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Bid Fax: (819) 997-9776

**SOLICITATION AMENDMENT**  
**MODIFICATION DE L'INVITATION**

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

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

**Comments - Commentaires**

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

**Issuing Office - Bureau de distribution**  
Vehicles & Industrial Products Division  
11 Laurier St./11, rue Laurier  
7A2, Place du Portage, Phase III  
Gatineau, Québec K1A 0S5

<b>Title - Sujet</b> TYPES 1 AND 3 AMBULANCES FOR DLR	
<b>Solicitation No. - N° de l'invitation</b> W8476-144753/A	<b>Amendment No. - N° modif.</b> 002
<b>Client Reference No. - N° de référence du client</b> W8476-144753	<b>Date</b> 2014-02-26
<b>GETS Reference No. - N° de référence de SEAG</b> PW-\$\$HP-912-64449	
<b>File No. - N° de dossier</b> hp912.W8476-144753	<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 2014-03-14</b>	
<b>Time Zone</b> Fuseau horaire Eastern Standard Time EST	
<b>F.O.B. - F.A.B.</b>	
<b>Plant-Usine:</b> <input checked="" type="checkbox"/> <b>Destination:</b> <input checked="" type="checkbox"/> <b>Other-Autre:</b> <input type="checkbox"/>	
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<b>Destination - of Goods, Services, and Construction:</b> <b>Destination - des biens, services et construction:</b>	

**Instructions: See Herein**

**Instructions: Voir aux présentes**

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

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This solicitation amendment 002 is raised to answer questions from bidders, amend Annex "B" purchase description and to extend the closing date.

The closing date is extended to 14 March 2014.

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1. Questions from Bidders;

Question 2

We would like to request clarification of the welding certification requirement section 1.4 of the technical spec. Can you clarify if it is the manufacturers responsibility to ensure compliance with just one of the three items listed under section b (i, ii, iii), or all 3 items listed?

Answer 2

Manufacturers/Primary OEMs not meeting the requirement specified in paragraph 1.4 a. are required to comply with paragraph 1.4 b. in its entirety, including all three items listed (1.4 b. i, ii, and iii).

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Question 3

Page 20, Paragraph 3.8 e. Extrication Tools - An extrication combination tool is specified. This item is a rescue device that is connected to a hydraulic power system and is used to shear or pry the metal structure of a vehicle to facilitate casualty extraction from a motor vehicle or other structure. There is no hydraulic system mentioned in the RFP document, are we to assume that the supply of said hydraulic system is to be provided by Canada? If so, will this system be installed on the ambulances? If so, for the purposes of the RFP, should the provisions for this system be considered in the pricing and specifications/design?

Answer 3

The extrication combination tool specified in paragraph 3.8 e is not intended to be hydraulically powered.

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Question 4

Page 15, paragraph 3.7.6.k.iv glass tinting - Can you clarify if the 20% level of glass tinting is for guidance only?

Answer 4

The level of glass tinting is not for guidance only. Paragraph 3.7.6.k.iv is updated to "Have a fixed window made of automotive grade laminated glass in each door with the level of glass tinting **between 10% and 20%**, to reduce solar heating effects. If aftermarket tinting is used, it ***shall*<sup>(E)</sup>** be a metallic film with **between 10% and 20%** "Visible Light Transmission" of a smoke charcoal colour".

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### Question 5

Page 16, paragraph 3.7.8 d - Have rounded edges and return to a height of 100 mm up the walls of the shelter. Can you define what “walls of the shelter” means? Please clarify, if the 100mm is for guidance only?

### Answer 5

The measurement specified in paragraph 3.7.8 d. is not for guidance only. Paragraph 3.7.8 d. is updated to “The ambulance body floor *shall* be sealed with rounded edges that extend from the floor up the Ambulance body walls/cabinets/benches a minimum of 60mm, to prevent fluids from seeping under walls/cabinets/benches, minimizing containment areas for the incubation of viruses transmitted in fluids.”

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### Question 6

Page 18 paragraph 3.7.12.c.ii - A storage surface for use with the squad bench safety netting provided as per paragraph 3.8(1); refers to below:

Page 21 paragraph 3.8.1 Safety Netting – Removable, heavy duty safety netting for the shelves described in paragraph 3.7.10(d) And with a sufficient number of mounting points on the floor and roof to prevent items slipping through the netting;

Can you clarify what is expected by these two points?

Can you provide a picture or drawings?

### Answer 6

To clarify the requirements: Page 18, paragraph 3.7.12.c.ii has been removed from the purchase description. Page 21, paragraph 3.8.1. is updated to “Safety Netting - Removable, heavy duty safety netting mounted in front of the squad bench, with mounting points on the floor and roof;”

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### Question 7

Page 18 paragraph 3.7.13.a.ii - Attachment points for the front and rear securement *shall* be mounted such that the cot can be mounted in three locations.

Paragraph 3.7.12.a asks for left and center line cot configuration. What is the third location?

### Answer 7

Page 18, paragraph 3.7.12.a. is updated to “... position locations, 1) centreline, 2) towards the roadside of the passenger compartment and 3) flush against the roadside innermost surface of the passenger compartment...”. For guidance only, position number 2 is intended to be located approximately 254mm (10”) away from the innermost surface of the passenger compartment.

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### Question 8

Page 19, paragraph 3.7.13.b.ii - Be horizontally and vertically adjustable without having to move from a seating position.

Does vertically adjustable mean: up and down height adjustment or backrest recline? **NOTE:** Up and down height adjustable seats are a very special request for attendant seats and to our knowledge is not MOH 5.0.

Answer 8

On page 19, in paragraph 3.7.13.b.ii. "Vertically" does mean height adjustable up and down. Attendant size varies widely, accessibility to a patient is critical, therefore seating adjustability is important. Assuming MOH 5.0 is a reference to "Ontario Provincial Land Ambulance & Emergency Response Vehicle Standard Version 5.0", this standard only specifies that the attendant seat complies with CMVSS requirements.

Question 9

Page 19, paragraph 3.7.15 and page 21, paragraph 3.9.2.j

Can you clarify if the suction pump system *shall* be portable, permanently mounted or both? By paragraph 3.9.2.j, a switch on the action wall to control the electric vacuum pump is specified. **NOTE:** The switch can't control a portable vacuum pump.

Answer 9

The Suction Aspiration System *shall* be portable in accordance with paragraph 3.7.15 a. Page 22, paragraph 3.9.2.j, has been removed from the purchase description.

Question 10

Proof of Compliance

3.1(f) Type I 4x4 Centre of Gravity Calculation – Proof of Compliance

3.1(f) Type III 4x2 Centre of Gravity Calculation – Proof of Compliance

Since these points are asking for the center of gravity of the built unit. It can't be provided prior to the manufacturing of the units. Can it be estimated for the bid and then corrected at the delivery?

Answer 10

Yes, the bids are expected to include estimated center of gravity calculations based on the proposed designs. The actual center of gravity will be calculated once the vehicles are complete.

Question 11

Is air ride suspension required for type 3 ambulances? Page 11, paragraph 3.6.11, states the rear suspension *shall* be equipped with an air suspension system. In paragraph 4.1.3 it states that the type I variant requires a rear air suspension but there is mention of air suspension in section 4.2 type III requirements.

Answer 11

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Paragraph 3.6.11 applies to both variants. The rear axle *shall* be equipped with an air suspension system. This is important to provide a smooth ride for injured passengers.

Paragraph 4.1.3 only applies to the Type I 4x4 Model. Height adjustable suspension, operated using a switch installed at the rear interior of the passenger compartment is required on the Type I 4x4 Model. The 4x4 has a high ground clearance making it difficult to access the rear door. Height adjustment is required to facilitate the loading/unloading of the main cot.

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#### Question 12

In reference to page 9, paragraph 3.6.4 can we offer a diesel and a gas engine option for the type 3 ambulance? Or does it have to be one or the other?

#### Answer 12

In accordance with paragraph 3.6.4 a. Diesel engines are required for both type I and type III variants.

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#### Question 13

On page 9, in paragraph 3.6.4 b. will the OEM block heater satisfy the requirement for 'cold weather starting aid'?

#### Answer 13

The OEM Block heater will satisfy requirements, as long as the vehicle is able to start at -40C as per paragraph 3.2 a.

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#### Question 14

Can you provide us with a picture or more complete description of the decal package required?

#### Answer 14

Paragraph 3.15 provides the description of the decal package requirements. This level of detail was included to allow bidders to provide pricing. Additional information required by the contractor can be clarified at the preproduction meeting (IAW Paragraph 3.15.h.).

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2. At Annex B Purchase Description;

DELETE: Annex "B" dated 16 January 2014.

INSERT: Annex "B" dated 24 February 2014.

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ALL OTHER TERMS AND CONDITIONS REMAIN THE SAME

**16 January 2014**

**Revised 24 February 2014**



**NOTICE**

This documentation has been reviewed by the technical authority and does not contain controlled goods.

**AVIS**

Cette documentation a été révisée par l'autorité technique et ne contient pas de marchandises contrôlées.

**PURCHASE DESCRIPTION  
FOR**

**TYPE I 4X4 AND TYPE III 4X2, DED, AMBULANCES**

**ECC 140160, 140161**

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OPI DSVPM 4 - DAPVS 4

Issued on Authority of the Chief of the Defence Staff  
Publiée avec l'autorisation du Chef d'état-major de la  
Défense

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## 1. SCOPE

### 1.1. Overview

This purchase description covers the requirements for a modular aluminum ambulance body on a diesel engine driven, dual rear wheel chassis with a full length walk-through from body to cab. The ambulance body will be used to transport one (1) cot, an attendant and up to three (3) seated passengers via a squad bench. The vehicle cab will also have seating for a driver and a passenger. This purchase description includes the requirements for two (2) different ambulance variants, a Type I chassis 4x4 and a Type III chassis 4x2. Paragraph 3 of this document covers common requirements for both variants while paragraph 4 details the variant specific requirements.

### 1.2. Instructions

The following instructions apply to this Purchase Description:

- a. Requirements, which are identified by the word "shall", are mandatory. Deviations will not be permitted;
- b. Requirements identified by "shall<sup>(E)</sup>" are mandatory. The Technical Authority will consider substitutes/alternatives for acceptance as an Equivalent;
- c. Requirements identified with a "will" define actions to be performed by Canada and require no action/obligation on the Contractor's part;
- d. Where "shall", "shall<sup>(E)</sup>", or "will" are not used, the information provided is for guidance only;
- e. In this document "provided" shall mean "provided and installed";
- f. Where a standard or specification is required and the contractor offers an equivalent, that equivalent standard shall be provided upon demand;
- g. Where equipment certification to an SAE standard is required, the contractor shall provide the certification upon request;
- h. Metric measurements shall be used to define the requirement. Other measurements are for reference only and may not be exact conversions; and
- i. Dimensions stated as nominal shall be treated as approximate dimensions. Nominal dimensions reflect a method by which materials or products are generally identified for sale commercially, but which differ from the actual dimensions.

### 1.3. Definitions

The following definitions apply to the interpretation of this Purchase Description:

- a. "Technical Authority" - The government official responsible for technical content of this requirement;
- b. "Equivalent" - A standard, means, or component type, which has been accepted by the Technical Authority as meeting the specified requirements for form, fit, function and performance; and

- c. The term "Quality Assurance Representative" is defined as the government officer responsible for ensuring that the Contractor quality system, material and services supplied meet the contract requirement;
- d. "Guidance" is defined as a requirement that may be followed. The guidance is provided to indicate a preferred component Make and Model or dimension that would be best for the application. However, deviating from a guidance doesn't consider the bid non-compliant;
- e. "Vehicle" is defined as a Diesel Truck chassis complete with an Ambulance van body; and
- f. "Curb Weight" is the empty weight (no payload included) of a fully equipped vehicle. Curb weight shall include the cab and chassis, Ambulance van body, all attached devices, Contractor supplied equipment, and full fuel tanks, lubricants, and coolants.

#### 1.4. Welding Certification

- a. Manufacturers/Primary OEMs shall<sup>(E)</sup> hold certification IAW the Canadian Welding Bureau (CWB) standards to a minimum division three (3) level IAW CSA W47.1 and CSA W47.2.

or

- b. Manufacturers not holding CWB certification shall ensure the following items for consideration by the Technical Authority as an equivalent:
  - i. Individual welders of the manufacturers/primary OEMs shall hold current qualifications IAW CSA W47.1 and CSA W47.2 regulations;
  - ii. A welding engineer shall provide an attestation that the manufacturers/primary OEMs weld standards, weld processes and individual welder's qualifications meet the requirements of CSA W47.1 and CSA W47.2 along with a sample welding procedure and specification.
  - iii. Manufacturers/Primary OEMs shall provide the qualifications of their welding supervisor(s) with capabilities, education, and experience equivalent to requirements set by CWB.

## 2. APPLICABLE DOCUMENTS

### 2.1. Publications

The following documents form part of this Purchase Description. Effective dates shall be those in effect upon the date of manufacture. Sources are as shown:

- a. **Canadian Motor Vehicle Safety Standards (CMVSS)**  
 Transport Canada,  
 Road Vehicle and Motor Vehicle Regulation,  
 330 Sparks Street, Tower C,  
 Ottawa, Ontario K1A 0N5

<http://www.tc.gc.ca/eng/acts-regulations/menu.htm>

- b. Ontario Provincial Land Ambulance & Emergency Response Vehicle Standard**  
VERSION 5.0 - September 28, 2012  
Emergency Health Services Branch  
Ontario Ministry of Health and Long-Term Care
- c. Transport Canada Consolidation of the Motor Vehicle Safety Act (MVSA) and Motor Vehicle Safety Regulations (MVSr) and all applicable revisions TP4360E**  
Canadian Communications Group - Publishing  
Ottawa, Canada K1A 0S9  
<http://www.tc.gc.ca/eng/acts-regulations/menu.htm>  
MVSA - <http://laws-lois.justice.gc.ca/eng/acts/M-10.01/>  
MVSr - [http://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,\\_c.\\_1038/](http://laws-lois.justice.gc.ca/eng/regulations/C.R.C.,_c._1038/)
- d. Canadian General Standards Board**  
Publishing and Depository Services  
Public Works and Government Services Canada  
Ottawa ON K1A 0S5  
<http://publications.gc.ca/site/eng/search/advancedSearch.html>
- e. SAE Handbook**  
Society of Automotive Engineers Inc.  
400 Commonwealth Drive, Warrendale, PA, 15096  
<http://www.saedigitallibrary.org/contact/>
- f. Anthropometric Survey of the Land Forces**  
1998
- g. Underwrites Laboratories of Canada**  
7 Underwriters Road  
Toronto, Ontario, Canada  
M1R 3A9  
<http://www.ul.com/canada/eng/pages/ulcstandards/>
- h. Tire and Rim Association Year book**  
3200 West Market Street  
Akron, Ohio  
USA, 44313  
[http://www.us-tra.org/documents/TRAPublications\\_2013\\_Form.pdf](http://www.us-tra.org/documents/TRAPublications_2013_Form.pdf)
- i. The American Society for Testing Materials (ASTM)**  
[http://www.global.ihs.com/ASTM\\_Standards](http://www.global.ihs.com/ASTM_Standards)
- j. The International Standards Organizations (ISO)**  
1, ch. de la Voie-Creuse  
CP 56 - CH-1211 Geneva 20  
Switzerland  
Tel: +41 22 749 01 11  
[http://www.iso.org/iso/home/store/catalogue\\_ics.htm](http://www.iso.org/iso/home/store/catalogue_ics.htm)
- k. Canadian Welding Bureau (CWB)**  
<http://eng.cwbgroup.org/Certification/Pages/default.aspx>
- l. American Welding Society (AWS)**  
<http://www.aws.org/w/a/certification/index.html>

### **3. REQUIREMENTS**

#### **3.1. Standard Design**

The vehicle design shall:

- a. Be based on the chassis manufacturer's latest model;
- b. Be based on an equipment model having demonstrated industry acceptability by having been manufactured and sold commercially, or, be manufactured by a company that has at least 5 years experience in manufacturing Type I or Type III ambulances;
- c. Conform to all applicable laws, regulations and industry standards governing manufacture, safety, noise levels and pollution in effect in Canada at time of manufacture;
- d. Not have system and component capacities increased above published ratings (i.e. product or component brochures);
- e. Include all components, and accessories normally supplied for the intended equipment application, although they may not be specifically described in this Purchase Description; and
- f. Have a centre of gravity within the OEM's engineering specifications.

#### **3.2. Operating Conditions**

The vehicle/equipment shall operate safely in the following conditions:

- a. Under the extremes of weather conditions found in Canada in temperatures ranging from -40 to 37 degrees Celsius (-40 to 99 degrees Fahrenheit) and cold starting from -40 degrees Celsius with external aids;
- b. After storage for extended periods of time in ambient temperatures of -50 to 60 degrees Celsius (-58 to 140 degrees Fahrenheit); and
- c. Travelling on paved roads, gravel roads, and unpaved secondary roads. Conditions include year round operation on surfaces that will be covered by snow, mud and or ice dependant on the season.

#### **3.3. Safety Standards**

The vehicle/equipment, all systems and components shall:

- a. Be safe and easy to use by a 95<sup>th</sup> percentile male or 5<sup>th</sup> percentile female under all operating conditions in accordance with the Anthropometric Survey of the Land Forces, 1998;
- b. Have all entry and exit points equipped with handles and steps suitably positioned to accommodate a 95<sup>th</sup> percentile male or a 5<sup>th</sup> percentile female under all operating conditions;
- c. Be equipped, where required for operator safety, with safety features such as warning and instruction plates, non-slip walking surfaces and heat shields;
- d. Include the manufacturer's standard bolsters to protect moving people from openings, projections and obstructions; and

- e. Include the grab handles and grab rails to assist persons moving about, seated or entering/leaving the ambulance.

### **3.4. Maintainability**

The vehicle **shall** provide ease of maintenance such that:

- a. All maintenance and repair tasks, especially routine operator maintenance, **shall** be easy to perform with a minimum of special tools and skills;
- b. All major assemblies and components **shall** be rapidly replaced using a minimum of unique tools and equipment, without the requirement to recover the vehicle to a maintenance facility;
- c. All subsystems **shall** permit easy access to all items required for periodic servicing and maintenance;
- d. All processor and software controlled designs new to the vehicle **shall** be provided with built-in test (BIT) diagnostics, readable by crew members without special tools and test equipment;
- e. COTS (Commercial-Off-The-Shelf) items new to vehicle **shall** be subject to their original manufacturer's specification; and
- f. All interior elements **shall** be coated, sealed and waterproofed to be impervious to soap, water, disinfectants and mildew.

### **3.5. Vehicle Performance**

The vehicle with the rated payload **shall**:

- a. Sustain speed of at least 120 km/h (74.6 mph) on flat ground for 30 minutes;
- b. Accelerate from 0 km/h to 90 km/h (55.9 mph) in 25 seconds;
- c. Maintain at least 90 km/h (55.9 mph) on a 3% grade; and
- d. Maintain at least 8 km/h (5.0 mph) on a 35% grade.

### **3.6. Original Equipment Manufacturer (OEM) Cab and Chassis**

The ambulance body **shall** be built on a cab and chassis that can meet all of the requirements outlined in this section.

#### **3.6.1. Chassis Accessories**

The vehicle chassis **shall**<sup>(E)</sup> be the Original Equipment Manufacturer's (OEM) standard for a vehicle of this type and size. The chassis **shall** be equipped with:

- a. Ambulance Prep Package - The OEM ambulance prep package;
- b. Tow Hooks - Two front and two rear tow hooks or loops of sufficient strength and mounting to permit the recovery and tie-down of the fully loaded vehicle. The tow points **shall** be fully accessible without having to crawl under the vehicle;
- c. License Plate Holders - Front and rear licence plate holders, mounted as per the manufacturer's standard;

- d. Skid Plate - A skid plate(s) on the underside of the Cab/Chassis that provides damage protection for the engine and transmission from road debris; and
- e. Running Board - A running board on each side of the cab with sufficient capacity to support a weight of at least 225 kg (496 lbs). The running boards shall<sup>(E)</sup> run from the front mud guard to the ambulance body and have a non-slip surface.

### 3.6.2. Cab

The vehicle shall be equipped with the OEM standard weatherproof, insulated and sound proofed cab. All exterior surface, including the walls, floor and roof, shall be insulated to the manufacturer's standard "R" value. The cab shall<sup>(E)</sup> be equipped with:

- a. Seats - Two OEM leatherette or vinyl seats with arm and high back rests equipped with seatbelts for the driver and front passenger. The seats shall<sup>(E)</sup> be horizontally and vertically adjustable without having to move from a seated position;
- b. Kick Plates - Removable plate covers as per the manufacturer's standard design;
- c. Steering Wheel - A steering wheel of the adjustable/tilt type;
- d. Cruise Control - Cruise control for normal highway operations;
- e. Side View Mirrors - Adjustable side-view mirrors positioned for safe reverse operation. Exterior mirrors shall<sup>(E)</sup> be heated. The mirrors shall<sup>(E)</sup> be a split type with at least 25 percent convex or fully convex. Mirrors shall<sup>(E)</sup> be a standard mirror from the OEM;
- f. Convex Spot Mirror - Supplementary circular convex mirrors bolted to the side view mirrors for additional visibility. The non-reflective surface of the mirror shall<sup>(E)</sup> be a matte, corrosion resistant material such as plastic or painted stainless steel. The road-side mirror shall<sup>(E)</sup> be located below the side view mirror and the curb-side mirror shall<sup>(E)</sup> be located above the side view mirror.
- g. Sun Visors - Two (2) dual panel, rotating and pivoting, interior sun visors that can be used simultaneously for forward and side sun blocking;
- h. Windshield Wipers - Electrical power actuated windshield wipers with variable intermittent speeds;
- i. Windshield Washers - Electrical power actuated windshield washers;
- j. Power Windows - Electrical power actuated driver and passenger windows;
- k. Power Locks - Electrical power actuated locks for driver and passenger doors. The Contractor shall supply at least qty four (4) keys with at least qty (2) having remote keyless entry;
- l. Radio - The OEM standard AM/FM radio. The radio shall<sup>(E)</sup> include a CD player, audio jack (for portable audio devices) and a clock. The

radio system shall<sup>(E)</sup> be connected to an additional speaker installed in the ceiling of the patient compartment above the attendant's seat. Output of this speaker shall<sup>(E)</sup> be controlled by means of a volume and on/off switch located at the action wall;

- m. Coat Hooks - Two coat-hooks for hanging coats;
- n. Beverage Holders - Beverage holders shall<sup>(E)</sup> be below the level of any vehicle electronics.
- o. Walk-Through - A walk-through passage connecting the Ambulance body and the cab as per paragraph 3.7.1(f);
- p. Front Console - The front console shall<sup>(E)</sup> be within easy reach of the driver and passenger.
- q. Airbags - Standard OEM driver and passenger airbags;
- r. Navigation and Backup Camera System - A rear facing colour output camera that activates when the vehicle is reversing. The real time, colour camera display screen shall<sup>(E)</sup> be installed in the cab and have a minimum screen size of 7". The Backup Camera System shall<sup>(E)</sup> incorporate a commercial Global Positioning System (GPS) suitable for vehicle navigation with in-dash mounting capability. The GPS shall<sup>(E)</sup> incorporate a lifetime update aspect to ensure map accuracy.

### **3.6.3. Cab Communication System**

The cab communication system shall provide:

- a. All the required wiring leads and space allocations for installation of the two-way radio. Radio electrical power feed cables provided with fuse protection. Dimensions and power requirements for the radios will be provided at the pre-production meeting;
- b. A P.A. system with sirens and operating modes of hi-lo, yelp, wail, P.A., air horn, and radio re-broadcast. A dual radio hook-up shall be provided and include all electrical and coax cables, antennae and mounts; and
- c. A two-way intercom system for communication between the cab and ambulance body. The two-way intercom system shall have radios mounted on the front console and the action wall.

### **3.6.4. Engine Components**

The following shall<sup>(E)</sup> be provided:

- a. Engine - An OEM turbocharged diesel engine with sufficient power for the performance requirements of paragraph 3.5;
- b. Cold Weather Starting Aid - A manufacturer's standard cold weather starting aid to meet the required operating conditions as per paragraph 3.2(a);
- c. Anti-Theft Device - An anti-theft device that locks the steering and shift lever and allows the engine to keep running and all other mechanical and electrical functions are operable, when the driver has removed the ignition key; and

- d. Automatic Engine High-Idle Speed Control - The vehicle shall<sup>(E)</sup> be equipped with an engine speed control with the following properties:
- i. A system that is pre-set so when it is activated it will increase the engine RPMs to sustain the ambulance's total continuous electrical load, and maximum heating/air conditioning output;
  - ii. The system shall<sup>(E)</sup> be in operating mode whenever the engine is running;
  - iii. The system shall<sup>(E)</sup> be activated automatically whenever the voltage of the OEM or the conversion battery falls below 12.5 volts, and whenever the engine has been allowed to idle for more than 5 minutes;
  - iv. The system shall<sup>(E)</sup> operate only when the transmission is in "PARK";
  - v. The system shall<sup>(E)</sup> disengage when the operator depresses the service brake pedal or the transmission is placed in gear, and automatically re-engage when the service brake is released, or when the transmission is placed in "PARK"; and

#### **3.6.5. Lubricants and Fluids**

The following applies:

- a. The vehicle shall<sup>(E)</sup> be serviced with standard lubricants and fluids compatible with the delivery location and season; and
- b. The engine shall<sup>(E)</sup> operate using OEM standard Oil.

#### **3.6.6. Filtration System**

The vehicle shall be provided with, as a minimum, the following filtration systems:

- a. A fuel filter / water separator incorporating a thermostatically controlled heater to prevent freezing;
- b. A replaceable dry type air filter; and
- c. Spin off replaceable oil and fuel filters.

#### **3.6.7. Transmission**

The vehicle transmission shall be fully automatic and equipped with an overdrive system and auxiliary oil cooler.

#### **3.6.8. Fuel Tank(s)**

The vehicle shall be equipped with a fuel tank or combination of tanks that gives the vehicle a range of at least 500 km (310.7 miles) without refuelling at GVWR travelling over paved roads.

#### **3.6.9. Brakes**

A vehicle hydraulic power brake system shall be provided that incorporates an anti-lock braking system (ABS).

#### **3.6.10. Power Steering**

The vehicle shall be equipped with power steering.

### **3.6.11. Suspension**

The vehicle front suspension shall be the manufacturer's standard. The rear axle shall be equipped with an air suspension system. The air suspension shall:

- a. Have an integral air tank with a manually operated drain valve to permit the removal of moisture; and
- b. An air dryer to minimize the moisture build-up within the air tank.

### **3.6.12. Axles**

The vehicle front and rear axles shall be the manufacturer's standard. The GAWR for each axle shall be sufficient to support the total load imposed on the axle when the vehicle is fully loaded.

### **3.6.13. Tires and Wheels**

The vehicle tire and wheel requirements shall include:

- a. Steel belted tubeless, with a specified payload, radial ply tire of the same size and ply rating on all wheels. All tires shall be mud/snow type, marked such as "M+S". Ply ratings shall be tabled in the Tire and Rim Association Year book;
- b. Wheels and rims with dual spacing in accordance with Tire and Rim Association Standards that can be operated safely at GVWR in operating conditions. All wheels shall<sup>(E)</sup> permit the use of tire chains;
- c. Dual rear wheels and tires;
- d. Rear inner tires with stem valve extension for easy access;
- e. Each tire shall balance within practicable limits wheels, hubs and brakes shall be effectively balanced. Balancing shall be adequate to preclude wheel shimmy at all vehicle speeds;
- f. A spare wheel, rim and tire of same ply and rating;
- g. The wheels shall comply with the axle manufacturer's rating for imposed loads and operating conditions;
- h. Spare Wheel Assembly Mount - The vehicle spare wheel assembly shall be provided and accessible from ground level; and
- i. Tire Changing Tools - Tire changing tools and a heavy-duty jack with sufficient force of lifting the vehicle at GVWR shall be provided. The tools shall<sup>(E)</sup> be stored in a compartment accessible from the exterior.

### **3.6.14. Cab and Chassis Corrosion Protection System**

The following shall be provided for the vehicle cab and chassis:

- a. In addition to standard factory rust proofing, aftermarket rust proofing shall be provided. The treatment will normally be applied within the first year of service. The treatment date will be directed by the Technical Authority to optimize seasonal rust prevention benefits. If not demanded prior to delivery, a pre-paid certificate authorizing treatment at an aftermarket outlet shall be provided with the vehicle.

- b. Metal surfaces treated with a rust preventive oily film product having the following properties:
  - i. Moisture displacing.
  - ii. Creeping (capillary action).
  - iii. Low solvent content.
  - iv. Compatibility with rubbers, plastics and all other materials used in automotive construction.
  - v. Non toxic.
  - vi. Minimal dripping.
- c. Written proof of a twelve hour ASTM B117 salt spray endurance test certification by an independent test laboratory prior to first pre-delivery inspection. Krown Rust Kontrol and Rust Check products have been accepted as certified, proof not required; and
- d. The application includes, but is not limited to the underside of fenders and hood, enclosed and boxed-in sections, seams, mouldings, crevices, weld points, under-body and exposed exterior brackets.

### **3.7. Ambulance Body**

The ambulance body **shall** meet all of the requirements outlined in this section.

#### **3.7.1. Ambulance Outer Body Construction**

The ambulance **shall**<sup>(B)</sup> have:

- a. A fully welded extruded aluminum frame clad with an outer skin of aluminum material;
- b. All surfaces, edges, corners and joints that can be exposed to any fluid shall be sealed by an approved waterproof bonding material such as or equivalent to "silaprene";
- c. The Contractor **shall**<sup>(B)</sup> take all necessary action to prevent electrolytic action between dissimilar metals and materials.
- d. An outer roof and floor-pan that are each constructed of a single piece of metal;
- e. Integral Rain Gutter - An integral rain gutter at the roof perimeter extrusion to permit run-off at the body corners. A surface mounted, mechanically fastened rain gutter moulding in this area is not acceptable;
- f. Walk-Through - An open passage between the cab and body to allow vehicle occupants to transit (forward/rearward) between the ambulance body and the cab; and
- g. Rear Wheel Housings - Rear wheel housings that are constructed of a self-cleaning, heavy material used to deflect water and objects thrown

by the tires. The rear wheel housing shall<sup>(E)</sup> be equipped with heavy-duty sound-proofing.

### **3.7.2. Ambulance Body Mounting**

The body shall<sup>(E)</sup> be mounted to the vehicle with high strength steel bolts and vibration isolating rubber body mounts designed and installed for ease of remounting. All body mounts shall<sup>(E)</sup> be designed and installed in accordance with the chassis manufacturer's guidelines. Reinforcements or filler blocks should be used where the mounting device(s) may deform frame flanges. Mounting devices shall<sup>(E)</sup> be locked units which will minimize loosening, but may be tightened if necessary, and mounted so as to prevent any shifting of the body.

### **3.7.3. Ambulance Body Protection Accessories**

The vehicle shall<sup>(E)</sup> be equipped with the following accessories:

- a. Fenders - Fenders over all wheels and tires. Fender extension(s) shall<sup>(E)</sup> be provided where these wheels extend beyond the body of the vehicle;
- b. Front Mud Flaps - Mud flaps for the front wheel openings made of heavy duty aluminum diamond tread plate another material of equivalent performance. Front mud flaps shall<sup>(E)</sup> cover the full width of the wheel well;
- c. Rear Mud Flaps - Mud flaps for the rear wheel openings made of heavy duty rubber or another material of equivalent performance. Rear mud flaps shall<sup>(E)</sup> cover at least the full width of the rear wheel;
- d. Safety Grab Rails - All safety grab rails shall be yellow and have rubberized grip.
- e. Stone Guard - The manufacturer's standard stone guard, extending from the cab to the front corners of the body. The guard shall<sup>(E)</sup> be made of the heavy-duty aluminum diamond tread plate or another material of equivalent performance.
- f. Rear Step Bumper - A rear step bumper that shall:
  - i. Support a weight of at least 225 kg (496 lbs);
  - ii. Be at least 240 mm (9.4 inches) wide and run the width of the rear door opening;
  - iii. Hinge or pivot with the most durable commercially available hardware to permit ambulance attendants to move closer for loading and unloading;
  - iv. Maintain the OEM ground clearance and step bumper angle of departure; and
  - v. Be protected by corner bumper frames with protruding rubber bumperettes with impact rating of at least 8 km/h (5.0 mph).

### **3.7.4. Exterior Ambulance Body Doors**

The exterior ambulance body doors shall be constructed as per paragraph 3.7.6. The exterior ambulance body shall have the following doors:

- a. Side Exit Door - Single door located on the curb-side of the ambulance body that hinges to the right to allow passage between the outside and the patient compartment;
- b. Rear Doors - Double doors on the rear ambulance wall. The doors **shall** be equally sized to allow passage between the outside and the patient compartment.
- c. Compartment Doors - Doors located on the sides of the vehicle to house each external compartment unit described in paragraph 3.7.9. The doors **shall** be hinged so that each door opens towards the front of the vehicle or upwards. The locations of each door will be finalized during the pre-production meeting.

**3.7.5. Interior Ambulance Body Doors**

The interior ambulance body doors **shall** be constructed as per paragraph 3.7.7 and **shall** be designed and built to avoid unwanted opening in transit or as result of a vehicle collision. The ambulance body **shall**<sup>(E)</sup> have at least the following doors:

- a. Interior Storage Compartment Doors - Two sliding doors that open left and right to allow access to each interior storage compartment as described in paragraph 3.7.10(d);
- b. Interior Oxygen Gas Compartment Door - Single door hinged to open towards the front of the vehicle to allow access to the oxygen compartment described in paragraph 3.7.14;
- c. Interior Oxygen Gauge Access Panel - A clear plastic access panel centrally located on oxygen gas compartment door of sufficient size to allow access to the oxygen compartment for reading the pressure gauge and turning on the valve as described in paragraph 3.7.9a; and
- d. Walk-Through Door - A door separating the cab and ambulance body that slides in the direction of the driver's seat;

**3.7.6. Ambulance Body Exterior Door Construction**

The exterior ambulance body doors **shall**:

- a. Open outwards unless otherwise indicated;
- b. Have maximum construction commonality to the ambulance body;
- c. Be designed to prevent ingress of water, dust, or debris;
- d. Have panel construction that is easily removed and replaced to allow maintenance of door locks and hardware;
- e. Have suitable pneumatic hold-open devices;
- f. Have check straps, metal door stops or equivalent devices to prevent the doors from hitting the ambulance body;
- g. Have paddle lock handles that are flush mounted;
- h. Have heavy-duty door locks designed for exterior use. All locks **shall** be keyed alike;

- i. Have a secondary system that will allow the doors to be opened should the main door lock mechanism(s) fail;
- j. Have full-length piano hinges with a pin of a minimum of 6mm diameter;
- k. The rear doors **shall**:
  - i. Be dual doors with vertical full-length piano hinges;
  - ii. Open independently to at least 150°;
  - iii. Have a rubber tarp strap of at least 560 mm (22.0 inches) with S hooks installed in each of the lower outer corners of the doors. The straps are to provide additional security when hooked to the outside ends of the rear bumper; and
  - iv. Have a fixed window made of automotive grade laminated glass in each door with the level of glass tinting **between 10% and 20%**, to reduce solar heating effects. If aftermarket tinting is used, it **shall<sup>(E)</sup>** be a metallic film with **between 10% and 20%** "Visible Light Transmission" of a smoke charcoal colour.
- l. The side door **shall<sup>(E)</sup>** have:
  - i. A vented window made of automotive grade laminated glass in each door with 20% level of glass tinting to reduce solar heating effects. If aftermarket tinting be used, it **shall<sup>(E)</sup>** be a metallic film with 20% "Visible Light Transmission" of a smoke charcoal colour. The window **shall<sup>(E)</sup>** be equipped with a lock and a screen.

### **3.7.7. Ambulance Body Interior Door Construction**

The ambulance body interior doors **shall<sup>(E)</sup>**:

- a. Be designed and built with a positive hold close latch devices to avoid unwanted opening in transit;
- b. The walk-through passage door **shall<sup>(E)</sup>** have a release handle on both cab and ambulance body sides of the door, and no locking mechanism;
- c. Have sliding doors made of a heavy duty, transparent, non-shattering material such as Plexiglas or polycarbonate which complies with Transport Canada Regulations;
- d. Have a system that allows the sliding doors in their frame to flip up or down to allow full width and height access to the storage compartment; and
- e. Have handles for ease of opening;

### **3.7.8. Ambulance Body Floor Construction**

The ambulance body floor **shall**:

- a. Be at the lowest level permitted by the chassis/body;
- b. Be reinforced where necessary to support a load of at least 735 kg/m<sup>2</sup> (151 lb/ft<sup>2</sup>);

- c. The floor covering **shall** be bonded to the ambulance body floor. It **shall** provide slip resistance throughout the thickness of the material, be a minimum of 2mm thick, and be bonded to the sub-floor with a waterproof adhesive. Have a heavy duty, anti-static, seamless, one piece, fireproof, non wax type, mark resistant, and scuff proof safety floor covering for the patient compartment. LONCOIN® **shall**<sup>(B)</sup> be acceptable.
- d. Be sealed with rounded edges that extend from the floor up the Ambulance body walls/cabinets/benches a minimum of 60mm, to prevent fluids from seeping under walls/cabinets/benches, minimizing containment areas for the incubation of viruses transmitted in fluids; and
- e. Have protective trim to prevent fluid seepage under cabinets and walls.

### **3.7.9. Exterior Storage Compartments and Mounting**

Exterior storage compartments on the ambulance body shall be made of aluminum. The ambulance body **shall**<sup>(B)</sup> have:

- a. Oxygen Compartment - An oxygen compartment for the oxygen system as per paragraph 3.7.4 accessible from the exterior and interior.
- b. Equipment Compartment (Common Equipment) - An equipment compartment accessible from the exterior;
- c. Half-Height Backboard Compartment - A backboard compartment accessible from the exterior;
- d. Electrical Compartment - An electrical equipment compartment accessible from the exterior;
- e. Spare Wheel Assembly Compartment and Mount - A spare wheel assembly compartment and mount with tire changing tools;
- f. Road Flare Case Securement - The manufacturer's standard quick release bracket for the road flare case provided as per paragraph 3.8(i) located in the one of the exterior storage compartments; and
- g. Extrication Tool Storage - A storage location in one of the exterior compartments for the extrication tools provided as per paragraph 3.8(e);

### **3.7.10. Interior Shelving, Storage and Mounting**

Shelves and storage units within the ambulance body **shall**<sup>(B)</sup> be made of aluminum. The ambulance body **shall**<sup>(B)</sup> have:

- a. Action Wall - An action wall on the road-side of the ambulance body that contains an action area towards the front of the cab that is at a level accessible by the attendant when seated in the attendant's chair;
- b. Clock Mount - A clock mount on the rear of the interior of the ambulance body above the rear doors that allows the clock, provided as per paragraph 3.8(c), to be mounted/dismounted for battery replacement without the use of tools;

- c. Dedicated Container Location - A dedicated location for the waste, hazardous waste, glove and sharps containers, as per paragraphs 3.8(f) and (g), in the patient compartment that is convenient to access when working in the area of the stretchers. The sharps container shall<sup>(E)</sup> be mounted in a compartment under the squad bench accessible via a kick out door;
- d. Interior Storage Compartments - Common storage compartments accessible from the interior through doors as described in paragraph 3.7.5(a);
- e. Incubator Tie-Down - A fixture to secure the rear tie-downs for incubators. Location to be determined at the pre-production meeting;
- f. Cylinder Securement Fixture(s) - The fixture(s) required to secure two jumbo "D" cylinders located in the interior of the patient compartment as part of the oxygen system of paragraph 3.7.14. The fixture(s) shall be appropriate for storing steel or aluminum cylinders;
- g. IV Securement - Two wall or ceiling mounted IV hooks with Velcro securing straps for IV pouch solutions at the midsection of each cot/stretcher location (for a total of four hooks); and
- h. Fire Extinguisher Securement - The manufacturer's standard quick release bracket for two fire extinguishers provided as per paragraph 3.8(h). Locations to be determined during pre-production meeting;

### 3.7.11. Shelving and Storage Construction

The shelving and storage in the Ambulance body shall have the following components:

- a. The action area as described in paragraph 3.7.10(a) shall:
  - i. Provide a work surface for the attendant seated in the main attendant seat that retains loose material and is easy to clean;
  - ii. Include on the wall near the work surface (the action wall):
    - a. The main oxygen outlet as per paragraph 3.7.14b;
    - b. The suction outlet;
    - c. The IV warmers;
    - d. The controls as per paragraph 3.9.2;
    - e. The fittings for the two way radio as per paragraph 3.6.2(a);
    - f. Thermostat.
  - iii. Include the defibrillator platform described in paragraph 3.8(k).
- b. Interior storage compartments as per paragraph 3.7.10(d) that shall have at least 3 shelves. The shelves shall be adjustable or removable and have sufficient capacity to support loads of 100 kg/m<sup>2</sup> (20.5 lb/ft<sup>2</sup>); and
- c. Exterior storage compartments shall have dry deck flooring;
- d. Include an oxygen cylinder storage compartment as per paragraph 3.7.9(a) that shall:
  - i. Have a mounting cradle suitable for storing Types M and MM oxygen cylinders made of aluminum or steel;

- ii. Be designed for simple cylinder transfer and for cylinder type changeover using only simple hand tools; and
- iii. Have a protective coating on the mounting cradle to prevent damage to aluminum cylinders.

### **3.7.12. Passenger Securement Layout**

The ambulance passenger securement layout **shall**<sup>(E)</sup> include:

- a. **Main Cot** - The Stryker MX Pro 3 with position locations, 1) centreline, 2) towards the roadside of the passenger compartment and 3) flush against the roadside innermost surface of the passenger compartment, oriented with the patient's head pointing toward the cab. The mounting system for the main cot **shall** be installed so that it has a minimum clearance of 150 mm (5.9 inches) from any surface or obstruction and a minimum of 330 mm (13 inches) from the rear facing attendant's seat;
- b. **Main Attendant's Seat** - An attendant's seat located at the head of the main stretcher mounted on a seat pedestal of at least 250 mm (9.8 inches) in height;
- c. **Bench** - A squad bench located along the curb-side wall with a height of at least 405 mm (15.9 inches) and designed to provide an aisle space of at least 335 mm (13.2 inches). The bench **shall**<sup>(E)</sup> have the following:
  - i. A lid for the storage unit located under the bench;
  - ii. Requirement 3.7.12.c.ii. Removed.
  - iii. A seat for up to three passengers; and
  - iv. The posts and wheel cups necessary for mounting a T3 Light Weight Assault Litter while in use. The placement of the mounts **shall**<sup>(E)</sup> be such the stretcher and patient can be accommodated without removing any cushions from the squad bench and to allow maximum aisle space between the litter and the main cot.

Note: The T3 Light Weight Assault Litter is approximately 2540 mm (100 inches) when fully extended.

### **3.7.13. Passenger Securement Construction**

The ambulance passenger securement **shall** include:

- a. The Stryker Mx Pro 3 or equivalent detachable mount installed for safe use of the main cot described in paragraph 3.7.12(a) in the road-side and centerline positions. Included in the installation **shall** be the rear door threshold safety hook required for the Stryker Mx Pro 3 cot as well as the one or more fixtures to secure the rear tie-downs for incubators (as per paragraph 3.7.10(e)). The following applies:
  - i. The securement for the cot **shall** be heavy duty to prevent movement of the cot during transit; and
  - ii. Attachment points for the front and rear securement **shall** be mounted such that the cot can be mounted in three locations;

- b. A main attendant seat, positioned as per paragraph 3.7.12(b), that **shall**:
  - i. Be a hospital-grade, leatherette padded water-proof seat with a high back and head rest equipped with a retractable three-point seatbelt;
  - ii. Be horizontally and vertically adjustable without having to move from a seating position; and
  - iii. Pivot 180°. The seat **shall** be lockable at every 45 degree increment.
- c. A squad bench, position as per paragraph 3.7.9(c) that **shall**:
  - i. Be secured with piano hinges;
  - ii. Have sufficient pneumatic hold open device(s) to support the bench in the open position and one or more latches to hold the bench in the closed position;
  - iii. Have seating positions for three passengers;
  - iv. Each seating position **shall** have hospital grade, leatherette padded water proof seat cushion, back cushion and headrest;
  - v. Each seating position **shall** include a seat belt;
  - vi. Have the manufacturer's standard net or vertical bolster at the front of the squad bench for protection of passengers in the event of a rapid deceleration meeting CMVSS standard;
  - vii. Have two sets of non-retracting type seatbelts to secure a patient on a T3 Light Weight Assault Litter to the squad bench. The belts **shall** be long enough to pass over the patient and stretcher.

#### **3.7.14. Oxygen System**

The ambulance **shall** have a hospital type piped oxygen system rated to store and supply medical oxygen. The system **shall** include:

- a. Storage/securement as per paragraphs 3.7.9(a) and 3.7.f0(f);
- b. Two oxygen medical gas recessed outlets such as MEDAES model #2417806 D.I.S.S. III which **shall** be located:
  - i. On the action wall; and
  - ii. Near the top of the curb-side wall, located above the head of the forward bench seat.
- c. Colour coding of all components to indicate oxygen; and
- d. Safety protection for both outlets from impact such as a cover for when not in use.

### 3.7.15. Suction Aspiration System

The ambulance shall be equipped with an electrically powered suction aspiration system which shall:

- a. Be portable;
- b. Be colour coded to indicate suction and labelled with the manufacturer's name and any applicable standard ratings;
- c. Be equipped with a suction outlet with a variable speed switch and a vacuum gauge;
- d. Be connected to a reusable collection jar of a minimum of 1200 mL (40.6 US fluid oz) which uses disposable collection bags; and
- e. Have an electric vacuum pump powered by 12 VDC either through the ambulance on-board system (when plugged in) or by rechargeable batteries when disconnected;

### 3.8. Accessories supplied by Contractor

The following ambulance accessories shall<sup>(E)</sup> be supplied by the Contractor:

- a. CPR Board - One CPR board;
- b. Backboards - Two Laerdal BaXstrap or equivalent backboards with attached straps and head beds;
- c. Clock - One battery operated analog or digital clock that displays seconds mounted as per paragraph 3.7.10(b);
- d. Tire Changing Tools - All tools required for changing tires and a heavy-duty jack with sufficient force to lift the loaded vehicle;
- e. Extrication Tools - Extrication tools including at least: an extrication combination tool, a pry bar, bolt cutters, and a tool pouch;
- f. Waste Containers - Two containers of a minimum capacity of 5 L (1.32 US gal), one approved for waste disposal and the other for hazardous waste disposal. The containers shall be mounted as per paragraph 3.7.10(c);
- g. Sharps Containers - One sharps container of with a safety design such as Becton Dickinson #367201 "Vacutainer", mounted as per paragraph 3.7.10(c);
- h. Fire Extinguishers - Two 2.3 kg (5 lb) ULC approved and rechargeable fire extinguishers with a minimum rating of 3A10BC equipped with a pressure gauge and service inspection tag, and the ambulance body bracket (paragraph 3.7.9(h));
- i. Road Flares - Four 20-minute type spiked red warning highway flares in a red, cylindrical screw top flare case mounted as per paragraph 3.7.9(f);

- j. Aspiration Collection Bags - 10 disposable collection bags for the collection jar of the suction aspiration system as per paragraph 3.7.15;
- k. Defibrillator and Platform - A Zoll M-series automatic external defibrillator and swivel platform for the defibrillator unit that is mounted in the action area;
- l. Safety Netting - Removable, heavy duty safety netting mounted in front of the squad bench, with mounting points on the floor and roof;
- m. Main Cot - One Stryker MX Pro 3 cot or equivalent;
- n. Spotlight - A portable spotlight with a connector that can be plugged into a 12 volt power socket outlet. The light **shall** be equipped with a trigger-like switch for on/off activation.
- o. IV Warmers - Two (2) IV warmers located in the forward-most upper roadside cabinet on the action wall. The Koolatron system **shall**<sup>(E)</sup> be acceptable.

### **3.9. Controls**

The vehicle **shall** be equipped with the manufacturer's standard controls. In addition, the vehicle **shall** have the following controls:

#### **3.9.1. Cab Controls**

The vehicle cab control panel design **shall** favour the driver as primary user but allow ready access to control functions from the passenger seat. As a minimum, the following controls **shall** be situated in the cab and **shall**<sup>(E)</sup> be located on the control panel unless otherwise indicated:

- a. Cab Map Light Switch - A manually operated switch to activate the map light described in paragraph 3.10.1(e);
- b. Siren Controls - The manufacturer's standard controls for the siren and all of the lights;
- c. Anti-Theft Device Switch - A switch for the system described in paragraph 3.6.4(c);
- d. Backup Alarm Switch - A switch to disable the backup warning signal for silent backing in a hospital area. The switch **shall** reset automatically after a 25 - 35 second delay;
- e. Light Switch - A switch for the rear patient compartment lights;
- f. Spare Switch - At least one spare switch, wired to a spare circuit breaker;
- g. Sure Start Relay - An automatic relay system which allows vehicle starting from the secondary battery when the primary starting battery is drained.

#### **3.9.2. Ambulance Body Controls**

All controls **shall** be recessed or otherwise protected from accidental operation by the attendant's knees or by material on the work surface. The

following controls, as a minimum, **shall** be situated in/on the ambulance body, located on the action wall unless otherwise indicated:

- a. Passenger Door Light Switches - Switches for operating the interior lights and the rear facing floodlights mounted on one of the rear doors and the side passenger door. The switches **shall** reset when the doors are closed;
- b. Light Disable Switch - Single manually operated switch to disable all light sources inside the ambulance body;
- c. Cabinet Light Switch - A switch to control the lighting of all interior and interior/exterior cabinets described in paragraph 3.10.2(f);
- d. Curb-Side Light Switch - A switch for the curb-side bank of interior ceiling lights (paragraph 3.10.2(e)) with settings high/off/low;
- e. Road-Side Light Switch - A switch for the road-side bank of interior ceiling lights (paragraph 3.10.2(e)) with settings high/off/low;
- f. Reading Light Switch - A switch for the attendant's action wall reading light switch (paragraph 3.10.2(g));
- g. Thermostat Control - A thermostat control for the temperature in the ambulance body located on the action wall that **shall**:
  - i. Allow control of the cabin temperature from the range of at least 15 to 23°C (59 to 74 F);
  - ii. Have a timer that allows the thermostat to be set on a seven-day schedule for a minimum seven days in advance; and
  - iii. Have an override switch that turns the heater on, independent of thermostat setting.
- h. Heater Fan Speed Switch - A two-speed switch located on the action wall that operates the heater fan in three settings: high, low and off positions;
- i. Climate Control Selector - A switch to select whether the heater or air conditioner is used;
- j. Paragraph 3.9.2.j, has been removed from the purchase description;
- k. Suction Outlet Speed Switch - A variable speed switch to control the suction outlet as described in paragraph 3.7.15(c); and
- l. Spare Switch - At least one spare switch, wired to a spare circuit breaker;

### **3.9.3. Instruments**

The vehicle cab instruments **shall** be readily visible to the driver. Instrument lamps **shall**<sup>(E)</sup> have a dimming capability. The following cab instruments, as a minimum **shall**<sup>(E)</sup> be provided:

- a. Tachometer - A tachometer;

- b. Odometer - A metric odometer and speedometer;
- c. Temperature Gauge - A gauge to measure coolant temperature;
- d. Pressure Gauge - A gauge to measure oil pressure;
- e. Voltmeter(s) - One or several voltmeters to monitor the voltage of the OEM and the conversion batteries.
- f. Ammeter - An ammeter connected to the alternator output to monitor the total charging system load.

### **3.10. Lighting**

The vehicle shall be supplied with the manufacturer's standard lighting, using LED lights where applicable. The lighting shall include as a minimum:

#### **3.10.1. Cab Lighting**

The cab of the vehicle shall<sup>(E)</sup> be equipped with, as a minimum, the following lights:

- a. Headlights - Heavy duty OEM standard headlights;
- b. Turn, Hazard and Clearance - The manufacturer's standard turn, hazard and clearance lights, LED if available;
- c. Fog Lamp / Driving Light - Lights recessed into the front bumper and mounted on each side of the vehicle to provide illumination to the area directly to the front;
- d. Dome Light - Manufacturer's standard dome light for general illumination;
- e. Map Light - A goose-neck style map light for illumination of paperwork held by the passenger in the cab.

#### **3.10.2. Ambulance Body Lighting**

The ambulance body shall<sup>(E)</sup> be equipped with, as a minimum, the following lights:

- a. Brake/Turn/Tail Lights - Heavy duty LED brake/turn/tail lights, arranged as per the manufacturer's standard;
- b. Backup Lights - Heavy duty LED backup lights, arranged as per the manufacturer's standard;
- c. Clearance Lights - Heavy duty LED clearance lights, in red and amber colours arranged as per the manufacturer's standard;
- d. Side Turn Signals - Turn signals mounted on the side of the ambulance body that operate in conjunction with the tail lights in paragraph 3.10.2(a);
- e. Patient Compartment Lighting - The vehicle shall<sup>(E)</sup> be equipped with white patient compartment LED lighting arranged in two banks, one on either side of the roof centerline, mounted as close to flush as possible. The lights shall<sup>(E)</sup>:

- i. Be operated by two switches in passenger compartment as per paragraph 3.9.2(d) and (e);
  - ii. Have the road-side bank of patient compartment lighting activated automatically at the low setting when any patient compartment door is opened; and
  - iii. Have the curb-side bank of patient compartment lighting activated by a switch in the cab as per paragraph 3.9.1(e);
- f. Patient Compartment Cabinetry Lighting - Each interior storage cabinet shall<sup>(E)</sup> have at least one LED cabinet light which shall<sup>(E)</sup>:
- i. Be mounted forward in the cabinet so as to not be covered when the cabinet is filled with supplies;
  - ii. Be controlled by a switch in the passenger compartment as per paragraph 3.9.2(c); and
  - iii. Be controlled by door-mounted switches as per paragraph 3.9.2 in all cabinets that are accessible from the interior and exterior of the cab;
- g. Exterior Compartment Lighting - Each exterior storage compartment shall have LED strip lighting; and
- h. Action Wall Reading Light - An LED light for lighting up the action wall. The light shall<sup>(E)</sup> be powered at all times as per paragraph 3.11.53-11-6.

### 3.10.3. Warning Lights

The driver console shall<sup>(E)</sup> contain, as a minimum, the following warning lights:

- a. Door Ajar Light - A flashing red warning light to indicate when any of the patient compartment or exterior storage doors is ajar.
- b. Low Oil Pressure Light - A warning light for low oil pressure;
- c. High Coolant Temperature Light - A warning light for high coolant temperature;

### 3.11. Electrical System

The vehicle shall<sup>(E)</sup> be equipped with the manufacturer's standard electrical system for the cab and ambulance conversion. The vehicle shall be equipped with an isolator that allows all batteries to be charged simultaneously, but does not allow the batteries to draw from each other.

#### 3.11.1. Incubator Receptacles

Two incubator plug-ins, installed in the road-side cabinet wall near the head end of the stretcher rack but not on the action wall shall be provided. The incubator plug-ins shall be:

- a. Flush mounted; and
- b. 12 volt polarized outlets that are powered at all times as per paragraph 3.11.53-11-6.

### **3.11.2. Socket-Type Outlets**

Four 12 volt, polarized socket-type outlets shall be provided. The outlets shall be powered at all times as per paragraph 3.11.53.11.6.

### **3.11.3. Batteries**

The vehicle shall be equipped with the following batteries:

- a. Two (2) standard OEM maintenance free batteries of at least 650 Cold Cranking Amps located in the engine compartment;
- b. Two (2) heavy-duty maintenance free, deep-cycle batteries of at least 900 Cold Cranking Amps located in the ambulance body and labelled "Conversion Battery". Odyssey 65-PC1750 shall<sup>(B)</sup> be acceptable;

### **3.11.4. Alternators**

The vehicle shall be equipped with alternator(s) as supplied as part of the OEM ambulance prep package. Alternator(s) output shall be of sufficient amperage to power all vehicle cab and ambulance body requirements and shall be intended for use on 12 VDC charging systems.

### **3.11.5. Main Conversion Power Switching**

Stopping the engine shall trigger the Automated Electrical Shutdown device, which halts delivery of electricity to the ambulance conversion electrical system. The following items are exceptions and shall continue to be powered when the engine is not running:

- a. Incubator receptacles;
- b. Two-way radio power supply;
- c. Socket-type outlets; and
- d. Action wall reading light.

### **3.11.6. Electrical Control Centre (ECC)**

The Contractor shall provide an electrical control centre that shall<sup>(B)</sup>:

- a. Contain all electrical components;
- b. Be clearly identified, weather-proof and designed for easy access by maintenance personnel; and
- c. Have the location of each device permanently labelled in the ECC (labels on devices which may be replaced during maintenance are not acceptable) as well as an as built electrical diagram on the ECC door or cover that depicts the devices and wiring as located within the ECC.

### **3.12. 110 Volt Shore Power**

The vehicle shall be equipped with a ULC certified 110 Volt AC power system containing the following components.

### **3.12.1. Inverter**

A 12 VDC to 110 volt AC inverter with a minimum power of 1500 watts shall be installed. The inverter shall operate when the engine is running and automatically disconnect when the shore power outlet is energized.

### **3.12.2. Power Supply Inlet**

A Kussmaul auto-eject, ground fault interrupt (GFI) protected 110 volt AC external shore power supply inlet with yellow cover shall<sup>(E)</sup> be provided for use when the vehicle is parked and can be plugged into a power supply. The shore power supply shall be the preferred supply and the interior outlets shall be switched over to the shore power supply when it is energized. The system shall be configured to provide constant power to the 110 volt outlets.

### **3.12.3. Block Heater**

The vehicle shall be provided with a 110 volt block heater with a minimum capacity of 1000 watts.

### **3.12.4. Interior Outlets**

Four GFI protected duplex outlets shall be identified and mounted in the interior of the ambulance body.

## **3.13. Heating, Ventilation and Air Conditioning**

The Heating, Ventilation and Air Conditioning system (HVAC) shall maintain fresh air conditions and a comfortable temperature level in the patient compartment. The HVAC system shall have the capacity to completely change the ambient air within the vehicle every 2.5 minutes when stationary.

### **3.13.1. Cab HVAC**

The cab area of the vehicle shall be equipped with the manufacturer's standard heating and air conditioning system and temperature controls. The cab HVAC and controls shall be completely separate from those in the ambulance body.

### **3.13.2. Ambulance Body HVAC**

The ambulance body shall be equipped with an HVAC system that shall:

- a. Meet the requirements of the Ontario Provincial Land Ambulance and Emergency Response Vehicle Standard for ambulance body HVAC;
- b. Be designed so that when power to the ambulance conversion electrical system is turned on (at start up or when shore power is energized), the heating and cooling functions will return to the last settings in use when the power was turned off;
- c. Have a thermostat control and a high-low-off fan control located on the action wall as per paragraph 3.9.2(g) and 3.9.2(h);
- d. Be of high volume capacity with low velocity delivery for minimum draft circulation; and
- e. Be designed to operate using both re-circulated and ambient air. Ambient air shall<sup>(E)</sup> be filtered with a HEPA filter before it is circulated.

### **3.13.3. Supplemental Ambulance Body Heating**

The ambulance body shall be equipped with supplementary heating systems as follows:

#### **3.13.3.1. Fuel Heater**

The ambulance body **shall** be equipped with an auxiliary heater for the vehicle that **shall**:

- a. Be diesel fuelled;
- b. Be connected to the vehicle's fuel source;
- c. Be controlled by the thermostat control switch (paragraph 3.9.2(g); and
- d. Have sufficient capacity to keep the ambulance body within the operating conditions described in paragraph 3.13.2.
- e. Espar® or Webasto® shall<sup>(B)</sup> be acceptable.

#### **3.14. Paint, Colours and Finishes**

The cab, chassis and ambulance body **shall** be provided with a high quality paint finish in accordance with the paint manufacturer's recommendations. Details of the decals will be finalized at the pre-production meeting. The following applies:

- a. The manufacturer **shall** provide warranty against peeling, cracking, blistering, corrosion and UV paint fade; and
- b. The cab and body exterior **shall** have no mounted components prior to painting to assure full coverage.

##### **3.14.1. Paint Colour**

White **shall** be applied on all exposed exterior surfaces normally painted for commercial trade.

##### **3.14.2. Interior Colours**

The interior colours **shall** be of manufacturer standard of shades of grey and/or blue.

#### **3.15. Decaling Package**

The vehicle **shall** be provided with a custom decaling package consisting of the following:

- a. The Canadian Forces (CF) Base identifier/crest as large as practical **shall** be affixed to the cab doors;
- b. In an arched format above the CF crest, a Base identifier as large as practical **shall** be provided in bilingual format;
- c. The lower rear compartment door as large as practical **shall** be provided with a decal indicating "911";
- d. Reflective striping **shall** be provided on the left and right side of the vehicle in accordance with the applicable provincial standard for the delivery destination;
- e. A Canadian Maple leaf decal as large as practical **shall** be provided on the left and right rear section of the cab, sized IAW design limitations;

- f. A Star of Life decal as large as practical shall be provided on the left and right rear section of the cab, sized IAW design limitations;
- g. The word "AMBULANCE" as large as practical shall be provided in mirrored text on the hood section; and
- h. Details of the decaling package will be finalized at the pre-production meeting.

### **3.16. Identification**

The following information shall be permanently marked in a conspicuous and protected location:

- a. Manufacturer's name, model year and serial number;
- b. GVWR rating;
- c. GAWR; and
- d. Payload.

### **3.17. Warning and Instruction Plates**

The vehicle shall be equipped with:

- a. Signage - Signage and warnings in accordance with industry standards for a patient transfer vehicle. Signs shall be bilingual (English and French) with equal sized lettering or in international symbols; and
- b. Safety Strips - Reflective safety strips on the ambulance body as per manufacturer's standard.

## **4. VARIANT SPECIFIC REQUIREMENTS**

### **4.1. Type I 4x4 Model**

The type I 4x4 vehicle shall meet all of the requirements outlined in this section.

#### **4.1.1. Vehicle Rating**

The vehicle shall<sup>(E)</sup> have the following nominal ratings when equipped as specified:

- a. The GVWR and GAWR of the truck of at least that equal to the curb weight of the completed vehicle with the product tank full, as published in the manufacturer's literature and engineering data; and
- b. Payload of at least 907 kg (2000 lb).

#### **4.1.2. Ambulance Body and Dimensions**

The ambulance body shall<sup>(E)</sup> have the following nominal dimensions:

- a. Exterior Body Length (BL) of 4,318 mm (170 in);
- b. Exterior Body Width (BW) of 2,413 mm (95 in); and
- c. Body Interior Height (BIH) of 1,829 mm (72 in).

#### **4.1.3. Adjustable Air Ride Suspension**

The vehicle rear axle shall be equipped with an air suspension system to allow lowering of the vehicle by a switch in order to facilitate loading the main cot. The switch shall be at the interior rear of the ambulance body (final configuration of the switch will be determined at the pre-production meeting).

#### **4.1.4. Transfer Case**

The transfer case shall<sup>(E)</sup> be a two-speed transfer case activated by an electric push button system that has the following modes:

- a. Two wheel drive, high range;
- b. Four wheel drive, high range; and
- c. Four wheel drive, low range.

#### **4.2. Type III 4x2 Model**

The type III 4x2 vehicle shall meet all of the requirements outlined in this section.

##### **4.2.1. Vehicle Rating**

The vehicle shall<sup>(E)</sup> have the following ratings when equipped as specified:

- a. The GVWR and GAWR of the truck of at least that equal to the curb weight of the completed vehicle with the product tank full, as published in the manufacturer's literature and engineering data; and
- b. Payload of at least 907 kg (2000 lb).

##### **4.2.2. Ambulance Body Dimensions**

The ambulance body shall be fully integrated with the cab and shall<sup>(E)</sup> have the following nominal dimensions:

- a. Exterior Body Length (BL) of 4,318 mm (170 in);
- b. Exterior Body Width (BW) of 2,413 mm (95 in); and
- c. Body Interior Height (BIH) of 1,829 mm (72 in).

#### **5. INTEGRATED LOGISTICS SUPPORT**

The Contractor is required to ensure that spare parts required to properly maintain and repair the vehicle are available for purchase for a period of 10 years.

##### **5.1. Documentation and Support Items**

DND will have the right to translate, copy, and reproduce the documentation specified in this section. The Contractor shall provide the following documentation and support items:

###### **5.1.1. Items with Each Vehicle**

The Contractor shall provide the following items with each vehicle:

- a. Line Setting Ticket - One copy of the chassis manufacturer's line setting ticket, or equivalent, describing the components provided on the cab and chassis shall be provided to the Technical Authority. One copy shall accompany the vehicle to the final delivery point;

b. **Vehicle Manuals** - The vehicle **shall** be provided with all manuals required for the safe operation, maintenance and repair of the vehicle and all sub-systems Manuals required for safe operation, maintenance and repair of the vehicle. The Contractor **shall** provide one (1) complete set of manuals to each destination consisting of items i) through iv) with items i) through iii) in paper format. In addition, each vehicle shall be shipped with the Operator's Manual. It is preferred that complete sets of manuals are provided on CD/DVD-ROM (without password(s), special installation requirements or requiring an Internet connection). The Vehicle Manuals **shall** include:

i. **Operator's Manuals** - Operator's manuals **shall** be in a bilingual format or as 2 manuals in a single binder (one English, one French). The operator's manual **shall** be supplied in paper format with each vehicle. The operator's manual **shall** contain the following information:

1. Instructions for the safe operation of the vehicle;
2. Daily operator maintenance instructions/checks (including lubrication);
3. Safety Warnings; and
4. Hand signals (as necessary).

ii. **Parts Manuals** - The Parts Manuals **shall** be in English. The Parts Manuals **shall** contain the following information:

1. Illustrations showing all the components of the vehicle including Equipment and accessories from other manufacturers that is supplied against the requirements of the contract. The illustrations **shall** have item numbers identifying the parts;
2. A listing for all itemized parts showing the item number, manufacturer's part numbers, the part name and a brief description of the item; and
3. Cross reference relating manufacturer part number to the correct figure and item number and to the part number of the original component manufacturer and that manufacturer's code number (NCAGE).

iii. **Maintenance (Shop Repair) Manuals** - The Maintenance (Shop Repair) Manual **shall** be in English. The Maintenance (Shop Repair) Manuals **shall** include:

1. A trouble shooting guide, showing the steps and tests required to determine the exact cause of a problem and an explanation of what steps would be required to correct a problem;
2. A listing of the necessary tolerances, torque levels, fluid volumes required and a section listing any special tools (including item part numbers); and

3. Information on the order of disassembly and assembly of the systems and components of the vehicle.

- c. **Warranty** - Manufacturer's standard warranty **shall** be provided including the following minimum warranty coverage; 10 year modular ambulance, 5 year Ambulance conversion, 5 year electrical, 2 year for sub-components, 2 year paint, and standard cab and chassis OEM. A paper copy of the completed bilingual Warranty Letter **shall** be delivered with each vehicle in paper format. Designated warranty providers **shall** honour the warranty letter.

#### 5.1.2. **Documents Provided to Technical Authority**

The Contractor **shall** provide the following documents to the Technical Authority:

- a. **Data Summary** - A bilingual data summary for each make/model/configuration by completing Technical Authority's template with data and a vehicle picture. The Contractor **shall** provide a Data Summary, if possible, before shipment of vehicles;
- b. **Photographs** - Two (2) digital pictures, one left-front three-quarter view, and one right-rear three-quarter view. It is preferred that pictures have an uncluttered background. Pictures **shall** have a size of at least 4 Mega pixels;
- c. **Sample Manuals** - A set of Sample Manuals, including the Operators, Parts and Maintenance Manuals, **shall** be delivered to the Technical Authority 30 working days before delivery of the first vehicle. Sample manuals will not be returned. The Technical Authority will provide manual approval or comments within 15 days; and
- d. **Warranty Letter** - The Contractor **shall** send a copy of the Warranty Letter, in electronic format, to the Technical Authority for each vehicle, at shipment.
- e. **Safety Recalls and Servicing Data** - The following information is required to be provided to all customer locations, on a continuing basis, throughout the life expectancy of the vehicle or for no less than 15 years:
- i. Safety Recalls; and
  - ii. Manufacturers Technical Service Bulletins or equivalent.

NOTE: This service can be made available as an Internet Service.

- f. **Preventive Maintenance Replacement Parts Kit List** - A list of parts needed to perform preventive maintenance on a vehicle/equipment during the first scheduled preventive maintenance. The list **shall** include additional items recommended by the Original Equipment Manufacturer for review and acceptance by the Technical Authority. The list **shall** include the following elements:
- 1. Part description;
  - 2. Original Equipment Manufacturer Part number;
  - 3. Suggested quantity;

4. Unit cost; and
  5. Be delivered to the Technical Authority for approval and action. The list **shall** be supplied in an editable electronic format, preferably as a spreadsheet.
- g. **Loose Items Documentation** - At the vehicle pre-delivery inspection, the Contractor **shall** supply the Technical Authority with a detailed listing of loose equipment and material that will be shipped with the vehicle. A template will be provided at the pre-production meeting;

## 5.2. **Training**

The Contractor **shall** perform the following bilingual training:

- a. **Training - Maintenance Personnel** - The Contractor **shall** provide a maintenance/repair course. The course **shall** be held for a minimum duration of one (1) day at the delivery destination to provide training of up to four (4) maintenance personnel. Training **shall** be conducted in English or French, dependant upon the delivery destination. The final dates **shall** be arranged with the Technical Authority (TA). After completion of the course the Contractor **shall** have a "PROOF OF MAINTAINER TRAINING" certificate signed by a Crown Representative. The Technical Authority will supply this document in an electronic format. The course curriculum **shall** include:
  - i. Operation and maintenance safety precautions;
  - ii. Preventive maintenance including servicing schedules;
  - iii. Trouble shooting, testing and adjustments; and
  - iv. Special tools and test equipment.
- b. **Training - Operators** - The Contractor **shall** provide an operator course. The course **shall** be given at the delivery destination for a minimum duration of two (2) days to provide training for two separate shifts of up to six (6) DND operators. Training **shall** be conducted in English or French, dependant upon the delivery destination. The final dates **shall** be arranged with the Technical Authority (TA). After completion of the course the Contractor **shall** have a "PROOF OF OPERATOR TRAINING" certificate signed by a Crown Representative for the destination. The Technical Authority will supply this document in an electronic format. The course curriculum **shall** include:
  - i. Safety precautions to be observed while operating and servicing the vehicle;
  - ii. Vehicle/equipment operating characteristics;
  - iii. Vehicle/equipment operating procedures;
  - iv. Pre-operating and pre-shutdown procedures;
  - v. Daily/weekly operator servicing procedures; and
  - vi. A minimum of two (2) hours practical operating experience per operator.

