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**LETTER OF INTEREST**  
**LETTRE D'INTÉRÊT**

Comments - Commentaires

<b>Title - Sujet</b> RFI FOR CH147 DM	
<b>Solicitation No. - N° de l'invitation</b> W8476-165457/A	<b>Date</b> 2015-12-21
<b>Client Reference No. - N° de référence du client</b> W8476-165457	<b>GETS Ref. No. - N° de réf. de SEAG</b> PW-\$\$HL-632-68687
<b>File No. - N° de dossier</b> hl632.W8476-165457	<b>CCC No./N° CCC - FMS No./N° VME</b>
<b>Solicitation Closes - L'invitation prend fin</b> <b>at - à 02:00 PM</b> <b>on - le 2016-01-29</b>	
<b>Time Zone</b> Fuseau horaire Eastern Standard Time EST	
<b>F.O.B. - F.A.B.</b> <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> J.L. LeGrow	<b>Buyer Id - Id de l'acheteur</b> hl632
<b>Telephone No. - N° de téléphone</b> (873) 469-3353 ( )	<b>FAX No. - N° de FAX</b> (819) 956-5227
<b>Destination - of Goods, Services, and Construction:</b> <b>Destination - des biens, services et construction:</b> DEPARTMENT OF NATIONAL DEFENCE 101 COLONEL BY DR. Mr. Prakash Tadvalkar OTTAWA Ontario K1A0K2 Canada	

Instructions: See Herein

Instructions: Voir aux présentes

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Item Article	Description	Dest. Code Dest.	Inv. Code Fact.	Qty Qté	U. of I. U. de D.	Unit Price/Prix unitaire FOB/FAM	Destination	Plant/Usine	Delivery Req. Livraison Req.	Del. Offered Liv. offerte
1	RFI FOR CH147 DM	W8476	W8476	1	Each	\$	XXXXXXXXXXXX		See Herein	

## Request for Information

### Introduction

The Department of National Defence (DND) is performing industry benchmarking to find information concerning a CH 147F Chinook Tactical Aviation Light Weight Rapid Deployable Maintenance Facility (DMF) for Canadian Armed Forces (CAF) operations.

The DMF will enable maintenance (aircraft inspection and major repairs) activities.

The requirement is for two DMF's. The DMF will be deployed for periods running between one and three months.

### Required DMF performance characteristics

The DMF will be required to operate over a range of climatic zones from Equator to Arctic Circle and exposed to rugged military usage. It is expected to accommodate & enable the maintenance of one CH147 aircraft, with the following external dimensions:

- Total length: 99 feet (30.2 m)
- Overall fuselage length: 52 feet 1 inch (15.9 m)
- Fuselage width: 15 feet 9 inches (4.8 m)
- Rotor disc diameter: 60 feet (18.3 m)
- Back rotor maximum height: 18 feet 8 inches (5.7 m)
- Maximum CH147 weight that can be towed: 50,000 lbs (22,700 kg)
- Max load on the most loaded wheel on the soft / hard floor / ground inside the shelter 11,000 lbs (4,990 kg) (approximately 200 psi pressure on the floor)

Specifically, the DMF is expected to have the following performance characteristics:

- **Code Compliance:** The DMF to be designed in accordance with the National Building Code of Canada, the National Fire Code of Canada, and the Canadian Standards Association
- **Critical internal dimensions:**
  - Minimum inside dimensions (clearance): 120 ft. x 105 ft. x 40 ft. (L x W x H).
  - Minimum inside height (clearance): 40 feet (12.19m) measured from the top of the floor.
  - Minimum dimensions of the gate (clearance): 75ft x 22.5ft (W x H)
  - See Attachments #1 and #2 for the longitudinal and transversal minimum clearance requirements

- **Climatic Conditions:**

- Operate in climate from -46C to +51C.
- Withstand Strong wind conditions (130 km/h sustained & gust with the gate closed and 80 km/h sustained & gust with the gate open), heavy snow loads, rain and moisture resistant, and fire resistant.

- **Requirements:**

- Opening at one end to tow a CH147F with blades unfolded into the facility. The opening must be able to be closed once aircraft is within the facility.
- Inlet ports and air distribution system for heaters or air coolers.
- A separate air circulation ventilation system from any heaters or air coolers systems in case the heater or air coolers are not deployed.
- The facility must be able to accommodate an aircraft under cover within 18 hours of work over a two day period from beginning of setup. A further 18 hours of work over a two day period would be allowed to finish installation with lighting, doors, heaters setup, etc. Installation must be performed without the use of heavy equipment (i.e. forklift, zoom boom, ladders, Bobcat<sup>®</sup>). Installation will be performed by a crew of eight persons.
- 6 personnel doors of 72 inch width each.
- Anchoring capability in concrete, asphalt & in minimally prepared rough ground conditions with compact soil, sand, rock, and ice. Ground can be sloped as much as 1 degree both directions longitudinal and transversal.
- Optional: a corridor with a separate shelter to be used as lunch room/office space for 30 people to be attached to one of the 72 inch door.
- Expected life usage (storage and deployed) is 20 years.

- **Systems:**

- **Electrical:** Separate LED lighting and outlet electrical packages with individual isolated electrical generators to run the each electrical system. The largest sized generator to be used is 25 kW.
- **Protection:** Lightning and grounding protection systems outside of the shelter and two grounding points inside.
- **Heating, Cooling & Ventilation:** Diesel heaters and cooling conditioning with sufficient total output required to maintain a working temperature in all possible working environments (the heating system and cooling system must be 2 separate systems). The heating requirement is for a 50C temperature difference between minimum outside ambient temperature and the working temperature inside the shelter. The cooling requirement is for a 20C temperature difference between maximum outside ambient temperature and the working temperature inside the shelter.

- **Flooring:** Both possibilities of hard and soft type flooring system capable of withstanding the load weight of the aircraft and to accommodate one (1) degree of ground slope in both directions. Pressure on the floor 200 psi (all surface).
- **Power:** Power generator set to start up/power diesel heaters separate from the lighting and outlet generators. Any power required to run air conditions would be supplied by the CAF.
- **Storage & Transportation:** The DMF must be stored and transported inside 20 ft. ISO Type 1C (8ft x 8ft x 20ft) Convention for Safe Containers & TIR certified ISO sea worthy container(s). Due to truck movement limits the maximum gross weight of each container must be limited to 8165 kg.
- **Fire Protection:** Fire resistance materials and a fire suppression system are required.

Attachment #3, Statement of Operational Requirements elaborates on DND needs and provides suppliers with the necessary perspective.

## Required Information

This Request for Information is not a solicitation. No contract will be awarded as a result of this Request for Information. However, information/ suggestions/ approaches submitted by industry will be analyzed and may be used in a future competitive solicitation. Suppliers are requested to provide the following information to demonstrate their ability to meet the required performance characteristics:

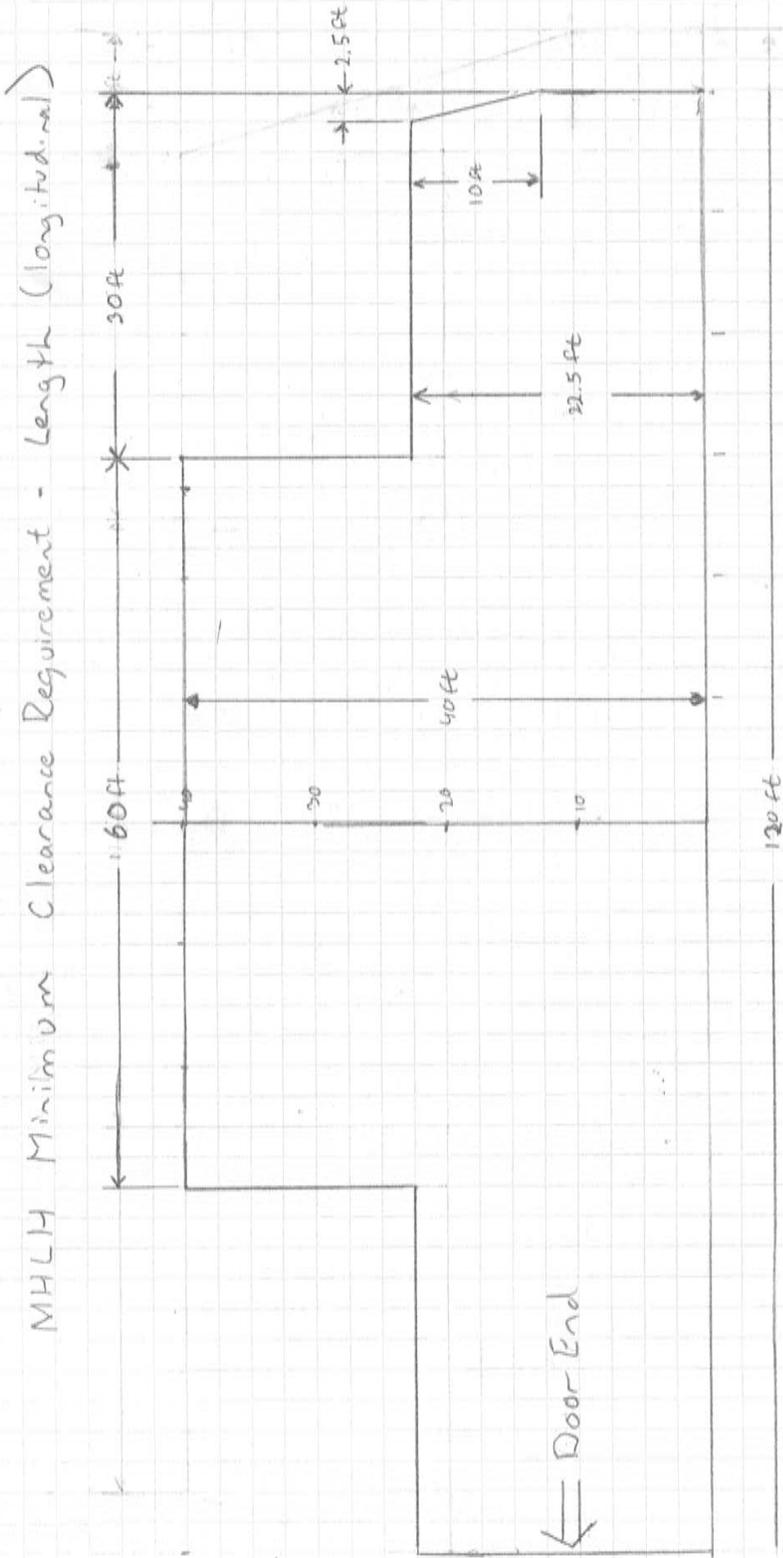
- Company experience in design and manufacture of similar DMF capability.
- Brochures and any other information / technical characteristics that could be of interest.
- Locations and contact information where similar DMF capabilities are presently being used & could be viewed; and
- Estimated price.

In addition, industry comments should address the following questions, as a minimum:

1. Is a commercial product and technology already available? If yes, will it need to be modified to meet DND needs? If no, will a new product need to be developed to meet the performance specifications?
2. What would be the approximate lead time for delivery once a contract is signed?
3. What will be the required size (L x W x H) of the structure based on the clearance provided? Please provide inside and outside dimensions of the structure (see the Attachments 1 & 2)

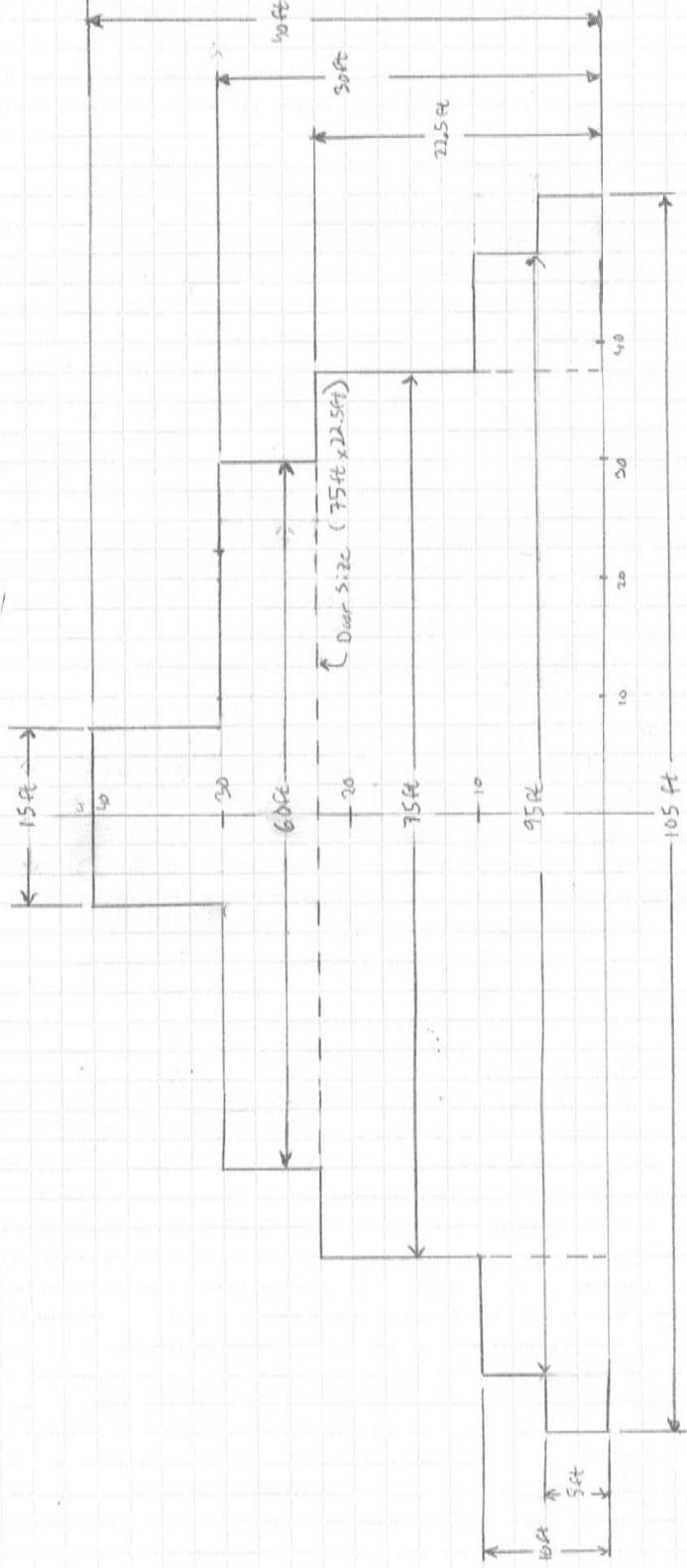
4. How will heavy snow / freezing rain conditions affect the structure of the shelter?  
Will DMF survive a heavy snowfall or freezing rain? What is company approach for those conditions?
5. How will ground conditions of 1 degree slope on both directions longitudinal and transversal affect installation? What is the flooring solution to accommodate 1 degree slope?
6. What are proposed solutions for flooring in arctic conditions (i.e. shelter installed over permafrost ground)?
7. What types of materials would be used in the construction of the shelter given an expected life of 20 years?
8. How translucent would the material be?
9. How feasible is a separate ventilation system and heating and cooling system?
10. What are the heating and cooling (BTU) required at the extreme ends of the temperature scale proposed?
11. What are the requirements for storage and transportation (i.e. number of ISO shipping containers)?

### Attachment #1



### Attachment #2

MHLH Minimum Clearance Requirement - Width (transversal)



*Attachment #3*

**Statement of Operational Requirement**

**CH 147F Chinook Tactical Aviation**

**Light Weight Rapid Deployable Maintenance Facility (DMF)**

## **1. INTRODUCTION**

### **1.1. Aim**

The aim of this document is to state operational requirements specific to CH147F Chinook Helicopter's DMF.

### **1.2. Objectives**

- 1.2.1. RCAF has just introduced a new fleet (fifteen CH147F aircraft) that requires being mobile with integral support.
- 1.2.2. The requirement is for two DMFs.

### **1.3. Key Assumptions**

- 1.3.1. Carry out maintenance activities in austere conditions.
- 1.3.2. Environmental conditions will be extreme and varied.

## **2. SYSTEM OPERATION**

### **2.1. Environment**

- 2.1.1. Operating Climate Zone: C2 is rated to -46 degrees Celsius +51 degrees Celsius.
- 2.1.2. DMF needs to be adaptable for hot and cold weather operations.
- 2.1.3. DMF must be capable of operating reliably in all expected operational environments (domestically and expeditionary) in accordance with Climate Zone classification C2.

### **2.2. Threats**

- 2.2.1. Strong wind conditions would be a threat consideration to DMF which include aircraft rotors downwash; heavy snow loads; damage to plastics and fabric materials; rain and moisture corrosion to metals; and mold and mildew.
- 2.2.2. Numerous assemblies and disassemblies could cause damage to DMF.
- 2.2.3. Packaging and dunnage – improper packaging and dunnage could cause damage to DMF.

## **2.3. Concepts of Operations**

Once raised, the DMF will be used to provide shelter for the following maintenance tasks:

- 2.4.1.1 Aircraft snag repairs;
- 2.4.1.2 Scheduled, unscheduled and special inspections;
- 2.4.1.3 Aircraft modifications;
- 2.4.1.4 Refinishing touch ups;
- 2.4.1.5 Weight and balance; and
- 2.4.1.6 Adhesive, potting, sealant application and curing.

## **2.4. Concept of Support**

- 2.4.1. DMF equipment will be stored outside.
- 2.4.2. The OEM will provide a training video for assembly and disassembly.
- 2.4.3. CAF personnel will be responsible for
  - DMF assembly and disassembly;
  - Equipment Maintenance; and
  - Refresher training.

## **2.5. Concept of Movement**

- 2.5.1. Equipment Storage Containers: Dimensions 20ft long, 8 Ft high and 8 ft. wide (ISO Standard Type 1C).
- 2.5.2. Sea Transport: The storage containers must be sea worthy.
- 2.5.3. Packaging and Dunnage:
  - DMF equipment must be put into purpose built containers that will protect it while in storage and transport.
  - DMF requires purpose built reusable dunnage inside container to protect equipment during angle loading/unloading and high vibration environment during transport.

- Equipment inside containers must be assessable to allow for lift with fork lift and Zoom Boom if one is available (equipment on pallets).
- Equipment on pallets must be able to be removed from the storage container on a wheel type system that can be managed by a small crew (eight people). Wheel system must provide clearance and maneuverability to push equipment over rough terrain.
- When it is practical, equipment is to be packaged to allow for an eight man carry not heavier than 170 Kg.
- Equipment packaging must equipped with lift points, accesses for fork lift tines and man carrying handles.
- Identification of equipment and weight must be clearly stated on the outside of the package. Packaging must be water proof.

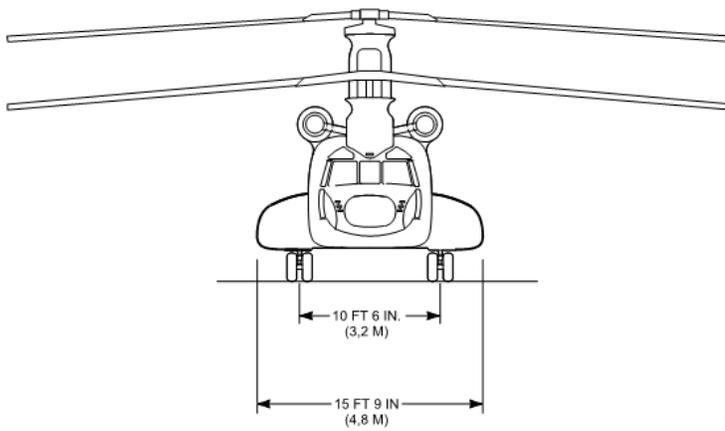
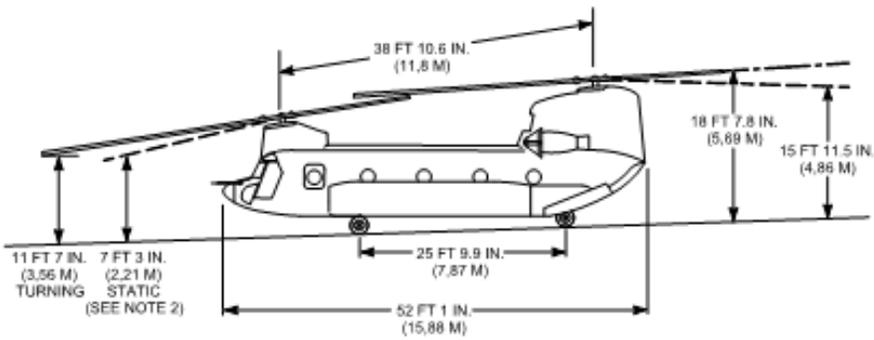
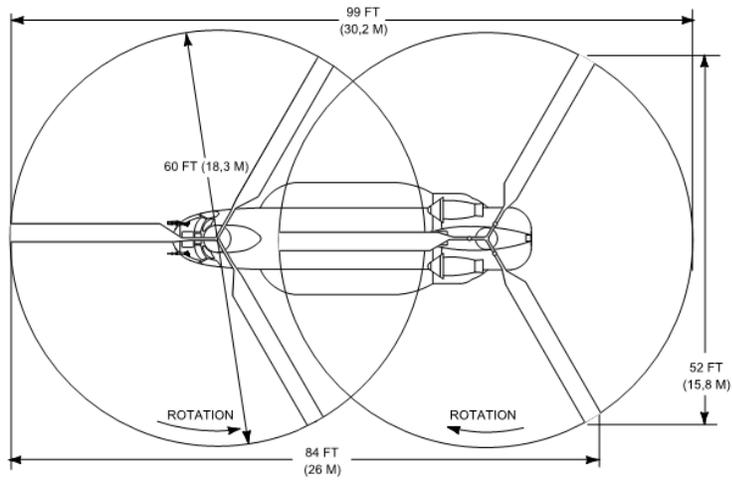
## **2.6. Key Tasks**

- 2.6.1. Provide enough space to fully insert one CH147F with space around the aircraft to work and position maintenance stands and spider crane extension (Model URW370C2U).

## **3. DESIGN AND CONCEPT GUIDANCE**

### **3.1. Design considerations**

Aircraft External dimensions: The critical external dimensions are: total length 99 feet (30,2 m), overall fuselage length 52 feet, 1 inch (15,88 m), fuselage width 15 feet, 9 inches (4,8 m), and rotor disc diameter 60 feet (18,29 m). When the flight controls are out of the neutral position, it is possible for the forward rotor blade clearance from the ground to be as low as 4 feet, 3 inches (1.29 m).



- 3.1.1. To accommodate one CH147F with blades installed, maintenance stands and spider crane (Note: spider crane is mobile and it can maneuver around aircraft).
- 3.1.2. Doors: Opening at one end large enough to tow aircraft into the shelter. If door system includes a sill it must be able to sustain the weight of the A/C and provide a smooth transition for aircraft towing. Six doors required at middle and corners of structure.
- 3.1.3. Flooring
  - (a) Levelling: Built in levelling system for 1 degree slope in any direction.
  - (b) Anchoring: to include a system that will fasten to concrete, hard ground, sand, ice and rock.
- 3.1.4. Colour: Exterior colour to be natural: for example, light Tan, grey or green. Interior colour is to be white.
- 3.1.5. Inlet and outlet ports: heating port, venting, air circulation ports, electrical and data cabling ports.
- 3.1.6. Lighting: DMF material to be partially translucent to allow natural light in during day. Equipped with built in low power led lighting.
- 3.1.7. Site: DMF erection sites will be varied. In ideal conditions with time permitting the site will be prepared and leveled before set up. In the worst conditions it may be used in a rugged environment (i.e. flat meadow) with minimal ground preparation.

## **4. SYSTEM EFFECTIVENESS REQUIREMENTS**

### **4.1. General Requirements**

- 4.1.1. The CH147F DMF capacity shall be large enough for one entire CH 147F aircraft, maintenance stands around the aircraft and extension of the spider crane.
- 4.1.2. Aircraft Requirements: Provide shelter from external elements such as rain and dust while in disassembled state. Provide shelter from external elements to allow adhesives to cure and to reduce icing before flight.
- 4.1.3. Technicians: Provide shelter for technicians from external elements while working on aircraft.
- 4.1.4. Eight personnel without heavy equipment must be able to adequately assemble the DMF structure within 18 hrs. The assembled DMF must provide the ability to safely push the aircraft inside for overhead cover from the elements.

- 4.1.5. Complete assembly with all necessary systems such as doors lighting and heating can follow with an additional 18 hrs maximum for completion.

## **4.2. Survivability**

- 4.2.1. DMF is required to withstand:

- Temperatures -46 degrees to +51 degrees Celsius;
- Rain; and
- Heavy snow & freezing rain.

- 4.2.2. DMF must be:

- Snow load resistant (snow slides off structure);
- Fire resistant; and
- Able to survive assembly and disassembly without damage and/or requirement for consumables.

- 4.2.3. DMF containers must provide environmental protection against risk of mold and rust.

## **4.3. Maintainability**

Although minimum maintenance is desirable, the following is essential:

- Users Training Plan;
- Training Course with video;
- Installation/ Assembly Instructions;
- Manual, Maintenance Instructions;
- Manual Illustrated Parts List;
- Engineering Drawings and Associated Data List;
- Provisioning Parts Breakdown;
- Deployment repair kit;
- Through Life Support Package; and
- Environmental Health and Safety Impact Report.

#### **4.4. Reliability Life Cycle considerations:**

- 4.4.1. Mission Life: DMF is expected to be needed for 20 years.
- 4.4.2. Physical Life: DMF is expected to function for 10 years in storage state and 5 years in erected state.
- 4.4.3. Technological Life: DMF is expected to be technologically useful for a 20 year period.

#### **4.5. Safety and Health**

- 4.5.1. Fire prevention: DMF materials must be fire resistant and be equipped with portable firefighting equipment.

#### **4.6. Training**

- 4.6.1. Initial training must be provided by the OEM with a training package. Two sessions of training are to be provided, once upon DMF delivery and a second session within one year after the delivery.