power Cable | Suggested Cable Size | NOTES  |         |  |
|---------|------|------------|----------------|---|---|----------------|--------------------------------|---------------------|-------------------------------------|---------------------|--------------------|---------------------------------|----------------------|--|---------|--|
| 14      | 4    | 5-5        | CI-01          | Stbd - O/B - Vent Rm  | 1.7   | 65             |                                |                     |                                     |                     |                    |                                 |                      | this line feeds to Int'l shore connection on Poop dk. (DK 5)<br><br>this line Feeds to Fire Station 79W (DK 3)<br><br>Access from Hatch Through Deck 5 Frame 6 Port<br><br>Access from Hatch Through Deck 5 Frame 6 Port<br><br><br>Connection to Fire Station 59W (DK 5).<br>Connection to Fire Station 59W (DK 5). |         |  |
|         | 4    | 4-5 S      | CI-28          | Stbd - O/B - Vent Rm  | 1.2   | 65             |                                |                     |                                     |                     |                    |                                 |                      |  |         |  |
|         | 4    | 5-5        | CI-99          | Port - O/B - Storage  | 1.7   | 65             |                                |                     |                                     |                     |                    |                                 |                      |  |         |  |
|         | 4    | 4-5 S      | CI-27          | Port - O/B - Storage Area                                       | 1.2   | 65             |                                |                     |                                     |                     |                    |                                 |                      |  |         |  |
|         | 4    | 5-P/S      | CI-02          | Transverse - Dk 4 deckhead                                      | 16  | 100            | 68                             | 1836                | 7                                   | 7                   |                    | 75                              | 3 Cx2.5              |  |         |  |
|         | 4    | 11-P       | CI-23          | OFF CI-02 Main Line At frame 11 - Dk 4 deckhead                 | 1   | 65             |                                |                     |                                     |                     |                    |                                 |                      |  |         |  |
|         | 4    | 4-11 S     | CI-202         | FWD OFF CI-02-STB Dk 4 deckhead                                 | 4   | 65             |                                |                     |                                     |                     |                    |                                 |                      |  |         |  |
|         | 4    | 5-12 S     | CI-02          | Main Line from Transverse CI-02 to Reducer Port - Dk 4 deckhead | 6.8   | 100            |                                |                     |                                     |                     |                    |                                 |                      |  |         |  |
|         | 4    | 12-S       | CI-21          | Stbd - Transverse - Dk 4 deckhead                               | 11.8  | 65             |                                |                     |                                     |                     |                    |                                 |                      |  |         |  |
|         | 15   | 3          | 25-CENTRAL     | CI-08   | Central - aft end of aft central casing - Fire Locker | 4.65           | 80                             | 12                  | 324                                 | 1                   | 2                  |                                 | 60                   |  | 3 Cx1.5 |  |
|         |      | 3          | 25-CENTRAL     | CI-22   | Central - aft end of aft central casing - Fire Locker | 3              | 65                             |                     |                                     |                     |                    |                                 |                      |  |         |  |
| 16      | 5    | 75-95 P    | N/A            | Port Overhead - Dk 5 deckhead                                   | 28  | 50             | 30                             | 810                 | 1                                   | 1                   |                    | 5                               | 3 Cx2.5              | HPDE PIPE REQUIRES CONTINUOUS ALUMINIUM TAPE OVER HEAT TRACE   |         |  |
|         | 6    | 75-P       | N/A            | Outside Deck 6 by Doorways at frame 75                          | 3   | 50             |                                |                     |                                     |                     |                    |                                 |                      |  |         |  |
|         | 7    | 75-P       | N/A            | Outside Deck 6 by Doorways at frame 75                          | 3   | 50             | 15                             | 405                 | 3                                   | 3                   |                    | 15                              | 3 Cx1.5              |  |         |  |
| 17      | 8    | 75-P       | N/A            | Outside Deck 6 by Doorways at frame 75                          | 3   | 50             |                                |                     |                                     |                     |                    |                                 |                      |  |         |  |

Appendix B      **DECKS 6-10, HEAT TRACE CIRCUITS DATA TABLE FOR  
CIRCUITS SUPPLIED BY LOCAL INDIVIDUAL HEAT TRACE CONTROLLERS**

(Next 2 Pages

| CIRCUIT GROUPING | DECK | FRAME REF. | OLD FIRE STATION No. | NEW FIRE STATION No. | LOCATION  | OVERALL LENGTH OF EXPOSED PIPE | PIPE SIZE | Estimated Heat Trace Cable (m) | Estimated Power (W) | Estimated Power/Splice Junction Box | Estimated End Seals | Stuffing Tube | POWER SUPPLY PANEL | CIRCUIT     | BREAKER SIZE | POWER CABLE PENETRATION LOCATION | Power Junction Box | Estimated Length of Power Cable | Suggested Minimum Cable Size | NOTES  |  |
|------------------|------|------------|----------------------|----------------------|---|--------------------------------|-----------|--------------------------------|---------------------|-------------------------------------|---------------------|---------------|--------------------|-------------|--------------|----------------------------------|--------------------|---------------------------------|------------------------------|--|--|
| GROUP 1          | 6    | 16-P       | F06.01               | 45W                  | Port side O/B - Pool area at corner of stairwell casing             | 1.08                           | 65        | 2.1                            | 57                  | 1                                   | 1                   | 1             |                    |             |              | Bkhd                             |                    | 50                              | 3C x 1.5                     |  |  |
|                  | 6    | 16-S       | F06.02               | 46W                  | Stbd side O/B - Pool area at corner of stairwell casing             | 1.09                           | 65        | 2.1                            | 57                  | 1                                   | 1                   | 1             |                    |             |              | Bkhd                             |                    | 40                              | 3C x 1.5                     |  |  |
|                  | 6    | 53-P       | F06.03               | 43W                  | Port side boat deck /B at bulkhead - approx. 2 m fwd of aft door to | 1.1                            | 65        | 2.1                            | 57                  | 1                                   | 1                   | 1             |                    |             |              | Bkhd                             | 1                  | 65                              | 3C x 1.5                     |  |  |
|                  | 6    | 53-S       | F06.05               | 48W                  | Stbd side boat deck /B at bulkhead - approx. 2 m fwd of aft door to | 1.09                           | 65        | 2.1                            | 57                  | 1                                   | 1                   | 1             |                    | LP 3.6.1    | L- 3.6.1.12  | 16                               | Bkhd               |                                 | 25                           | 3C x 1.5   |  |
|                  | 6    | 67-P       | F06.04               | 42W                  | Port side boat deck /B at bulkhead - approx. 2 m fwd of aft door to | 1.08                           | 65        | 2.1                            | 57                  | 1                                   | 1                   | 0             |                    |             |              | Bkhd                             |                    | 75                              | 3C x 1.5                     |  |  |
|                  | 6    | 67-S       | F06.06               | 49W                  | Stbd side boat deck /B at bulkhead - approx. 2 m AFT of aft door to | 0.95                           | 65        | 2                              | 54                  | 1                                   | 1                   | 0             |                    |             |              | Bkhd                             |                    | 50                              | 3C x 1.5                     |  |  |
| GROUP 2          | 7    | 29-P       | F07.01               | 27W                  | Port side /B on Aft bulkhead - beside door to port companionway     | 2.7                            | 65        | 5                              | 135                 | 1                                   | 1                   | 0             |                    |             |              | Bkhd                             |                    | 15                              | 3C x 1.5                     |  |  |
|                  | 7    | 29-S       | F07.02               | 28W                  | Stbd side /B on Aft bulkhead - beside door to stbd companionway     | 4.35                           | 65        | 6.6                            | 178                 | 1                                   | 1                   | 0             |                    |             |              | Bkhd                             | 2                  | 12                              | 3C x 1.5                     |  |  |
|                  | 8    | 37-P       | F08.01               | 10W                  | Port side /B - beside door to Kennel                                | 1.1                            | 65        | 2.7                            | 73                  | 1                                   | 1                   | 0             | LP 3.7.1           | L- 3.7.1.7  | 16           | Bkhd                             |                    | 15                              | 3C x 1.5                     | Power Supply from Heat Trace Junction Box on 10W           |  |
|                  | 8    | 37-P       | FRESH WATER LINES    |                      | Port side /B - beside door to Kennel                                | 11.5                           | 50        | 17.4                           | 470                 | 1                                   | 1                   | 0             |                    |             |              |                                  |                    | 2                               | 3C X 2.5                     |  |  |
|                  | 8    | 37-S       | F08.05?              | 11W                  | Stbd side /B - Aft end of house at Kennel                           | 0.93                           | 65        | 2.4                            | 65                  | 1                                   | 1                   | 0             |                    |             |              | Bkhd                             |                    | 20                              | 3C x 1.5                     |  |  |
| GROUP 3          | 7    | 87-P       | F07.03               | 25W                  | Port side /B - bulkhead at aft end of FRC                           | 0.95                           | 65        | 2.6                            | 70                  | 1                                   | 1                   | 1             |                    |             |              | Deck                             |                    | 100                             | 3C x 1.5                     |  |  |
|                  | 7    | 87-S       | F07.05?              | 32W                  | Stbd side O/B - at rail aft of rescue boat.                         | 1.2                            | 65        | 2.8                            | 76                  | 1                                   | 1                   | 1             |                    |             |              | Deck                             |                    | 12                              | 3C x 1.5                     |  |  |
|                  | 7    | 110-P      | F07.04               | 24W                  | Port side /B - bulkhead at approx. 5 m aft of ladder to deck 08     | 1.13                           | 65        | 2.7                            | 73                  | 1                                   | 1                   | 1             | LP 1.6.2           | L- 1.6.2.13 | 16           | Deck                             | 2                  | 65                              | 3C x 1.5                     |  |  |
|                  | 7    | 110-S      | F07.06?              | 33W                  | Stbd side O/B - at rail FWD of rescue boat.                         | 1.1                            | 65        | 2.7                            | 73                  | 1                                   | 1                   | 1             |                    |             |              | Deck                             |                    | 45                              | 3C x 1.5                     |  |  |
|                  | 8    | 89-P       | F08.03?              | 8W                   | Port side O/B - at 45 rails aft of FRC davit                        | 2.9                            | 65        | 4.5                            | 122                 | 1                                   | 1                   | 1             |                    |             |              | Deck                             |                    | 5                               | 3C x 1.5                     | Power Supply from Heat Trace Junction Box on 32W on Deck 7 |  |
|                  |      |            |                      |                      |   |                                |           |                                |                     |                                     |                     |               |                    |             |              |                                  |                    |                                 |                              |  |  |

| CIRCUIT GROUPING | DECK | FRAME REF. | OLD FIRE STATION No. | NEW FIRE STATION No. | LOCATION  | OVERALL LENGTH OF EXPOSED PIPE | PIPE SIZE | Estimated Heat Trace Cable (m) | Estimated Power (W) | Estimated Power/Splice Junction Box | Estimated End Seals | Stuffing Tube | POWER SUPPLY PANEL | CIRCUIT     | BREAKER SIZE | POWER CABLE PENETRATION LOCATION | Power Junction Box | Estimated Length of Power Cable | Suggested Minimum Cable Size | NOTES  |  |  |
|------------------|------|------------|----------------------|----------------------|---|--------------------------------|-----------|--------------------------------|---------------------|-------------------------------------|---------------------|---------------|--------------------|-------------|--------------|----------------------------------|--------------------|---------------------------------|------------------------------|--|--|--|
| GROUP 4          | 8    | 56-P       | F08.02?              | 9W                   | Port side I/B - bulkhead between 2nd/3rd windows from aft   | 1.26                           | 65        | 2.9                            | 78                  | 1                                   | 1                   | 1             |                    |             |              | Bkhd                             |                    | 35                              | 3C x 1.5                     |  |  |  |
|                  | 8    | 56-S       | F08.06?              | 12W                  | Stbd side I/B - bulkhead between 2nd/3rd windows from aft   | 1.2                            | 65        | 2.8                            | 76                  | 1                                   | 1                   | 1             | LP 3.8.1           | L- 3.8.1.12 | 16           | Bkhd                             | 1                  | 12                              | 3C x 1.5                     |  |  |  |
|                  | 9    | 56-P       | F09.01?              | 5W                   | Port side I/B - below fwd end of funnel                     | 1                              | 65        | 2.6                            | 70                  | 1                                   | 1                   | 1             |                    |             |              | Deck                             |                    | 40                              | 3C x 1.5                     |  |  |  |
|                  | 9    | 56-S       | F09.03?              | 6W                   | Stbd side I/B - below fwd end of funnel                     | 0.9                            | 65        | 2.5                            | 68                  | 1                                   | 1                   | 1             |                    |             |              | Deck                             |                    | 15                              | 3C x 1.5                     |  |  |  |
| GROUP 5          | 8    | 83-S       | F08.07?              | 13W                  | Stbd side I/B - bulkhead aft of stair to deck 07            | 0.52                           | 65        | 2.3                            | 62                  | 1                                   | 1                   | 1             |                    |             |              | Bkhd                             |                    | 15                              | 3C x 1.5                     |  |  |  |
|                  | 8    | 114-P      | F08.04?              | 7W                   | Port side I/B - bulkhead aft of stairs down to deck 07      | 0.69                           | 65        | 2.5                            | 68                  | 1                                   | 1                   | 1             |                    |             |              | Bkhd                             |                    | 45                              | 3C x 1.5                     |  |  |  |
|                  | 8    | 114-S      | F08.08               | 14W                  | Stbd side I/B - bulkhead aft of stairs down to deck 08      | 0.5                            | 65        | 2.3                            | 62                  | 1                                   | 1                   | 1             |                    |             |              | Bkhd                             |                    | 45                              | 3C x 1.5                     |  |  |  |
|                  | 9    | 112-P      | F09.02?              | 3W                   | Port side I/B - below aft end of main mast                  | 1.15                           | 65        | 3                              | 81                  | 1                                   | 1                   | 1             | LP 1.8.4           | L- 1.8.4.9  | 16           | Bkhd                             | 2                  | 50                              | 3C x 1.5                     | Includes length from Deck 8 to Junction box on Deck 9    |  |  |
|                  | 9    | 118-S      | F09.04?              | 4W                   | Stbd side I/B - below base of main mast                     | 0.8                            | 65        | 2.6                            | 70                  | 1                                   | 1                   | 1             |                    |             |              | Bkhd                             |                    | 8                               | 3C x 1.5                     | Includes length from Deck 9 junction box to Fire station |  |  |
|                  | 10   | 75-P       | F10.01?              | 1W                   | Port side O/B at rail - approx. 3 m aft of magnetic compass | 1.2                            | 65        | 3                              | 81                  | 1                                   | 1                   | 1             |                    |             |              | Deck                             |                    | 25                              | 3C x 1.5                     |  |  |  |
|                  | 10   | 108-S      | F10.2?               | 2W                   | Stbd side O/B at rail - approx. 1 m fwd of satellite dome   | 1.25                           | 65        | 3.1                            | 84                  | 1                                   | 1                   | 1             |                    |             |              | Deck                             |                    | 5                               | 3C x 1.5                     |  |  |  |
|                  |      |            |                      |                      |   |                                |           |                                |                     |                                     |                     |               |                    |             |              |                                  |                    |                                 |                              |  |  |  |
|                  |      |            |                      |                      |   |                                |           |                                |                     |                                     |                     |               |                    |             |              |                                  |                    |                                 |                              |  |  |  |
|                  |      |            |                      |                      |   |                                |           |                                |                     |                                     |                     |               |                    |             |              |                                  |                    |                                 |                              |  |  |  |