RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:
Bid Receiving - PWGSC / Réception des soumissions - TPSGC
11 Laurier St. / 11, rue Laurier
Place du Portage, Phase III
Core 0A1 / Noyau 0A1
Gatineau, Québec K1A 0S5
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

Title - Sujet TCP ECC189212 TRUCK FIRE-FIGHTING	
Solicitation No. - N° de l'invitation W8476-133939/A	**Amendment No. - N° modif.** 003
Client Reference No. - N° de référence du client W8476-133939	**Date** 2012-09-14
GETS Reference No. - N° de référence de SEAG PW-$$HP-912-60908	
File No. - N° de dossier hp912.W8476-133939	**CCC No./N° CCC - FMS No./N° VME**
Solicitation Closes - L'invitation prend fin **at - à 02:00 PM** **on - le 2012-09-21**	**Time Zone** **Fuseau horaire** Eastern Daylight Saving Time EDT
F.O.B. - F.A.B. **Plant-Usine:** ☑ **Destination:** ☑ **Other-Autre:** ☐	
Address Enquiries to: - Adresser toutes questions à: Pearson, Neil	**Buyer Id - Id de l'acheteur** hp912
Telephone No. - N° de téléphone (819) 956-3976 ( )	**FAX No. - N° de FAX** (819) 953-2953
Destination - of Goods, Services, and Construction: **Destination - des biens, services et construction:**	

Instructions: See Herein

Instructions: Voir aux présentes

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

This solicitation amendment 003 is raised to amend solicitation, answer questions from bidders, amend Annex "B" Purchase Description, and extend the solicitation closing date.

The closing date is extended to 21 September 2012.

1. At TABLE OF CONTENTS, PART 5 - CERTIFICATIONS;

Delete:

1. Code of Conduct Certifications - Consent to a Criminal Record Verification

Insert:

1. Code of Conduct Certifications - Certifications Required Precedent to Contract Award

2. At TABLE OF CONTENTS, Attachments;

Delete: CONSENT TO A CRIMINAL RECORD VERIFICATION

3. At PART 2 - BIDDER INSTRUCTIONS, 1. Standard Instructions, Clauses and Conditions

Delete:

Subsection 4 of Section 01 - Code of Conduct and Certifications of the 2003 **(2012-07-11)** Standard Instructions - Goods or Services - Competitive Requirements

Insert:

Subsection 4 of Section 01 - Code of Conduct and Certifications of 2003 (2012-07-11) Standard Instructions as follows:

Bidders should provide, with their bid or promptly thereafter, a complete list of names of all individuals who are currently directors of the Bidder. If such a list has not been received by the time the evaluation of bids is completed, Canada will inform the Bidder of a time frame within which to provide the information. Failure to provide such a list within the required time frame will render the bid non-responsive. Bidders must always submit the list of directors before contract award.

Canada may, at any time, request that a Bidder provide properly completed and Signed Consent Forms (Consent to a Criminal Record Verification form - PWGSC-TPSGC 229)

for any or all individuals named in the aforementioned list within a specified delay. Failure to provide such Consent Forms within the delay will result in the bid being declared non-responsive.

The text under Subsection 5 of Section 01 - Code of Conduct and Certifications of 2003 referenced above is replaced by:

The Bidder must diligently maintain the list up-to-date by informing Canada in writing of any change occurring during the validity period of the bid, and must also provide Canada, when requested, with the corresponding Consent Forms. The Bidder will also be required to diligently maintain the list and when requested, provide Consent Forms during the period of any contract arising from this bid solicitation.

4. At PART 5 - CERTIFICATIONS;

Delete:

1. Code of Conduct Certifications - Consent to a Criminal Record Verification

1.1 Bidders must submit with their bid, by the bid solicitation closing date:

(a) a complete list of names of all individuals who are currently directors of the Bidder;

(b) a properly completed and signed form Consent to a Criminal Record Verification (PWGSC-TPSGC 229), for each individual named in the list.

Insert:

1. Code of Conduct Certifications - Certifications Required Precedent to Contract Award

1.1 Bidders should provide, with their bids or promptly thereafter, a complete list of names of all individuals who are currently directors of the Bidder. If such a list has not been received by the time the evaluation of bids is completed, the Contracting Authority will inform the Bidder of a time frame within which to provide the information. Bidders must submit the list of directors before contract award, failure to provide such a list within the required time frame will render the bid non-responsive.

The Contracting Authority may, at any time, request that a Bidder provide properly completed and Signed Consent Forms (Consent to a Criminal Record

Verification form - PWGSC-TPSGC 229) for any or all individuals named in the aforementioned list within a specified delay. Failure to provide such Consent Forms within the delay will result in the bid being declared non-responsive.

5. At PART 6 - RESULTING CONTRACT CLAUSES, 3.1 General Conditions

Delete:

Subsection 4 of Section 29 of the **2010A (2012-07-16)** General Conditions - Goods.

Insert:

Subsection 4 of Section 29 - Code of Conduct and Certifications of 2010A (2012-07-16) General Conditions - Goods as follows:

During the entire period of the Contract, the Contractor must diligently update, by written notice to the Contracting Authority, the list of names of all individuals who are directors of the Contractor whenever there is a change. As well, whenever requested by Canada, the Contractor must provide the corresponding Consent Forms.

6. Questions from Bidders;

Question 1
Page 19, Section 4.8. Cold Weather Starting Aid. According to our Engineering department, a Cold Weather Starting Aid is not available due to the 2010 emission requirements. Please remove reference for this item from specification. We have attached documentation from Cummins to support the unavailability of Ether injection.

Answer:
Section 4.8 Cold Weather Starting Aid was revised, see updated Purchase Description

---

Question 2.
Page 55, Section 8.3.1. Two (2) electric cord reels shall be provided with 200 feet of 12/3 SO safety yellow cord. According the National Electric Code Standards a cord reel that is 200ft with a 20A circuit shall be 10/3 wire. Please change the requirement to meet these standards.
Two (2) electric cord reels with 200 feet of 12/3 SO safety yellow cord shall (E) be provided preferably in compartment R 3.

Answer:
Section 8.3.1 was revised, see updated Purchase Description

Question 3.
Page 70, Section 9.34.7. The pump shall be rated to provide a minimum output of 7000 L/min (2000 US GPM) at 150 psi. Per section 1.1.1 the pump rating is specified as 8000 L/min, please clarify which rating is the requirement, 7,000 L/min is the equivalent of 1,750 GPM and 8,000 L/min is the equivalent of 2,000 GPM.

Answer:
Section 9.34.7 was revised, see updated Purchase Description

Question 4.
Page 82, Section 11.6.3. Each tank should have the capacity to support a full load of water. Please specify what gallon capacity you would like each foam tank to be, "A" and "B" foam.

Answer:
Section 11.6.3 was revised, see updated Purchase Description

Question 5.
Page 82, Section 11.7.1. A "T" shaped 1,000-US gallon booster tank constructed of ½-inch black UV stabilized copolymer polypropylene shall be provided. Per section 1.1.1 the booster tank capacity is specified as 3,028 Litre (800 IG) Booster Tank, please clarify which booster tank capacity is the requirement, 1,000 or 800 US gallons?

Answer:
Section 1.1.1 & 11.7.1 revised, see updated Purchase Description

---

Question 6.
Also on the French version the engine HP is different, the English version is 380 hp and the French version is 330 hp?

Answer:
Correction made on the French Purchase Description to read 380 Horsepower

---

Question 7:
on item 11.4.1 you request test kit ?

Answer 7:
yes, or an equivalent integrated or separate proportioning system which is capable of calibrating and testing itself without using foam concentrate.

Question 8:
on the foam Pro system you request (11.1) there is a calibration
mode using water to do calibration does meet your requirement 11.4.1?

Answer 8:
If no foam is discharged in the test and calibration procedure and meets all the other specified items in the purchase description, it would be assessed as a substitute/alternative.

Question 9:
there is no other option from foam pro ?

Answer 9:
If the bidder chooses to select another proportioning system and foam distribution test kit, the substitute will be assessed in accordance with Annex B, Para 1.3.1 Substitutes and Alternatives.

Question 10:

Section 4.20.6 Suspension and Axles requires a front axle of 18,000 lbs On the last units for M338 CFB Halifax we were within 177 lbs of being overloaded on the front axle. We have since upgraded the axles on M385 CFB Suffield, M386 CFB Valcartier, M40 CFB Borden and M341 CFB Petawawa to 20,000 lbs at no charge to DND. We would suggest DND change their purchase requirements for this bid to 20,000 lbs to make sure the axle weight rating is not exceeded.

Answer:
Specification Item 4.20.6 amended.

Question 11:
Page 30, Section 5.5.2. The raised roof shall extend from the back of the cab to the center of the front doors to provide additional headroom for the driver and officer. Please allow for the raised roof to be slightly rearward of driver and officer seating area, this will still provide ample room for the pump panel operator's area and rear cab seating to have additional headroom.

Answer:
Specification item 5.5.2 amended

Question 12:
Also on the French version the engine HP is different, the English version is 380 hp and the French version is 330 hp?

Answer:
Correction made on the French Purchase Description to read 380 Horsepower

---

7. Purchase Description Amendment Section 4.17.4:

Delete: 4.17.4 A set of glad hand air brake couplers complete with dummy couplers provided at both the front and rear of the vehicle. The glad hands will be used to activate the braking system when the vehicle is being towed.

Insert: 4.17.4 4.17.4 No longer applicable

---

8. At Annex "B" Purchase Description;

DELETE: Annex "B" Purchase Description dated 06 July 2012
INSERT: Annex "B" Purchase Description dated 14 September 2012

ALL OTHER TERMS AND CONDITIONS REMAIN THE SAME

ANNEX B
14 September 2012

National Défense
Defence nationale

PURCHASE DESCRIPTION AND SPECIFICATION FOR A TRUCK, FIRE-FIGHTING, TRIPLE COMBINATION PUMPER ECC 189212

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

Canada

ANNEX B
14 September 2012

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ANNEX B
14 September 2012

1 GENERAL SPECIFICATION DETAIL

1.1 SCOPE

1.1.1 This document describes the requirement for a Triple Combination Pumper (TCP) with an enclosed Top Mount Operator's Panel with a 3,790 Litre (1,000 USG) Booster Tank and an 8,000 Litre per minute pumping capacity. The apparatus design outlined by this Purchase Description and Specification details the minimum requirements to meet Canadian Forces (CF) Operational requirements for structural fire fighting Operations. The following applies:

1.1.2 The apparatus ***shall*** meet the criteria outlined in CAN/ULC-S515-04 and NFPA 1901 Standards as applicable/detailed.

1.1.3 All items in this Purchase Description and Specification are commercially available. The fact that a manufacturer chooses not to provide a required item does not make this specification proprietary in nature.

1.1.4 The intent of this Purchase Description and Specification is to describe the minimum requirements applicable to the construction and performance of the apparatus and associated equipment. Apparatus detail and or specifications contained in the chapters, sub paragraphs and Annexes of CAN/ULC-S515-04, and NFPA 1901 as applicable, which although may not be specifically detailed within the DND Specification, remain in effect. The final built apparatus delivered by the Manufacturer ***shall*** adhere to and meet as a minimum the requirements outlined within CAN/ULC-S515-04, and NFPA 1901 as applicable, as well as specific DND requirements outlined within this Purchase Description and Specification.

1.1.5 The apparatus as a completed vehicle ***shall*** be designed to maximize both occupant and operational safety in line with current industry standards.

1.1.6 The cab and chassis ***shall***$^{(E)}$ be manufactured by a single primary OEM.

1.1.7 In the event that the cab and chassis primary OEM provides an incomplete vehicle to a Fire Apparatus Body Manufacturer for final stage manufacturing of the apparatus, the Fire Apparatus Body Manufacturer ***shall*** hold Ministerial Authorization as a Final Stage Manufacturer IAW Transport Canada Regulations.

1.1.8 Fire Apparatus Body Manufacturers/Primary OEMs that provide vehicles from a country of origin other than Canada ***shall*** be responsible for the co-ordination of all import documentation through Transport Canada.

1.2 WELDING CERTIFICATION

Manufacturers/Primary OEMs ***shall*** hold welding certification to one of the following standards:

1.2.1 Canadian Welding Bureau Certified Companies:

1.2.1.1 Bidding companies ***shall*** hold current certification IAW the Canadian Welding Bureau (CWB) standards to a division three (3) level IAWCSA W47.1 and CSA W47.2.

1.2.1.2 Individual welders of a bidding company ***shall*** hold current CWB qualifications IAWCSA W47.1 and CSA W47.2 regulations.

1.2.1.3 Bid submissions ***shall*** include a letter of Validation from the CWB demonstrating their current certification of the company and their personnel. Failure to include this documentation ***shall*** render the bid submission as non-compliant.

1.2.2 American Welding Society Certified Companies:

1.2.2.1 Bidding companies ***shall*** hold current certification IAW the American Welding Society (AWS) as a Welding Fabricator IAW AWS B5.17.

1.2.2.2 Individual welders of a bidding company ***shall*** hold current AWS qualifications for D1.1, D1.2 and D1.3 regulations.

1.2.2.3 Bid submissions ***shall*** include a letter of Validation from the AWS demonstrating their current certification of the company and their personnel. Failure to include this documentation ***shall*** render the bid submission as non-compliant.

1.3 INSTRUCTIONS

The following instructions apply to this Purchase Description:

1.3.1 Substitutes and Alternatives

Bidders may propose substitutes and alternatives where " ***shall*** $^{(E)}$" is indicated in the technical requirement description (Purchase Description/Statement of Requirement/Statement of Work).

1.3.1.1 Substitutes and alternatives that are equivalent in form, fit, function and performance will be considered for acceptance by the Technical Authority where the Bidder:

(a) Clearly identifies a substitute and/or an alternative;

(b) Designates the brand name, model and/or part number of the substitute and/or of the product, where applicable;

(c) States that the substitute product is fully interchangeable with the item specified in the technical requirement description;

(d) Provides complete specifications and brochures, where applicable;

(e) Provides compliance statements that include technical details showing the substitute and/or the alternative meet all technical requirements specified in the technical requirement description; and

(f) Clearly identifies those areas in the technical requirement description and in the brochures that support the substitute and/or the alternative compliance with the technical requirements.

1.3.1.2 Substitutes and alternatives offered as equivalent in form, fit, function and performance will not be considered for acceptance by the Technical Authority if:

(a) The bid fails to provide all of the information requested to allow the Technical Authority to fully evaluate the evaluate the equivalency; or

(b) The substitute and/or the alternative fail to meet or fail to exceed the technical requirements specified in the technical requirement description.

1.3.1.3 In conducting the evaluation of bids, Canada may, but will have no obligation to request the bidder offering a substitute and/or an alternative, to provide a copy of the alternative standard and to demonstrate, at the bidder's sole cost, that it is equivalent to the technical requirement.

1.3.2 Mandatory requirements are identified by the word ***shall***. Deviations will not be permitted.

1.3.3 Requirements identified by **" *shall*$^{(E)}$ " *shall*** be satisfied, however, the Technical Authority will consider alternative means for acceptance as a Technical Authority Approved Equivalent IAW the following:

1.3.4 In this document "provided" ***shall*** mean "provided and installed".

1.3.5 When a specific brand name is specified, the intent of the specification detail is to set parameters of form, fit, function or performance. It is the bidder's sole responsibility to provide the required or requested documentation to substantiate an equivalency to the specified requirement. Failure by the bidder to meet the conditions of this requirement will render the bid submission as non-compliant.

1.3.6 Where equipment certification to a standard (SAE or other) is required, the bidder ***shall*** provide the certification upon request.

1.4 DEFINITIONS

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

1.4.1 Quality Assurance Representative - The government official responsible for ensuring that quality systems, material and services supplied by the contractor conform to the specified requirements.

1.4.2 Technical Authority - The government official responsible for technical management of this requirement. The Technical Authority is the Director Support Vehicles Program Management 4-2 (DSVPM 4-2).

1.4.3 Technical Authority Approved Equivalent - Means a feature, or component, which has been evaluated by the Technical Authority and determined to meet the specification requirements for form, fit, function and performance, as applicable.

1.4.4 TCP, Vehicle or Apparatus - Means the complete, self-contained Apparatus, including stowage items, tools, ancillary equipment, expendable liquids and agents, necessary to fulfill the primary mission/function that the vehicle was specifically designed for.

1.5 TECHNICAL INFORMATION APPENDIX

The following applies:

1.5.1 The bidder ***shall*** complete a Technical Information Questionnaire Appendix 1 to ANNEX B in support of their bid submission. Failure to provide any requested brochures, performance analysis, drawings, curves or tables may render the proposal non-compliant.

1.5.2 A nil response to a technical information question may be considered non-compliant. Any deviation from the Purchase Description ***shall*** be listed and explained in detail in the Conformance Certificate APPENDIX 1 to ANNEX B.

1.6 EXCEPTIONS

The following applies:

1.6.1 The Certificate of Conformance takes precedence over all other technical data submitted by a Manufacturer. ***Shall*** a Manufacturer intend to offer an alternate apparatus system, sub-system, component, item or product other than that specified within this Purchase Description and Specification, it ***shall*** be the Manufacturers responsibility to specifically detail the alternative being offered on the Certificate of Conformance. ***Shall*** no alternate apparatus systems, subsystems, components, items or products be identified within the Certificate of Conformance, the Manufacturer ***shall*** provide an apparatus that fully meets the requirements of the Purchase Description and Specification in it's entirety without exception.

1.6.2 Should a bidder identify a specification error, omission, or inconsistency, the item ***shall*** be identified and brought to the attention of the PWGSC Contracting Officer during the RFP process. Errors, omissions or inconsistencies ***shall*** be recorded on the Certificate of Conformance and a proposal ***shall*** be put forward by the bidder to meet the intent of the specification.

2 WARRANTY PROVISIONS

2.1 SINGLE SOURCE WARRANTY

Fire Fighting Apparatus are defined by DND as Mission Critical Support Vehicles. The prime function of the apparatus is to provide fire protection for Federal Government infrastructure, personnel and equipment in support of DND Operations. DND's ability to immediately acquire warranty repair, parts or servicing for Fire Fighting apparatus is an essential component of DND's ability to support Operations. To ensure that Operational delay is minimized when Fire Fighting apparatus are demobilized as a result of mechanical failure, the contractor ***shall*** supply with their bid submission a Warranty Certification letter indicating their acceptance and compliance with the following:

2.1.1 To eliminate divided warranty responsibilities, which would lead to delay in both acquisition of parts and or warranty coverage, the contractor ***shall*** supply a signed single/sole source warranty for the apparatus cab, chassis, body, sub-systems and components prior to vehicle delivery. The letter ***shall*** also be included in the vehicle file at the time of delivery.

2.1.2 The ability to supply spare parts for the expected life of the apparatus (15 years).

2.1.3 Initiate on site warranty repair within a maximum of 72 hours following receipt of notification by DND that the vehicle is unserviceable. All costs associated with on site warranty repair ***shall*** be the sole responsibility of the contractor through out the warranty period.

2.1.4 When repairs are considered by DND to be of a minor nature during the warranty period, alternate repair agreements may be initiated between the holding CF Base and contractor. Warranty repair initiated under this arrangement ***shall*** be a DND initiated procedure and the cost of transport insurance, components, labour and shipment of both replacement parts and return of core items to the Base of origin and return to the OEM from the Base of origin ***shall*** be borne solely by the contractor. When repairs are initiated under this agreement DND ***shall*** be reimbursed at a flat hour labour rate of $103.91 per hour.

2.1.5 Should warranty repair require the movement of the entire apparatus or subcomponents of the apparatus to the contractor's location, all costs associated with transportation and insurance ***shall*** be borne solely by the contractor. This provision ***shall*** cover movement of the apparatus or sub components of the apparatus from the DND location of origin and back to the DND location of origin and as applicable ***shall*** include all costs associated with the return of core components. This condition ***shall*** be in effect throughout the 2-year warranty period.

2.1.6 Should the apparatus be deployed outside of Canada the provision of replacement parts ***shall*** be initiated within a 72-hour time frame. Adherence to this requirement is considered as meeting warranty compliance.

2.1.7 In the event that the apparatus requires mechanical repair and the location of the apparatus is outside of Canada, the contractor ***shall*** have the ability at their discretion to decline on site repair. If this option is chosen the contractor will reimburse DND the flat rate repair cost at an hourly rate of $103.91, plus the cost of all consumable items used to perform the repair. Under this arrangement transportation costs for all parts from the supplier's location to the DND location, as well as costs associated with the return of core items ***shall*** be borne solely by the contractor.

2.2 WARRANTY DURATION

The bidder ***shall*** supply a full a 100 percent "**bumper to bumper**" warranty for a two-year period, with the exception of consumable items. . Warranty coverage ***shall*** commence on the first day following familiarization training. Consumable items will be maintained by DND. Items identified as consumables follow:

2.2.1 Tires.

2.2.2 Batteries.

2.2.3 Hoses.

2.2.4 Belts.

2.2.5 Bulbs.

2.2.6 Wiper blades.

2.2.7 Filters.

2.2.8 Oils.

2.3 COMPONENT WARRANTY

The following applies:

2.3.1 Component parts are identified as all parts used in the manufacturing of the apparatus which are not listed as consumables IAW Specification Item 2.2. The main apparatus assemblies; cab, chassis, frame, body and fire package plumbing are not considered as component parts, warranty detail specific to these assemblies is covered as a separate item.

2.3.2 Component parts that do not have an OEM two-year warranty ***shall*** be the responsibility of the manufacturer to repair or replace within the warranty period defined at paragraph 2.2. All costs associated with the repair and or replacement ***shall*** be the responsibility of the manufacturer.

2.3.3 DND will initiate warranty procedure through contact with the manufacturer. Sole responsibility to coordinate and resolve all warranty repairs with component suppliers during the two-year warranty period is the responsibility of the manufacturer.

2.3.4 Provision ***shall*** be made by the manufacturer to transfer individual component warranties that transcend the two-year OEM warranty period to DND.

2.4 FRAME WARRANTY

The apparatus manufacturer ***shall*** provide a lifetime frame warranty, the following applies:

2.4.1 The warranty ***shall*** cover the removal, replacement or repair of the main frame, and cross members that fail within the warranty period due to defects in material and or workmanship including rusting conditions which

lead to frame degradation that results in an inability of the frame to function as designed.

2.5 CAB AND BODY STRUCTURE WARRANTY

The apparatus ***shall*** be provided with a cab and body structural warranty as follows:

2.5.1 The warranty ***shall*** be in effect for a 10 year period or 100,000 km.

2.5.2 The warranty ***shall*** cover the removal, replacement or repair of all cab and body structural components that fail within the warranty period due to defects in material, workmanship or as a result of perforation with the exclusion of hardware, electrical and mechanical items attached to the cab and or body structure.

2.6 STAINLESS STEEL PLUMBING WARRANTY

The apparatus ***shall*** be provided with a 10 year stainless steel plumbing component warranty, the following applies:

2.6.1 The warranty ***shall*** cover the removal, replacement or repair of all stainless steel plumbing system components that fail within the warranty period due to defects in workmanship and or material.

2.7 PAINT WARRANTY

The apparatus ***shall*** be provided with a paint warranty, the following applies:

2.7.1 The apparatus ***shall*** be provided with a minimum 5 year warranty covering paint peeling, cracking, blistering and UV fade. Based on the nature of the paint media DND will accept the pro-rating of the apparatus paint warranty over the 5 year duration. As applicable, manufacturers ***shall*** provide details of the pro-rated warranty.

3 APPLICABLE DOCUMENTS AND PUBLICATIONS

The following documents form part of this Purchase Description and Specification. Effective dates are those in effect on the date of manufacture. Source is as shown:

3.1.1 Transport Canada Canadian Motor Vehicle Safety Regulations and Standards

3.1.2 Society of Automotive Engineers Inc. 400 Commonwealth Drive. Warrendale. P A, 15096

3.1.3 Standards Council of Canada, International Standardization Branch 450 O'Connor St. Suite 1200, Ottawa, Ontario, K1P 6N7

3.1.4 Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA, 15036, USA

3.1.5 SAE Handbook

3.1.6 National Fire Prevention Association (NFPA) (International) 479 Atlantic Ave., Boston, Massachusetts, 02110, USA

3.1.7 NFPA 1901

3.1.8 CAN/ULC-S515-04

3.1.9 Tire and Rim Association Inc., 3200 West Market Street, Akron 44313 Ohio, USA

3.1.10 CAN/CGSB 28.74-M90 - Foam Liquid Concentrate, Fire Fighting, Aqueous Film-Forming (AFFF)

3.1.11 ISO 9001 - International Standards for Quality Management

3.1.12 ISO 2575 - Road Vehicles-Symbols of Controls, Indicators and Tell Tales

3.1.13 Canadian Welding Bureau (CWB)

3.1.14 American Welding Society (AWS)

4 REQUIREMENTS

4.1 STANDARD DESIGN

The following applies:

4.1.1 ***Shall*** be manufacturer's latest model year at time of production.

4.1.2 ***Shall*** have demonstrated industry acceptability by having been manufactured, marketed and sold commercially.

4.1.3 ***Shall*** have been proven in service for this application for at least 1 year, or be designed and manufactured by a primary OEM that has at least 5 years of experience in designing and manufacturing TCP apparatus. Objective evidence of experience ***shall*** be provided with the bid submission.

Objective evidence in the form of client references ***shall*** include but not be limited to the following information:

4.1.3.1 Fire Department delivery location.

4.1.3.2 Month and year of apparatus delivery.

4.1.3.3 Water and pump Capacity.

4.1.3.4 Foam Capacity.

4.1.3.5 Point of Contact name and telephone number at delivery location.

4.1.3.6 Apparatus make and model.

4.1.4 ***Shall*** provide OEM certification verifying that power train and major component systems meet the OEM's design standards for the intended use/application.

4.1.5 ***Shall*** conform to all applicable laws, regulations and industry standards governing manufacture, safety, noise levels and pollution in effect in Canada at time of manufacture. The sound level in the cab when measured in accordance with SAE Recommended Practice J 336 ***shall*** not exceed 85-dBA.

4.1.6 System and component capacities ***shall*** not be increased above published ratings.

4.1.7 ***Shall*** include all components, equipment and accessories normally supplied for this application, although they may not be specifically described in the purchase description.

4.2 OPERATING CONDITIONS

The vehicle, under all load conditions, ***shall*** operate as follows without degradation in performance, reliability and maintainability:

4.2.1 The fully equipped vehicle, including payload, ***shall*** be capable of operating on unpaved roads with severe washboard surfaces, mud, snow and ice under all extremes of weather conditions encountered in Canada.

4.2.2 The vehicle ***shall*** be capable of operating in an ambient temperature range of minus -40° C to plus +40° C (-40° F to 118°F). Normal initial cold start will be in an ambient temperature of 18° C (64° F).

4.2.3 The vehicle ***shall*** be designed to operate safely and efficiently at the GVWR specified by the OEM, under all operating conditions.

4.3 VEHICLE SAFETY REGULATIONS

The vehicle ***shall*** meet the standards of the Canada Motor Vehicle Safety Act and the Regulations made there under, in effect on the date of manufacture of the vehicle. Evidence of compliance ***shall*** be provided at time of delivery.

4.4 HUMAN ENGINEERING AND SAFETY

The following applies:

4.4.1 All systems and components ***shall*** be safe and easy to use by a 5-95th percentile male or female under all operating conditions.

4.4.2 Entry and exit points ***shall*** be provided with handles and steps suitably positioned as required by NFPA 1901, to accommodate a 5-95th percentile male or female under all operating conditions.

4.4.3 All rotating or reciprocating parts and all parts subject to high operational temperatures, are electrically energized, or are of such a nature or so located as to be a hazard to the safety of operators and maintenance personnel ***shall*** be insulated, enclosed or guarded.

4.4.4 SAE Grade 5 to 8 fasteners ***shall*** be provided in all areas that require the application of their respective clamp load capabilities. The contractor ***shall*** provide a statement that no sub-standard Class 3 fasteners have been used in safety critical applications, where a fastener failure could cause death, severe injury or system loss. All fasteners (bolts, nuts and washers) used in the water and foam tanks/systems ***shall*** be stainless steel.

4.5 MAINTAINABILITY

All maintenance and repair tasks, especially routine operator maintenance, ***shall*** be easy to perform with a minimum of special tools and skills.

4.6 DIMENSIONS

The apparatus provided ***shall***$^{(E)}$ meet the following nominal dimensions:

4.6.1 Overall Height with ladder rack – 3,251-mm (128-inches).

4.6.2 Overall width - 2,450-mm (100-inches).

4.6.3 Overall apparatus Length including rear step – 10,414 -mm (410-inches).

4.7 ENGINE

The following engine system ***shall*** be provided:

4.7.1 An electronically controlled 4-cycle, turbo charged and after cooled diesel engine rated at a minimum 380 BHP @2200 RPM.

4.7.2 Engine performance and characteristics ***shall*** meet the following standards IAW NFPA 1901, with the engine cooling fan(s) and air conditioning system operating:

4.7.2.1 From a standing start, the apparatus ***shall*** be able to attain a speed of 55 kph (35 mph) within 25 seconds on a level road.

4.7.2.2 The apparatus ***shall*** be able to attain a minimum top speed of 80 kph (50 mph) on a level road.

4.7.2.3 The apparatus ***shall*** be able to maintain a speed of at least 30 kph (20 mph) on any grade up to and including 6 percent.

4.7.2.4 A computer generated performance prediction program based on GVWR such as Allison SCAAN program, or a Technical Authority approved equivalent ***shall(E)*** be provided with the bid submission demonstrating the ability to meet these performance requirements.

4.7.3 An engine high idle control ***shall*** be provided to maintain the engine idle at approximately 1200 RPM when activated. This control ***shall*** be safety interlocked to activate only after the transmission has been placed in the neutral position and parking brake has been set. The fast idle ***shall*** be actuated through a toggle/rocker type switch and be set IAW the engine manufacturer's recommendations.

4.7.4 A remote engine oil drain valve ***shall(E)*** be plumbed into the engine oil pan to allow oil changes from the underside of the engine.

4.7.5 A TurboSafe TEP 3000 two-stage lubricator ***shall(E)*** be provided or Technical Authority approved equivalent.

4.7.6 An emergency engine shutdown device. The system ***shall(E)*** shut off the air supply and prevent the re-starting of the engine without using a special reset procedure. Activation of the engine shut down control ***shall*** be readily accessible from the drivers seated position and labelled to indicate function. No special tools ***shall*** be required to reset the emergency shut down device.

4.7.7 A two stage, severe-service type air cleaner with the first stage self-cleaning and protected from the ingress of snow, rain and water splash from the apparatus tires ***shall*** be provided.

4.7.8 The engine air cleaning system ***shall*** be designed to meet as a minimum the airflow recommendations as specified by the engine OEM. Bid submissions ***shall*** include the engine OEM approval for the air cleaning system proposed.

4.7.9 An in-cab air cleaner restriction indicator ***shall*** be provided.

4.7.10 A fan shroud ***shall*** be provided.

4.8 COLD WEATHER STARTING AID

A cold weather starting aid system ***shall*** be provided in accordance with the engine OEM specification.

4.9 ENGINE COOLANT HEATER

The apparatus ***shall*** be provided with an engine coolant heater system, the following applies:

4.9.1 A 120 Volt coolant heater ***shall*** be provided. The heater ***shall*** have sufficient capacity to maintain the engine at the manufacturer's recommended temperature for rapid starting and immediate high initial engine performance without engine damage. The heater ***shall*** be provided with an automatic thermostatic control to prevent overheating of the coolant.

4.9.2 The coolant heater ***shall*** be wired to shoreline power through a Kussmaul 30 amp super auto-eject AC inlet receptacle. The auto eject receptacle ***shall***$^{(E)}$ be provided at the rear of the apparatus. The male portion of the auto-eject plug ***shall*** be shipped loose with the vehicle. The inlet receptacle ***shall*** be labelled with function and voltage.

4.9.3 The coolant heater ***shall*** be provided with an independent power circuit specific to the coolant heater operation.

4.10 ENGINE COOLING SYSTEMS

The following ***shall*** be provided/applies:

4.10.1 The radiator ***shall*** be certified by the engine OEM for use in the proposed power train design. Bid submissions ***shall*** include OEM certification of radiator capacity to meet design application.

4.10.2 All the coolant and the heater hoses ***shall***$^{(E)}$ be made of a silicone material and secured with constant torque clamps.

4.10.3 ***Shall***$^{(E)}$ be provided with a filter/conditioner with isolation valves to minimize fluid loss when changing filter elements. Filter ***shall*** be a spin on type design.

4.10.4 The coolant system ***shall*** be equipped with a thermal clutch fan, designed to operate within the power train heat range parameters. The fan system chosen by the bidder ***shall*** be certified by the engine OEM for the application.

4.10.5 The system ***shall*** be designed to engage the fan for continuous operation in case of failure to the thermostatic control.

4.10.6 A low-level engine coolant indicator light and buzzer ***shall*** be provided in the cab.

4.10.7 A high engine coolant temperature indicator light and buzzer ***shall*** be provided in the cab.

4.10.8 The apparatus ***shall*** be provided with an anti -freeze solution rated for a minimum of -40°C.

4.11 AUXILIARY ENGINE COOLER

Based on the engine OEM recommendations an auxiliary engine cooler ***shall*** be provided to lower engine water temperature during prolonged pumping operations. If recommended the following ***shall*** be provided:

4.11.1 The cooler ***shall*** be provided with operational controls located at the pump operator’s panel.

4.11.2 The engine cooler ***shall*** be installed in the engine coolant system in such a manner as to allow cool pump water to circulate past, but not through, the engine coolant to remove heat.

4.11.3 The engine coolant and pump water ***shall*** not intermix.

4.11.4 In the event that the engine OEM does not recommend the use of an auxiliary engine cooler, the manufacturer ***shall*** supply OEM documentation verifying the recommendation to the Technical Authority upon request.

4.12 FUEL SYSTEM

The fuel system ***shall*** be based on an injector design and be provided with the following as a minimum:

4.12.1 One (1) mechanical fuel pump.

4.12.2 Provide a check valve in the feed line to prevent fuel from leaking back into the tank when the engine is shut down.

4.12.3 A fuel filter and water separator with a thermostatically controlled heating element ***shall*** be installed. The filtration system design ***shall***$^{(E)}$ be IAW the engine OEMs fuel flow requirements and recommended micron filtration levels.

4.12.4 The filtration system ***shall*** be provided with primary and secondary filtration incorporating isolation valves to minimize fuel loss during element replacement. The filter elements provided ***shall***$^{(E)}$ be of a spin on type design.

4.12.5 A corrosion resistant, aluminized steel fuel tank with a minimum capacity of 246- litres (65-US gals) ***shall*** be provided. The fuel tank filler neck ***shall*** be provided with a strainer and have a minimum opening diameter of 76 mm. A label indicating “Diesel Fuel Only” ***shall*** be provided within a six-inch radius of the filler neck.

4.12.6 The use of galvanized fittings ***shall*** not be permitted in the fuel system. No corrosive parts ***shall*** be used inside the fuel tank.

4.12.7 The fuel tank ***shall*** be mounted so that it will not be damaged by distortion of the chassis and will not be affected by external heat, or heat from the engine or exhaust.

4.12.8 To prevent the possibility of having fuel splashed into the face of a person filling the fuel tank, the filler location ***shall*** not be higher than 145 cm

(58inches) above ground level unless an anti-splash feature is incorporated.

4.12.9 The fuel lines ***shall*** be designed to prevent the accumulation of wax at extreme low temperatures.

4.12.10 A drain plug ***shall*** be provided at the lowest point in the fuel tank.

4.12.11 All required piping, valves, fittings and other accessories necessary to make a complete system ***shall*** be provided.

4.13 ENGINE PRIMING SYSTEM

An electric fuel priming system ***shall*** be provided. The following applies:

4.13.1 Valves and piping ***shall*** be arranged so that the priming system can be operated only to re-prime the fuel system.

4.13.2 When the priming system is not being intentionally operated, it ***shall*** be isolated from the fuel system and inoperable.

4.13.3 The priming system ***shall*** be provided with a label to indicate proper operation.

4.13.4 The pump ***shall*** be provided with the ability to re-prime the vehicle's fuel system after replacement of the fuel filter(s).

4.14 FUEL HEATER

The following ***shall*** be provided:

4.14.1 A thermostatically controlled fuel heater.

4.14.2 The system ***shall*** not heat the fuel above 25ºC (77ºF).

4.15 TRANSMISSION

The transmission ***shall*** be matched to the engine and ***shall*** be certified for the application by the transmission manufacturer. The following ***shall*** be provided/applies:

4.15.1 An electronically controlled, minimum five (5) speed automatic transmission, compatible with the electronically controlled diesel engine.

4.15.2 A transmission oil cooler of sufficient capacity to meet the design recommendations of the transmission OEM. The cooler ***shall*** be certified by the transmission OEM for intended use. Proof of design acceptance ***shall*** be provided with the bid submission.

4.15.3 The transmission/engine ***shall*** be programmed to prohibit the transmission from engaging when the engine fast idle is engaged and the parking brake is applied.

4.15.4 The transmission ***shall*** be equipped with a power lockup device that will prevent down shifting of transmission when engine speed is decreased during pump operations. The lockup ***shall*** be automatically activated when placing pump in gear and automatically deactivated when disengaging pump for normal road operation.

4.16 POWER STEERING

The following ***shall*** be provided/applies:

4.16.1 With a power steering gear and a power assist cylinder(s).

4.16.2 With a tilt and telescopic steering column to accommodate various size operators.

4.16.3 The steering assembly ***shall*** be rated to statically steer up to the maximum front axle load as defined by the Weight Analysis Calculation.

4.16.4 Capable of operating mechanically ***shall*** the hydraulic system fail.

4.16.5 The steering mechanism ***shall*** be capable of turning the front wheels to an angle of at least 30 degrees to either the right or the left.

4.17 AIR BRAKE SYSTEM

A four-channel anti-lock brake (AB S) air brake system that meets the current NFPA 1901 standards ***shall*** be provided, the following applies:

4.17.1 S-Cam type air brakes.

4.17.2 The rear axle equipped with emergency brake chambers.

4.17.3 Automatic slack adjusters.

4.17.4 No longer applicable

4.17.5 Front and rear wheel visual brake stroke indicators.

4.17.6 A pressure-protection valve to prevent use of the air horns or other air-operated devices if the air system pressure drop below 85-psi.

4.17.7 The braking system ***shall*** be provided with a minimum of three (3) air tank reservoirs. One tank as a wet reservoir, one tank dedicated to the front brake system and one tank dedicated to the rear braking system.

4.17.8 The reservoir system ***shall*** be provided with a minimum air storage capacity to provide a brake application pressure which is adequate to stop the apparatus within the braking distances identified in NFPA 1901, Section 4.16.8, after seven (7) full brake applications with the air compressor disabled, and IAW SAE 1609.

4.17.9 A heated automatic moisture-expelling valve at the Air Dryer and all air tanks.

4.17.10 An automatic heated air dryer. The air dryer ***shall***$^{(E)}$ be a Bendix Model AD-9 or as recommended by the OEM.

4.17.11 A 1/4-inch brass quick-release air inlet with a male connection ***shall***$^{(E)}$ be located inside the driver door to allow a shoreline air hose to be connected to the vehicle air system.

4.18 AUXILIARY BRAKE SYSTEM

The following applies:

4.18.1 The apparatus ***shall*** be provided with an auxiliary braking system with either an engine, transmission, driveline or exhaust retarder design.

4.18.2 A function switch(s) ***shall*** be provided in a location that provides easy access to the switches from the drivers seated position.

4.18.3 The driver ***shall*** have the ability to turn the system completely off during inclement weather conditions.

4.19 TIRES AND WHEELS

The following ***shall*** be provided/applies:

4.19.1 The front and rear tires provided ***shall***$^{(E)}$ be Michelin tubeless type steel belted radials. Tire tread ***shall*** be a highway tread pattern for the front wheel assemblies and a mud and snow design for the rear wheel assemblies. Tires ***shall*** be mounted on hub-piloted disc wheels.

4.19.2 The tire and wheel combinations ***shall*** be certified to operate with the weight capacity defined by Weight Analysis at a speed of 100 KPH.

4.19.3 The wheels and tires ***shall*** conform to the Tire and Rim Association requirements.

4.19.4 The disc wheels provided ***shall***$^{(E)}$ be Alcoa hub piloted. The wheels ***shall*** be a one-piece aluminum construction with an outer polished surface. Wheels ***shall*** be certified for the apparatus axle weight loads of the final built vehicle when fully loaded IAW NFPA 1901.

4.19.5 A wheel trim package(s) ***shall***$^{(E)}$ be provided as follows:

4.19.5.1 The front wheels provided with Real Wheels stainless steel lug nut covers and mirror finish stainless steel baby moons.

4.19.5.2 The rear wheels provided with stainless steel lug nut covers and mirror finish stainless steel spring clip band mount high hats.

4.19.5.3 Stainless steel high hats ***shall*** carry a lifetime warranty plus a 2-year rebuffing policy.

4.19.6 A spare tire and wheel assembly for each the front and rear axle ***shall*** be provided with the apparatus at time of delivery. Onboard vehicle spare tire carrier/storage is not required.

4.20 SUSPENSION AND AXLES

The following ***shall*** be provided:

4.20.1 The rear axle equipped with an air suspension system.

4.20.2 Immediate response automatic height control valve(s).

4.20.3 A cab mounted manually operated air dump valve control.

4.20.4 Double acting shock absorbers on all axles.

4.20.5 Automatic traction control or a driver controlled full locking differential.

4.20.6 A front axle capacity as a minimum of 20,000-lbs.

4.20.7 A rear axle capacity as a minimum of (27,000-lbs).

4.21 TOWING EYES

The following ***shall*** be provided:

4.21.1 Stainless steel towing eyes provided at the front and rear of the apparatus mounted directly to frame with grade eight (8) bolts. Towing eyes ***shall*** be of sufficient strength to meet the load requirements (of a fully loaded apparatus) imposed by a direct pull during recovery operations.

4.21.2 Two rail tie down points provided at the mid ship point of the frame. Rail tie down points ***shall*** be of a sufficient strength commensurate with the apparatus GVWR.

4.21.3 Towing eyes and tie down points ***shall*** be provided with a minimum opening diameter of three (3) inches.

4.22 FRAME

The following ***shall*** be provided:

4.22.1 Frame side rails with a C channel design and painted with a black powder coat finish.

4.22.2 Side rails constructed of 110,000-psi minimum yield high strength steel, with a minimum RBM of 1,827,573 inch pounds and sectional modulus of 16.61 cubic inches.

4.22.3 Frame cross member assemblies fully gusseted and installed using grade eight (8) flanged head bolts and flanged locking nuts.

4.23 FRONT BUMPER

The following ***shall*** be provided/applies:

4.23.1 The vehicle equipped with a one-piece 12-inch high bumper, made from 10-gauge polished stainless steel and incorporates two stiffening ribs. The bumper ***shall*** extend out 24-inches from the face of the cab.

4.23.2 The chassis frame extension ***shall***$^{(E)}$ be covered on the top, underside and on each side of the front bumper, with 1/8-inch aluminum diamond plate. The diamond plate covering ***shall*** be designed to provide a smooth finished appearance that blends into the front bumper.

4.23.3 The front bumper provided with upright style guide pole markers. The top of the markers visible from the drivers seated position and provided with lights interfaced with the head lights system.

4.24 EXHAUST SYSTEM

The following ***shall*** be provided:

4.24.1 An under body 4-inch exhaust system that clears the body and is directed away from critical areas such wiring, brake lines, storage areas and mud flaps.

4.24.2 The exhaust system commencing at the manifold constructed from aluminized steel.

4.25 AUTOMATIC GREASING SYSTEM

The apparatus ***shall***$^{(E)}$ be provided with a Groenveld automatic greasing system, the following applies:

4.25.1 The system provided with a 12 volt DC electronically operated gear pump.

4.25.2 The system provided with a grease level indicator switch that provides an alarm signal to the operator when the grease levels falls below a specified level.

4.25.3 The reservoir positioned in a location that provides easy access by the operator for re-fill operations.

4.25.4 The system provided with an electronic timer to control grease cycle intervals. Grease cycle time intervals ***shall*** be adjustable.

4.25.5 The system ***shall*** automatically supply lubrication to all grease points recommended/identified by the cab and chassis OEM.

4.25.6 The manufacturer ***shall*** provide documentation during the pre-delivery inspection confirming that all recommended/identified OEM grease points are being serviced by the automatic greasing system.

5 CAB SYSTEMS

5.1 CAB CRASH WORTHINESS

The following applies:

5.1.1 The cab ***shall*** meet or exceed relevant load and impact tests required for compliance certification with Economic Commission for Europe (ECE) Regulation No. 29, Addendum 28, Revision 1, "Uniform Provisions Concerning the Approval of Vehicles with Regard to the Protection of the Occupants of the Cab of a Commercial Vehicle”.

5.1.2 Third party certification from an independent licensed professional engineer verifying compliance to ECE Regulation No. 29 ***shall*** be provided with the bid submission.

5.2 CAB FEATURES

The following ***shall*** be provided:

5.2.1 A 6-passenger, custom, raised roof, four door, tilt cab. The cab fabricated with all aluminum-welded construction, fully enclosed, with open interior design allowing for easy communication within the cab.

5.2.2 The cab design provided for an enclosed pump panel design.

5.2.3 A Seating Capacity Tag/Plate permanently installed on each entry door of the apparatus, and IAW with current NFPA standards.

5.2.4 The custom tilt cab design ***shall***$^{(E)}$ incorporate extrusion design utilizing a minimum 1/8-inch aluminum alloy sheet for the outer skins, doors and floor(s).

5.2.5 The roof perimeter provided with integral drip rails.

5.2.6 The front corners of the cab provided with a radius design.

5.2.7 Dual interior sun visors.

5.2.8 Interior trim with a fire resistant material.

5.2.9 A console capable of accepting sirens and radio heads. A dual radio hook-up ***shall*** be provided and include all electrical and coax cables, antennae and mounts.

5.2.10 Radio electrical power feed cables provided with fuse protection.

5.2.11 DND will supply the radios as Government Supplied Material for installation at the manufacturer's facility.

5.3 INTERCOM SYSTEM

The following ***shall***$^{(E)}$ be provided/applies:

5.3.1 A Setcom intercom system.

5.3.2 The intercom connected to the radio allowing personnel to listen to the radio and transmit over the intercom.

5.3.3 The driver and turret operators headsets capable of transmitting and receiving over the radio.

5.3.4 The push to talk control mounted to provide easy accessibility to the seated driver and co-driver.

5.3.5 One headset with microphone per crewmember. The headsets equipped with 1.5 m of coiled cord and be of a design that allows for use/able to be worn underneath helmets.

5.3.6 The driver's headset operated through a weatherproof, remote foot operated control switch.

5.3.7 A remote connection with 4.5 m of coiled cord and a chromed hook provided at the pump control panel.

5.4 CAB EXTERIOR

The following applies:

5.4.1 The exterior of the cab ***shall*** be at least 2387 mm (94 inches) wide; approximately 3048 mm (120 inches) long with the cab roof and 2565 mm (101inches) above the ground.

5.4.2 Brushed aluminum fenderettes bolted in wheel well liner ***shall***$^{(E)}$ be provided.

5.4.3 The front air intake grill ***shall***$^{(E)}$ be manufactured from stainless steel, and ***shall*** meet the free air intake requirements recommended by the engine OEM.

5.4.4 The cab windshield(s) ***shall*** be laminated automotive safety glass with a 75% light transmittance automotive tint. Windshield viewing area ***shall*** be a minimum of 2600 square inches.

5.4.5 Windshield design ***shall*** utilize a left and right glass pane.

5.4.6 Stationary side windows located between the front and rear side doors ***shall*** be provided. Side windows ***shall*** be laminated automotive safety glass with a 75% light transmittance automotive tint and provide a minimum viewing area of 400-square inches.

5.4.7 Four, 1¼-inch x 18-inch long cab door assist handrails ***shall*** be provided directly to the rear of the door openings. The handrail ***shall*** be machine extruded with an integral ribbed surface to assure a good grip for personnel

safety and be installed between chrome end stanchions that have a minimum of a 2-inch standoff to allow for access with a gloved hand.

5.5 RAISED CAB ROOF

To provide for adequate cab interior headroom at the enclosed pump panel area, a raised cab roof ***shall*** be provided as follows:

5.5.1 The rear portion of the cab roof raised 20 inches and provides a minimum cab floor to headliner measurement of 72 inches.

5.5.2 No longer applicable

5.5.3 The raised roof ***shall*** be provided with windows around the sides and front of the raised perimeter. Windows ***shall*** be of the maximum size allowable based on the cab design.

5.6 PUMP PANEL HOOD EXTENSION

The following applies:

5.6.1 The cab ***shall*** be provided with a canopy extension to form a pump panel hood. The upper rear portion of the cab ***shall*** include a rear cab wall extension to house the top mount pump panel with approximate dimensions of 96" wide x 23" deep x 27.25" high. The extension ***shall***$^{(E)}$ be fabricated from aluminum. The lower rear wall ***shall*** be provided with a cut out measuring approximately 25" high x 70" wide to allow access to the pump system.

5.6.2 The bustle back section of the cab ***shall***$^{(E)}$ be provided with nine (9) windows, located as follows:

5.6.2.1 Two (2) 16" x 16" windows provided on each side.

5.6.2.2 Three (3) windows provided on the rear wall;

5.6.2.2.1 Two (2) windows ***shall*** be provided at the outer cab corners and measure approximately 16" x 16"; and

5.6.2.2.2.2 One (1) window ***shall*** be provided at the centre section and measure approximately 16" x 41".

5.6.2.3 One (1) 17" X 5" windows provided at the bottom outer edge of the extension facing the ground on each side.

5.6.2.4 Two (2) 30" x 5" windows provided at the outboard edge of the rear cab wall on each side.

5.7 CAB INTERIOR

The following applies:

5.7.1 The interior of the cab ***shall*** be open design, with an ergonomically designed driver area that provides ready access to all controls as well as a clear view of critical instrumentation.

5.7.2 The engine cover between the driver and the officer ***shall*** be a low-rise contoured design. The rear portion of the engine enclosure ***shall***$^{(E)}$ be provided with a lift up access cover to allow for routine maintenance checking and filling of power train fluid levels without raising the cab.

The engine cover ***shall*** be provided with a fire resistant insulation blanket covered with a fire and tear resistant material. The cover finish ***shall*** be the same colour as other interior padding and finishes.

5.7.3 The cab floor(s) ***shall*** be covered with a black rubber floor mat that provides an aggressive slip-resistant surface, and IAW current NFPA 1901.

5.7.4 The minimum vertical dimension from the seat H-point to the ceiling for each belted seating position ***shall*** be as follows:

5.7.4.1 For suspension-style seats with independent height adjustment, the minimum vertical dimension ***shall*** be 940 mm (37 inches) measured with the height adjustment in its lowest position and the suspension inflated and/or raised to the upper limit of its travel.

5.7.4.2 For suspension-style seats without independent height adjustment, the minimum vertical dimension ***shall*** be 940 mm (37 inches) measured with the suspension inflated and/or raised to the upper limit of its travel.

5.7.4.3 For non suspension-style seats, the minimum vertical dimension ***shall*** be 882 mm (35 inches) measured with the seat adjusted to its lowest position.

5.7.5 The dash, console, windshield posts, headliner, door panels, and door post trim ***shall*** be covered with panels providing excellent scuff, abrasion and chemical stain resistance finish. The material ***shall*** comply with Federal Motor Vehicle Safety Standard 302 for flammability of interior materials.

5.7.6 A storage area with a hinged access door ***shall*** be provided below the driver and officer’s seat.

5.7.7 Cab steps ***shall***$^{(E)}$ be a minimum of eight (8)-inches in depth and 20 inches in width and designed to support a minimum static load of 227 kg (500 lbs). The height from ground level to the first step ***shall*** not exceed 24 inches. The surface of the steps ***shall*** meet the slip resistance of NFPA 1901, Section 15.7.3.

5.7.8 Intermediate steps located in the dorsal area ***shall***$^{(E)}$ be provided for ease of access into the cab area. The surface of the steps ***shall*** meet the slip resistance of NFPA 1901, Section 15.7.3.

5.7.9 Entry assist handles ***shall*** be provided to insure proper hand holds while entering and exiting the cab.

5.8 CREW FLASHLIGHTS

The following ***shall*** be provided/applies:

5.8.1 Four rechargeable Stream Lite Box flashlights provided and mounted in the crew area. Flashlights provided with a charging system and mounting brackets.

5.8.2 The charging system wired into the 110 volt AC power system and provided with a means of automatically switching between shoreline power and inverter power. Switching to the inverter power feed ***shall*** occur automatically when the shoreline auto eject plug is disengaged, and subsequent switching to shoreline power feed ***shall*** occur automatically when the apparatus is hooked into a 110 volt AC power source.

5.9 INTERIOR CAB INVERTER POWER SUPPLY

The interior cab ***shall***$^{(E)}$ be provided with a 1000-watt sine wave inverter. The following applies:

5.9.1 Three (3) inverter 110-volt AC type duplex plugs. One plug provided within easy access to the Officers seat position. Two plugs provided within easy access to the rear cab area seat positions.

5.9.2 DC voltage for the inverter provided through hard wiring to the alternating system and provided with fusible protection commensurate with the voltage/wattage of the receptacle.

5.9.3 Receptacles provided with a plastic identification plate indicating the power feed to the receptacle.

5.10 REAR VIEW CAMERA SYSTEM

The apparatus ***shall***$^{(E)}$ be provided with a Federal Signal rear view camera system, Model CAMSET70-NTSC4B, capable of generating three distinct rear view orientations of the vehicle. The following applies:

5.10.1 The system ***shall***$^{(E)}$ incorporate three colour cameras. The cameras ***shall*** be located as follows:

5.10.1.1 One camera on the left side of the apparatus in a location that provides a full left side view from the driver's mirror to as a minimum the rear outside left bumper area.

5.10.1.2 One camera on the right side of the apparatus in a location that provides a full right side view from the Officer's mirror to as a minimum the rear outside right bumper area.

5.10.1.3 One camera located central to the rear area of the apparatus in a location that provides an unobstructed field of view. The rear facing camera ***shall*** be capable of providing audio signals to the system monitor.

5.10.1.4 All cameras ***shall*** be located and provided with protection from damage occurring during routine operation of the apparatus.

5.10.2 The monitor ***shall*** be mounted in the cab in an area that provides a clear view to the drivers seated position.

5.10.3 Power switches for the rear view camera system ***shall*** be backlit rocker type switches, with the mounting position at the custom cab console.

5.11 MOBILE DATA TERMINAL (MDT)

A Data terminal ***shall*** be provided at the Officer's seated position mounted into the dash area, the following applies:

5.11.1 The MDT ***shall***$^{(E)}$constructed from aluminum.

5.11.2 The MDT ***shall*** be recessed below the dash surface to ensure that the driver's view in not obstructed. A metal slide tray with locking mechanism ***shall*** be provided to allow the tray to be moved toward the Officer's seated position. The slide tray ***shall***$^{(E)}$ provide a lap top mounting surface measuring 15 inches wide x 12 inches deep. The slide mechanism ***shall***$^{(E)}$be provide for approximately 10 inches of travel.

5.11.3 A GFI 110 volt duplex ***shall*** be provided at the MDT area. The receptacle ***shall*** be provided with a 15-amp circuit breaker and wired into both the hydraulic generating system and inverter power supply. Normal power

feed ***shall*** be through the inverter system with automatic switching to the generator power supply when generator operation commences.

5.12 CAB DOORS

The following ***shall*** be provided:

5.12.1 Doors ***shall*****(E)** be constructed of at least 1/8-inch aluminum outer sheet material with an aluminum extruded inner framework. The doors ***shall*** be a flush fit design, bolted to the doorframe with a stainless steel hinges. An extruded rubber gasket ***shall*** be provided on the perimeter of all doors.

5.12.2 The front cab door openings ***shall*****(E)** be approximately 36-inches wide x 68-inches high.

5.12.3 The rear cab door openings ***shall*****(E)** be approximately 33-inches wide x 85-inches high.

5.12.4 The front inner door panels provided with an interior map pocket. The door panels ***shall*** be easily removable for door repairs.

5.12.5 The interior door handles ***shall*** be a flush mount paddle type design.

5.12.6 The exterior door handles ***shall*** be a chrome plated pull type design with a scuff plate measuring approximately 10 inches wide x six inches high. The exterior door handle ***shall*** be of an appropriate size to allow operation/access with a gloved hand.

5.12.7 A stainless steel trim band, 12" high (equal in height to the front bumper), ***shall*** be provided on the lower exterior sides of the cab and doors. No visible exterior fasteners ***shall*** be used to install the trim band.

5.12.8 An aluminum bright finish scuff panel ***shall*** be provided at the base of each entry door extending from the bottom of the door to approximately 4-inches above the floor line at the front doors and approximately 8.5-inches above the floor line at the rear doors.

5.12.9 Each front door window ***shall(e)*** provide a minimum viewing area of 530-square inches and each rear door window ***shall*****(E)** provide a minimum viewing area of 500-square inches. The windows ***shall*****(E)** have 75% light transmittance automotive safety tint and be full roll down.

5.12.10 Power operated windows provided for the front doors and manually operated windows for the rear doors.

5.12.11 Door hinges ***shall*** be adequately reinforced to support the weight of the

door and ensure a solid mounting surface for the hinges.

5.13 CAB MOUNTS AND TILT SYSTEM

The following ***shall*** be provided/applies:

5.13.1 Be independently mounted from the body and chassis on two forward pivoting points, one on each side.

5.13.2 Provided with two springs loaded hydraulic hold down hooks outboard of the frame to hold the cab securely to the frame.

5.13.3 A frame mounted electric over hydraulic, cab lift system with two large diameter, telescoping, hydraulic lift cylinders, one on each side of the cab. The hydraulic pump ***shall*** be equipped with a manual override in the event of an electrical failure.

5.13.4 Safety flow (velocity) fuses ***shall*** $^{(E)}$ be provided in the hydraulic lift cylinders to prevent the cab from suddenly dropping as a result of a burst hose or hydraulic failure during the raising and lowering of the cab assembly.

5.13.5 The lift controls located in a compartment (R 1) on the right side of the cab and be equipped with a Parking brake interlock the will prevent tilting of the cab unless the parking break is set.

5.13.6 The entire cab ***shall*** $^{(E)}$ be capable of being tilted through a 40º (degree) arc to allow for easy access to the engine, transmission and sub-assemblies. A positive release safety latch ***shall*** be provided to lock the cab in full tilt-up position.

5.13.7 A cab ajar indicator warning light ***shall*** be provided on the instrument panel to warn the driver that the cab is not in the locked down position.

5.14 SEATING GENERAL

All seat cushions in the cab ***shall*** $^{(E)}$ be upholstered with FMVSS/302 flame-retardant, water repellent and wear resistant material. Retractable lap belt assemblies ***shall*** $^{(E)}$ be provided for all seating positions. Seat colour ***shall*** be gray or a matching colour to the interior cab trim.

5.15 DRIVER SEAT

The seat ***shall*** $^{(E)}$ be a Seats Inc. 911 high back, ABTS six-way adjustable seat.

5.16 OFFICER SEAT

The following ***shall*** be provided:

5.16.1 The seat ***shall***$^{(E)}$ be a Seats Inc. 911 ABTS with tracks. The seat ***shall***$^{(E)}$ be provided with easy exit, flip-up and split headrest for improved exit with SCBA.

5.16.2 The seat back ***shall***$^{(E)}$ be provided with a ZICO "ULL" bracket with LLS strap.

5.16.3 A removable padded vinyl cover ***shall*** be supplied over the SCBA cavity.

5.17 REAR FACING OUTBOARD SEATS

The following ***shall*** be provided:

5.17.1 Quantity two (2) Seats, Inc. 911 ABTS SCBA seats ***shall***$^{(E)}$ be provided. Seats ***shall*** be located in the wheel well area, facing the rear of the cab.

5.17.2 Each seat back ***shall***$^{(E)}$ be provided with a ZICO "ULL" bracket with LLS strap.

5.17.3 A removable padded vinyl cover ***shall*** be supplied over the SCBA cavity.

5.17.4 The seat ***shall***$^{(E)}$ be provided with easy exit, flip-up and split headrest for improved exit with SCBA.

5.18 REAR FACING CENTRE SEATS

The following ***shall*** be provided:

5.18.1 Quantity two (2) Seats, Inc. 911 ABTS SCBA seats ***shall***$^{(E)}$ be provided.

5.18.2 Each seat back ***shall***$^{(E)}$ be provided with a ZICO "ULL" bracket with LLS strap.

5.18.3 A removable padded vinyl cover ***shall*** be supplied over the SCBA cavity.

5.18.4 The seat ***shall***$^{(E)}$ be provided with easy exit, flip-up and split headrest for improved exit with SCBA.

5.19 MIRRORS

The following ***shall*** be provided/applies:

5.19.1 Two, heavy-duty, heated, motorized, stainless steel, forward mount style mirrors including convex mirrors ***shall***$^{(E)}$shall be provided.

5.19.2 The mirrors equipped with replaceable heads or glass and provided with amber clearance lights.

5.20 INSTRUMENTS AND WARNING DEVICES

The following but not limited to ***shall***$^{(E)}$ be provided/applies:

5.20.1 All gauges and indicators backlit and their function clearly indicated with international symbols and/or bilingual markings. Dashboard gauges ***shall*** be calibrated in Metric Units.

5.20.2 A tachometer with integral hour meter.

5.20.3 Mechanical Speed Counter - The test connection ***shall*** be installed on the pump operator's panel to manually verify the vehicle engine speed displayed on the electronic tachometer.

5.20.4 An odometer.

5.20.5 A coolant temperature gauge, warning light and buzzer for high coolant temperature.

5.20.6 An oil pressure gauge, warning light and buzzer for low oil pressure.

5.20.7 A transmission temperature gauge, warning light and buzzer for high transmission temperature.

5.20.8 Air filter restriction indicator.

5.20.9 A voltmeter or ammeter.

5.20.10 A warning light for traction control/differential lockup actuation.

5.20.11 a parking brake indicator light.

5.20.12 a fuel and air tanks gauges

5.21 POWER TRAIN WARNING LIGHT PACKAGE

The following but not limited to ***shall***$^{(E)}$ be provided:

5.21.1 Red warning lights ***shall*** be provided to immediately alert the driver of the following critical information:

5.21.1.1 Stop Engine - indicates critical engine fault with an audible alarm.

5.21.1.2 Park Brake - indicates park brake is set.

5.21.1.3 Low Fuel - indicates low fuel with an audible alarm function.

5.21.1.4 Low Coolant Level - indicates low engine coolant level with an audible alarm function.

5.21.1.5 Cab Ajar - indicates tilt cab is not locked down.

5.21.1.6 Volts - indicates high or low system voltage.

5.21.1.7 Low Air - indicates low air pressure with an audible alarm function.

5.21.1.8 Foundation Brakes – indicates foundation brake major system fault.

5.21.2 Amber warning lights ***shall*** be provided to immediately alert the driver of the following non-critical information:

5.21.2.1 Check Engine - indicates non-critical engine fault.

5.21.2.2 Check Transmission - indicates transmission fault.

5.21.2.3 Wait to Start - indicates active engine air preheat cycle.

5.21.2.4 ABS - indicates anti-lock brake system fault.

5.21.2.5 Water in Fuel - indicates presence of water in fuel filter with an audible alarm function.

5.21.2.6 Engine Maintenance - indicates engine maintenance is required.

5.22 CONTROLS

The following ***shall*** be provided/applies:

5.22.1 All controls and switches ***shall*** be backlit and their function clearly indicated with international symbols and/or bilingual markings.

5.22.2 An electronic 97 dBA back-up alarm.

5.22.3 Electrically operated instant release fast idle control ***shall***$^{(E)}$ be provided. The fast idle ***shall*** be configured to ensure that it cannot be engaged when the transmission is in gear and the parking brakes applied.

5.22.4 A weather band AM/FM radio w/CD player provided above the driver's seated position. The system ***shall***$^{(E)}$ be provided with four (4) cab-mounted speakers with two speakers installed in the front area of the cab and two speakers installed in the rear area of the cab. Speaker position will be dependant on cab design.

5.22.5 Wiper motors with intermittent pantograph windshield wipers with a 70-degree sweep. Each arm ***shall*** be activated by a separate electric motor.

5.22.6 Wet arm electric windshield washers with a 1-gallon reservoir.

5.22.7 Master battery disconnect/ignition switch w/indicator light.

5.22.8 Keyless starter/stop switch.

5.22.9 Dual air horns provided as follows;

5.22.9.1 The horns ***shall***$^{(E)}$ protrude through the bumper, be mounted on each side of the frame rails and equipped with snow shields.

5.22.9.2 The horns ***shall***$^{(E)}$ be provided with a foot activation control for both the driver and officer.

5.22.9.3 The air horn system ***shall*** include a pressure protection valve that will prevent the air brake system from being depleted.

5.22.10 Electric horn(s) with steering wheel activation button.

5.22.11 A pump shift control equipped with green "Pump in Gear" and "O.K. to Pump" indicator lights.

5.23 AIR CONDITIONING AND HEATING SYSTEM(S)

The following ***shall***$^{(E)}$ be provided/applies:

5.23.1 A minimum 40,000-Btu air conditioning system with a condenser. The refrigerant provided ***shall***$^{(E)}$ be R134A or equivalent environmentally friendly refrigerant.

5.23.2 The unit mounted in the mid-cab position and clear of all seating positions. The airflow ***shall***$^{(E)}$ be approximately 500-cfm.

5.23.3 The unit provided with a minimum of six louvered discharge ports that are directed to the front and rear of the interior cab. A three-speed blower switch ***shall*** be provided with easy access from the driver's position.

5.23.4 An in cab heater and defroster system ***shall***$^{(E)}$ be provided with a minimum capacity of 48,000 BTU/hr. All necessary controls ***shall*** be positioned for easy access by the operator. The system ***shall*** have the ability to provide heated air delivery directly to the windshield area for defrosting/defogging operation.

6 12 VOLT DC ELECTRICAL SYSTEM

6.1 ELECTRICAL SYSTEM FEATURES

The following ***shall*** be provided:

6.1.1 A 270-amp SAE (J56) rated, 240-amp NFPA 1901 rated, alternator with internal rectifier and regulator.

6.1.2 Where a through-frame bulkhead connector is necessary, the connection ***shall*** be provided with protective looms, grommets or other appropriate wrapping at each point that a connection passes through a panel or structural members.

6.1.3 All electrical circuits ***shall*** be provided with circuit protection utilizing either fuses, relays or circuit breakers.

6.2 CHASSIS ELECTRICAL SYSTEM

The following ***shall*** be provided:

6.2.1 A Vehicle Data Computer (VDC) ***shall***$^{(E)}$ be provided within the electrical system to process and distribute engine and transmission Electronic Control Module (ECM) information to chassis system gauges, message center, and related pump panel gauges. Communication between the VDC and chassis system gauges ***shall***$^{(E)}$ be through a 4-wire multiplexed communication system to ensure accurate engine and transmission data is provided at the cab dash and pump. The VDC ***shall*** be protected against corrosion, excessive heat, vibration, and physical damage.

6.2.2 The chassis system ***shall*** have a centrally located electrical distribution area and have all electrical components located in a manner that does not interfere with or disrupt vehicle operation(s). An access cover ***shall*** be provided for access to the electrical distribution area.

6.2.3 An automatic thermal reset master circuit breaker compatible with the alternator size. Automatic reset circuit breakers ***shall*** be provided for the directional lights, driving lights and the emergency lighting systems.

6.2.4 Fused power connections ***shall***$^{(E)}$ be provided for radio(s), chargers and siren installations at the electrical distribution area. Radio suppression ***shall*** be installed to allow radio equipment operation without interference.

6.2.5 All wiring ***shall***$^{(E)}$ be mounted in the chassis frame and protected from water and heat, be colour coded and functionally labelled every six (6)-inches. Wiring harness ***shall*** conform to SAE J1127 or SAE J1 128 with GXL temperature properties. Any wiring connections or harness exposed to the outside environment ***shall*** be weather resistant and covered in a 280-degree rated loom to protect against damage.

6.3 VEHICLE DATA RECORDER

The apparatus ***shall*** be provided with a vehicle data recorder meeting the requirements outlined at NFPA 1901, chapter 4.11.

6.4 ROLL STABILITY

The apparatus ***shall*** meet one of the following criteria or be provided with a Stability Control System:

6.4.1 The apparatus ***shall*** remain stable to a 26½ degree angle in both directions when tested on a tilt table IAW SAE J2180.

6.4.2 The calculated centre of gravity ***shall*** be no higher than 80 percent of the rear axle track width. The centre of gravity calculation ***shall*** be certified by a Professional Engineer. The centre of gravity calculation ***shall*** be based on a computer generated model utilizing Industry accepted software.

6.4.3 A copy of the apparatus stability certification ***shall*** be provided to the Technical Authority at the pre-delivery inspection.

6.4.4 *Should* the apparatus not meet one of the standards defined at Specification Item 6.4.1 or 6.4.2, the manufacturer ***shall*** provide the apparatus with a stability control system. The stability control system ***shall*** have, at a minimum, a steering wheel position sensor, a vehicle yaw sensor, a lateral accelerometer, and individual wheel brake controls.

6.5 MAIN CONTROL SYSTEM

The following applies:

6.5.1 The apparatus ***shall*** be provided with an in-vehicle networking system, also known as multiplexing, to provide real time or current state diagnostic capability and reduce troubleshooting or down time when compared to a standard point to point wiring scheme.

6.5.2 The system ***shall***$^{(E)}$ have the capability of delivering multiple signals via a CAN bus, utilizing specifications set forth by SAE J1939.

6.5.3 For superior systems integrity, the networked system ***shall***$^{(E)}$ meet the following minimum requirements;

6.5.3.1 Universal System Manager (USM) containing the main processor and load manager.

6.5.3.2 Integrated load management functions such as load shedding.

6.5.3.3 Self contained LED diagnostic indicators; PWR for input power status (red); BUS for output power status (yellow) and; COM for communication status (green).

6.5.3.4 Power Distribution Module - input/output modules.

6.5.3.5 Switch input capability.

6.5.3.6 Solid state circuitry.

6.5.3.7 Responsible for lighting device activation.

6.5.3.8 Diagnostic display for warning message indication.

6.5.3.9 Vocation Module to allow for failsafe pumping operations in the event of a fault occurrence within the multiplex system.

6.5.4 The electrical system ***shall*** be pre-wired for modem accessibility to allow service personnel to easily plug in a modem and phone line. The modem accessibility ***shall*** be designed to allow remote diagnostics, troubleshooting, or program additions and include the ability to interface diagnostic equipment (laptop computer).

6.5.5 Dual diagnostic display screen ***shall***$^{(E)}$ be provided in the cab for easy identification of fault and condition messages. One display within easy viewing range of the drivers seated position and the second screen provided for easy viewing from the Officers seated position.

6.5.6 The display screens ***shall***$^{(E)}$ provide the operator and Officer with detailed messages such as which compartment door is ajar. The display ***shall***$^{(E)}$ also allow for complete diagnostic capability without the use of additional hardware or software.

6.5.7 The Multiplex system ***shall***$^{(E)}$ be provided with an integral Global Positioning System, with map programming specific to Canada. Map display information ***shall*** be provided at the Officer's screen only.

6.6 BODY WIRING

The following applies:

6.6.1 All electrical equipment installed by the apparatus manufacturer ***shall*** conform to current automotive electrical system standard and the requirements of the applicable NFPA Apparatus Standard.

6.6.2 The main low voltage chassis to body interface point and distribution panel ***shall*** be provided at the front of the body in a location providing easy service access. The distribution panel ***shall*** be labelled and contain body electrical relays and wire connection bar. The distribution panel ***shall*** be located so as not to reduce useable compartment space.

6.6.3 Electrical connections in exposed areas ***shall*** be made using heat shrink or weather proof connections and be protected with automatic reset circuit breakers.

6.6.4 All electrical equipment switches ***shall***$^{(E)}$ be mounted on a switch panel mounted in the cab convenient to the operator. Light switches ***shall***$^{(E)}$ be rocker type with integral indicator light to indicate when the circuit is energized and appropriately identified as to function.

6.7 ELECTRICAL SYSTEM LOAD MANAGER

The following applies:

6.7.1 The vehicle's electrical system ***shall***$^{(E)}$ be equipped with an integrated load management device such as the Universal System Manager (USM). The USM ***shall***$^{(E)}$ be a one-touch device designed to provide protection against reverse voltage and electrostatic damage.

6.7.2 The integrated load management functions ***shall***$^{(E)}$ be as follows;

6.7.2.1 Eight electrical load priorities, #0-through 7.

6.7.2.2 The sequence of load shedding ***shall***$^{(E)}$ start with #7 and proceed in order to #1 with #0 never shedding.

6.7.3 Electrical load shedding ***shall*** be tied through the parking brake and only shed during stationary operations. Only devices not required for stationary operation, in accordance with current NFPA requirements, will be

available for load shedding. Electrical loads shed during stationary operations will be reactivated when the Park brake is released.

6.7.4 Automatic fast idle activation ***shall*** occur before load shedding. The fast idle ***shall*** automatically activate whenever the parking brake is set and the system voltage drops below 12.8-volts for one minute. The fast idle ***shall*** remain on for a minimum of 10-minutes and until a minimum of 13.0-volts are achieved. The fast idle function ***shall*** be automatically cancelled if the Park brake is released or the pump is shifted into gear or the Service brake is depressed.

6.7.5 The load manager ***shall***$^{(E)}$ include the following features;

6.7.5.1 Digital display for diagnostics and status information.

6.7.5.2 Test button to cycle all loads and the ability to verify load shedding sequences without draining the battery.

6.7.5.3 Override switch ***shall*** be provided, with label, to override operation of the management system, IAW NFPA requirements.

6.7.5.4 Visual and audible low voltage alarm control.

6.7.6 The apparatus low voltage electrical system ***shall*** be tested for compliance with NFPA 1901, Section 13.14. The manufacturer ***shall*** provide the electrical system test documentation outlined in NFPA 1901, chapter 13.15 to the Technical Authority during the pre-delivery inspection. DND reserves the right to be present and witness testing and certification.

6.8 MULTIPLEX MODEM KIT AND DATA LOGGER

The following ***shall***$^{(E)}$ be provided:

6.8.1 Multiplex Modem Kit - The kit ***shall***$^{(E)}$ include modem, adapter for PDA device/laptop computer interface and adapter harness. The diagnostic hook up ***shall*** be located in an easily accessible location.

6.8.2 Multiplex Data Logger - The data logger ***shall*** record historical faults within the multiplex system and be accessible through the diagnostic software as well as the information center.

6.9 BATTERIES AND CHARGER

The following applies:

6.9.1 Four heavy-duty maintenance free batteries ***shall*** be provided. The batteries ***shall*****(E)** have a total capacity of approximately 3,800-CCA.

6.9.2 Battery jumper studs ***shall*** be provided to allow jump-starting of the engine without having to tilt the cab. The studs ***shall*** be equipped with colour coded vinyl protective caps that are fastened to the vehicle.

6.9.3 A master disconnect switch ***shall*** be provided between the positive side of the batteries and the positive slave receptacle stud. The positive battery lead ***shall*** be attached to one side of the switch and the positive jumper stud attached to the other side of the switch. The switch ***shall*** be located in the vicinity of the jumper studs.

6.9.4 Access to the jumper studs and master disconnect switch ***shall*** not require raising the cab assembly.

6.9.5 The batteries ***shall*****(E)** be housed and secured in a corrosion resistant, ventilated battery box. The box ***shall*** be conveniently located and easily accessible for the operator to perform daily routine inspection(s).

6.10 BATTERY CHARGER/ANCILLARY COMPRESSOR

A Kussmaul Auto Charge D Pump Plus, model #091-9-DDP, combination battery charger, air compressor and remote bar graph indicator ***shall*****(E)** be provided. The following applies:

6.10.1 A 1 10V Kussmaul Super Auto-Eject 30 amp receptacle with a hinged weatherproof cover.

6.10.2 The auto-eject receptacle provided at the lower curb side rear area of the apparatus and provide power to the Pump Plus compressor/battery charger assembly.

6.10.3 The bar graph indicator ***shall*****(E)** be provided at the front upper road side fender area.

6.11 CAB HEADLIGHTS / FRONT TURN SIGNAL ASSEMBLIES

The following applies:

6.11.1 Dual rectangular 6x4 inch sealed beam halogen headlights ***shall*** be provided. The low beam headlights ***shall*** activate with the release of the parking brake and function as daytime running lights.

6.11.2 Activation of the headlight switch ***shall*** automatically override the daytime running light function.

6.11.3 The headlights ***shall*** be housed in chrome-plated bezels.

6.11.4 A combination turn signal and front warning light ***shall*** be provided. The light ***shall*** be a 6 x 4-inche sealed beam halogen light. The warning light will function as part of the NFPA lower level warning package. The lights ***shall*** (e) be housed in chrome-plated bezels, one light assembly located above the left and right headlight assemblies.

6.11.5 The turn signal ***shall***$^{(E)}$ be provided with an amber lens and the warning light provided with a red lens.

6.12 REAR BRAKE / TURN / SIGNAL / BACKUP LIGHT ASSEMBLIES

The following LED/incandescent Weldon 4694 Series light assemblies ***shall***$^{(E)}$ be provided as follows applies:

6.12.1 A four lamp combination stop/tail, signal, backup and warning light assembly provided at the rear of the apparatus, one assembly located on each rear side of the vehicle.

6.12.2 Lamps ***shall***$^{(E)}$ be arranged in the following order beginning at the top of the assembly:

6.12.2.1 An LED Stop/tail signal lamp with a red lens.

6.12.2.2 An LED Signal lamp with an amber lens and sequential operation.

6.12.2.3 An incandescent backup lamp with clear lens.

6.12.2.4 An LED warning light with red lens, this light ***shall*** form part of the NFPA lower level emergency lighting requirements.

6.12.3 Individual lamps ***shall*** measure 4x6 inches and be housed in a single chrome plated bezel.

6.13 BODY CLEARANCE LIGHTS – NON EMERGENCY

All clearance lights ***shall*** be LED. The following body marker lights ***shall*** be provided:

6.13.1 Upper Body Rear

6.13.1.1 Two red clearance lights, one light located at the left and right edge of the body. Lights ***shall*** be located as high as practical on the rear body at the outer body edges.

6.13.2 Upper Body Side

6.13.2.1 Two red clearance lights, one light located on the left and right side of the body. Lights ***shall*** be located as far as practical to the rear side/top of the body

6.13.3 Lower Body Rear

6.13.3.1 Three red clearance lights centered at rear, recessed in the rub rail.

6.13.3.2 Two red clearance lights located as far as practical to the outer left and right edge of the body, recessed into the rub rail.

6.13.3.5 One red clearance light located on each side of the body as far rearward as practical, recessed in the rub rail.

6.13.4 Lower side

6.13.4.1 One amber clearance light located on each side of the body as far forward as practical, recessed in the rub rail.

6.13.4.2 One amber clearance/auxiliary turn light centered on each side of the body, and recessed in the rub rail.

6.14 INTERIOR CAB LIGHTING

The following ***shall*** be provided:

6.14.1 Four individually switched Weldon 8081 Series ceiling lights ***shall***$^{(E)}$ be provided. Each light ***shall*** be equipped with a white and a red lens and be provided with an integral switch that allows the light to be changed between red and white illumination.

6.14.2 Mounting location of the lights will be determined by cab design. Two lights ***shall*** be provided at the front of the cab and two lights provided at the rear area of the cab mounted as far as practical at the left and right sides.

6.14.3 All cab ceiling lights ***shall*** be wired to automatically illuminate when a cab door is opened. Ceiling lights ***shall***$^{(E)}$ be provided with individual switches for singular operation when the cab doors are closed.

6.14.4 A master ceiling light switch within easy reach of the driver and Officers seated position ***shall*** be provided to simultaneously illuminate all ceiling lights.

6.15 CAB STEP LIGHTS

The following ***shall*** be provided:

6.15.1 LED strip lighting provided at the upper horizontal surface of the intermediate step well for each door. Individual door step lights ***shall*** automatically illuminate when the respective door is opened.

6.15.2 The upper entry step provided with a lip or means of protecting the LED strip lighting from damage.

6.16 GROUND LIGHTS

The following ***shall*** be provided:

6.16.1 The apparatus ***shall***$^{(E)}$ be equipped with ground lighting that is capable of providing illumination at a minimum level of 1 fc (10 lx) on ground areas within 30 in. (800 mm) of the edge of the apparatus in areas designed for personnel to climb onto the apparatus or descend from the apparatus to the ground level.

6.16.2 The apparatus ***shall*** be provided with sufficient ground lighting, and IAWNFPA 1901 requirements, the following applies:

6.16.2.1Ground lights at each door entry point. The lighting applicable to each entry door ***shall*** automatically illuminate when the entry door(s) open.

6.16.2.2 Ground lights at the left and right outside corners of the front and rear bumper areas.

6.16.2.3 Ground lighting provided with a rocker style backlit master switch to illuminate all ground lighting simultaneously. The switch ***shall*** be provided within easy reach of the drivers seated position and provided with a nameplate to indicate function.

6.16.3 A master ground light switch within easy reach of the driver and Officers seated position to illuminate all ground lighting when the doors are closed.

6.16.4 The ground light switch ***shall*** be interfaced to the parking brake and activate only once the parking brake has been set.

6.17 ENGINE COMPARTMENT

The engine compartment ***shall*** be provided with a light that automatically illuminates when the cab is tilted forward and automatically shuts off when the cab is lowered.

6.18 FOG LIGHTS

The following ***shall*** be provided:

6.18.1 Two Hella Model 550 fog lights ***shall***$^{(E)}$ be mounted at the front bumper.

6.18.2 Fog lights ***shall*** be interfaced with the high/low beam selector switch and only operate in conjunction with the low beam headlights. Fog lights ***shall*** automatically shut off when the high beam headlights are activated.

6.18.3 A toggled backlit fog light switch within easy reach of the drivers seated position.

6.19 COMPARTMENT LIGHTING

The following ***shall*** be provided:

6.19.1 Each compartment provided with LED strip lighting and located in such a position to prevent damage during the loading and unloading of the compartment.

6.19.2 Compartment doors switches to automatically activate the lighting when the door is opened and turn off the lighting when the door is closed.

6.19.3 Compartment door switches ***shall*** be wired through a red flashing door ajar light located in the cab to alert the driver that a body compartment door is open. The door ajar warning light ***shall*** be interlocked through the parking brake and activate the light when the park brake is released.

6.19.4 Main feed power for the compartment light circuit ***shall*** be provided through the Master Switch. Turning the master switch off ***shall*** cease all electrical power feed to the compartment lights.

6.20 PUMP COMPARTMENT LIGHT

The following ***shall*** be provided:

6.20.1 The pump compartment with a light or two to illuminate the pump area during servicing.

6.20.2 The pump compartment light switch ***shall*** be at the enclosed pump panel and labelled to indicate function.

6.20.3 The light ***shall*** be interlocked with the park brake and automatically turn off when the park brake is released.

6.21 PUMP PANEL LIGHTING

The following ***shall*** be provided:

6.21.1 Three Weldon #2030 lights ***shall***$^{(E)}$ be mounted under a light shield directly above each pump panel.

6.21.2 A backlit rocker switch labelled as "Work Lighting" ***shall*** be provided at the dash area to activate the exterior pump panel lighting.

6.21.3 The work light switch ***shall*** be interfaced with the parking brake and power to the switch ***shall*** only occur when the parking brake is set.

6.21.4 The lights ***shall*** automatically turn off when the park brake is released.

6.22 HOSE BED LIGHT

The following ***shall*** be provided:

6.22.1 One 6-inch chrome plated 12-volt floodlight installed at the front area of the hose bed IAWNFPA 1901.

6.22.2 A backlit rocker switch at the enclosed pump panel to activate the hose bed light.

6.23 DECK LIGHTS

The following ***shall*** be provided:

6.23.1 Two 6-inch chrome plated 12-volt floodlights installed at the rear of the apparatus and be controlled with the work light switch (item 6.21.2). An additional switch ***shall*** be provided with each light to allow the light to be switched on or off at the light.

6.23.2 The lights ***shall*** be interlocked with the park brake and automatically turn off when the park brake is released.

6.24 SCENE LIGHTS

The following ***shall***$^{(E)}$ be provided:

6.24.1 Six Weldon 3010 series 12-volt scene lights with 26-degree tilt down optics. All electrical connectors enclosed in the housing providing protection against the elements.

6.24.2 Two backlit rocker switches at the dash area within easy reach of the driver's position to activate the scene lighting. One switch ***shall*** be dedicated to left side and one switch dedicated to right side scene lighting.

6.24.3 The lights ***shall*** be interlocked with the park brake and automatically turn off when the park brake is released.

6.24.4 Scene light switches labelled to indicate function.

6.24.5 Scene lights ***shall*** be provided at the following locations;

6.24.5.1 One light on each side of the cab, located as high as practical between the front and rear door area.

6.24.5.2 Two lights located as far as practical to the front of the body. One light located on the left and right side. Lights ***shall*** be positioned as high as practical.

6.24.5.3 Two lights located as far as practical to the rear of the body. One light located on the left and one on the right side. Lights ***shall*** be positioned as high as practical.

6.25 HAND HELD SPOTLIGHT

The following ***shall***$^{(E)}$ be provided:

6.25.1 One 300,000-candle power hand held spotlight, with a momentary type control switch, coiled cord and bracket.

6.25.2 The spot light mounted on the right front seating area (Officers position) of the cab and hard wired into the 12-volt electrical system.

7 EMERGENCY LIGHTING AND SIREN SPEAKER

7.1 GENERAL REQUIREMENT

The following ***shall*** be provided:

7.1.1 The emergency lighting system ***shall*** be provided with a three way multi position master optical warning switch to control all apparatus emergency lighting systems as follows:

7.1.1.1 Switch position one – ***shall*** turn off all emergency lighting systems.

7.1.1.2 Switch position two – ***shall*** turn on all lighting systems.

7.1.1.3 Switch position three – ***shall*** turn off all lighting systems positioned below the roofline.

7.1.2 The three way multi position master optical warning switch ***shall*** be interfaced with the parking brake and the transmission. The following lighting activation ***shall*** occur automatically:

7.1.2.1When the three-way multi position master optical warning switch is in position two and the parking brake is released or the automatic transmission is not in park, the warning devices signaling the call for the right-of-way ***shall*** be energized.

7.1.2.2 When the three-way multi position master optical warning switch is in position two and the automatic transmission is in park or the parking brake is applied, the warning devices signaling the blockage of the right of-way ***shall*** be energized.

7.1.3 All required flashers, wiring, switches, and hardware applicable to the completed installation IAW NFPA 1901 requirements ***shall*** be provided.

7.2 ZONE A UPPER LEVEL EMERGENCY LIGHTING

An NFPA 1901 compliant Cab Roof Light Bar ***shall*** be provided. The following applies:

7.2.1 The light bar provided ***shall***$^{(E)}$ be a Federal Signal 53 inch Vista SL Model 581NFPA53-CL1.

7.2.2 Warning lights ***shall***$^{(E)}$ be provided with flashers producing a minimum of 75 flashes per minute (fpm).

7.3 ZONE B AND D UPPER LEVEL EMERGENCY LIGHTING

Upper level emergency lighting requirements for zones B and D have been met through the application of the upper level lighting at zone A and C. No additional lighting is required to meet NFPA 1901 requirements.

7.4 ZONE C UPPER LEVEL EMERGENCY LIGHTING

The following ***shall*** be provided:

7.4.1 Two Federal Signal JVP100 View Point pod lights with red lens ***shall***$^{(E)}$ be provided and mounted as high as practical. One light ***shall*** be provided at the left and right outer most edges of the apparatus. The lights ***shall***$^{(E)}$ provide 175 fpm.

7.4.2 One Federal Signal Cuda TriOptic LED Signal Master model 328180 amber warning light bar ***shall***$^{(E)}$ be provided. The light bar ***shall*** be provided with a dedicated backlit rocker switch to enable use of the light bar without having all upper level emergency lighting in operation.

7.5 ZONE A LOWER LEVEL EMERGENCY LIGHTING

The following applies:

7.5.1 Lower level emergency lighting requirements ***shall*** be met through the dual turn signal/warning light detailed at Specification Item 6.11.

7.5.2 Zone A lower level warning lights ***shall***$^{(E)}$ provide 175 fpm.

7.6 ZONE B AND D LOWER LEVEL EMERGENCY LIGHTING

The following ***shall*** be provided:

7.6.1 Six (6) Weldon 4600 Series LED warning lights ***shall***$^{(E)}$ be provided.

7.6.2 One (1) light located on each side at the forward most point (as is practical).

7.6.3 One (1) light located on each side at the rearward most point (as is practical).

7.6.4 One (1) light located on each side at the mid-ship point.

7.6.5 The optical center of any lower-level device ***shall***$^{(E)}$ be in between 460 mm and 1600 mm (18 in and 62 in) above level ground.

7.7 ZONE C LOWER LEVEL EMERGENCY LIGHTING

The following ***shall***$^{(E)}$ be provided:

7.7.1 Two (2) Weldon 4600 Series LED warning lights. One (1) light ***shall*** be located on each side of the rear of the apparatus positioned as far to the outer edges as practical. The optical center of any lower-level device detailed at Specification Item 7.6.5.

7.8 SIREN/SPEAKER

The following ***shall***$^{(E)}$ be provided:

7.8.1 One Federal Model EQ2B 200 watt siren.

7.8.2 One Federal Signal model BP200 speaker with classic Q grille flush mounted in the front bumper on the centerline of the apparatus.

7.8.3 A two-position rocker switch ***shall*** be installed in the cab dash and properly labelled to enable operator to activate one of the following from the steering wheel horn button, OEM Traffic horn or Federal Signal EQ2B

7.8.4 The Officers seated position ***shall*** provided with a foot operated switch to activate the siren.

8 110-VOLT PACKAGE

8.1 HYDRAULIC GENERATOR

The following ***shall***$^{(E)}$ be provided:

8.1.1 A Harrison 8000 watt hydraulic generator.

8.1.2 A quad meter consisting of one voltmeter/hour meter, one frequency meter, and two ammeters.

8.1.3 The hydraulic motor, generator, blower, cooler, and necessary hydraulic components ***shall*** be mounted in a rugged steel case. The housing ***shall*** be lined with acoustical material to reduce noise levels.

8.1.4 To optimize cooling efficiency and minimize installation space requirements the generator ***shall***$^{(E)}$ exhaust hot air straight up through the housing.

8.1.5 The hydraulic pump ***shall*** be PTO driven by the chassis transmission. A PTO switch ***shall*** be mounted on the cab instrument panel to engage the PTO and start the generator.

8.1.6 The generator ***shall*** be tested operating at 100-percent of its nameplate voltage for a minimum of 2-hours IAW current NFPA1901 standards.

8.2 BREAKER BOX

The following ***shall*** be provided:

8.2.1 A ten-place breaker box with up to ten appropriately sized ground-faults interrupter circuit breakers and a master breaker sized according to the generator output.

8.2.2 The breaker box ***shall***$^{(E)}$ be mounted in the left front upper compartment ahead of the rear wheels and located on the back wall of the compartment.

8.3 ELECTRIC CORD REELS

The following ***shall*** be provided:

8.3.1 Two (2) Akron Brass Company electric rewind cord reels model ERWC-15-10 with 250 feet of 12/3 600 volt wire ***shall***$^{(E)}$ be provided preferably in compartment R 3.

8.3.2 The cord reels ***shall*** be hard wired into the generating system and provided with a 20-amp circuit breaker. The reels ***shall*** be mounted in an upper compartment, one on the left side and one on the right side of the apparatus.

8.3.3 Cord reels with an adjustable cable stop and outlet junction box consisting of four (4) duplex receptacles conforms to NEMA L5-20R.

8.3.4 A mounting box ***shall*** be provided in the vicinity of the cord reels for storage of the electrical junction boxes.

8.3.5 The cord reels ***shall*** be provided with a 12 VDC electric rewind motor with a manual backup function. The rewind switch ***shall*** be mounted adjacent to the cord reel.

8.3.6 Cord reels provided with top, bottom and side guide rollers to prevent chaffing of the line during deployment and retrieval operations.

8.4 TELESCOPIC QUARTZ LIGHT

The following ***shall*** be provided:

8.4.1 Two (2) 1000-watt FRC Optimum OPA100-M12 quartz light with 240-volt bulb ***shall***$^{(E)}$ be provided at each side of the apparatus, and located at front area of the body/pump module to provide night scene lighting; location to be determined by body design.

8.4.2 The light head ***shall***$^{(E)}$ be mounted on an FRC Model OPA530 Telescopic Pole equipped with a locking knob to hold the pole at the desired height.

8.4.3 The pole ***shall*** include an "up" indicator switch wired to activate a flashing light in the cab when the apparatus park brake is released.

8.4.4 Backlit rocker style switches ***shall*** be provided within easy reach of the driver's position and at the enclosed pump operator's panel. Switches ***shall*** be provided with nameplates to indicated function.

9 APPARATUS BODY CONSTRUCTION DETAIL

9.1 GENERAL DETAIL

9.1.1 The body ***shall*** be fabricated with the highest quality components available and acceptable to the fire service industry. Only new components ***shall*** be used in the manufacturing process.

9.1.2 The body ***shall*** be engineered and designed to provide a low center of gravity.

9.1.3 To ensure strength and integrity of the body, full frame body construction ***shall*** $^{(E)}$ be utilized. The entire body superstructure and sub frame ***shall*** $^{(E)}$ be constructed of heavy-duty tubular aluminum and channels.

9.1.4 To provide maximum corrosion protection all compartments ***shall*** $^{(E)}$ be fabricated with 1/8 inch, salt-water marine grade 5083-H32 1 aluminum panels.

9.1.5 All running boards and rear body surfaces (except back face of beavertails) ***shall*** $^{(E)}$ be constructed from aluminum fire apparatus quality diamond plate.

9.1.6 Beavertails ***shall*** be provided at the rear of the body and ***shall*** be part of the body framework to give added support to the rear tailboard. The beavertails ***shall*** $^{(E)}$ be constructed from heavy duty aluminum extrusions and covered with formed minimum 1/8-inch aluminum panels, painted to match the apparatus colour. The beaver tails ***shall*** be provided with removable panels for access to internal wiring and bolt-on accessories.

9.2 HOSE BED

The following ***shall*** be provided:

9.2.1 The main hose bed ***shall*** be located above the booster tank and provided with a capacity to store a minimum of 600 feet of 4-inch hose, 600 feet of 21/2-inch hose, and 300 feet of 13/4 inch hose. (see Item 10.5.1 for cross lay bed)

9.2.2 The inner sides of the hose bed ***shall***$^{(E)}$ be provided with a natural finish aluminum smooth plate free of protrusions or obstructions.

9.2.3 The hose bed flooring ***shall***$^{(E)}$ be fitted with dry lock panels to allow for air movement under the hose.

9.2.4 Three (3) adjustable tracks with full height hose bed dividers ***shall***$^{(E)}$ be provided. The divider ***shall***$^{(E)}$ be constructed of 1/4-inch smooth aluminum plate with an extruded aluminum base welded to the bottom.

9.2.5 The hose bed ***shall*** be completely removable for easy access to the booster tank.

9.3 HOSE BED ACCESS STEPS

Heavy-duty folding steps that meet NFPA requirements ***shall*** be provided to access the upper body hose bed. The following ***shall*** be provided:

9.3.1 Intermediate pump panel area step ***shall*** be provided at the left and right side of the body to provide access to the cross lay bed and the top of the vehicle.

9.3.2 Step heights ***shall*** be IAW NFPA 1901 requirements. The steps ***shall*** be bolted to the body and provide a maximum stepping height of no more than 18-inches. The top surface of each step ***shall*** be at least 35- square inches and covered with an aggressive slip-resistant surface. Each step ***shall*** be capable of supporting 500-lbs and located to provide an 8-inch clearance between the leading edge of the step and any obstruction.

9.4 HOSE BED COVERS

The following ***shall*** be provided:

9.4.1 A black hypalon cover for the main body hose bed and cross lay hose bed. The cover ***shall***$^{(E)}$ be constructed from heavy duty fire retardant material and provide full hose bed coverage including the hose bed opening. The cover ***shall***$^{(E)}$ be held in place by chrome snaps with one chrome twist lock on each corner of the hose bed.

9.5 BODY RUB RAIL

The following applies:

9.5.1 Both sides of the body and the rear ***shall*** be equipped with a full-length, 3/16- inch thick anodized aluminum 2.75-inches high x 1.25-inches deep

protective rub rail that extends beyond the body width to protect compartment doors and the body side.

9.5.2 The rub rail ***shall*** be a "C" channel designed to allow marker and warning lights to be recessed inside for protection. The top surface of the rub rail ***shall*** be provided with a raised cross hatch type serration design to provide a slip resistant edge for the rear step and running boards.

9.5.3 The rub rail ***shall*** be provided with 1/4 inch nylon spacers between the rail and body. The ends of the rub rail ***shall*** be provided with rounded edges for safety reasons.

9.5.4 The vertical surface inside the "C" channel ***shall*** be inset with a white reflective material.

9.6 HANDRAILS

The following applies:

9.6.1 Access handrails ***shall*** be provided IAW NFPA 1901 requirements at all step and entry positions. Handrails ***shall*** be located/positioned to provide personnel with a three point body contact surface at all locations that require entry or exit from the apparatus cab or body area during fire fighting operations or servicing procedures.

9.6.2 As a minimum hand rails ***shall*** be installed in the following locations, based on apparatus design additional handrails may be required to meet the provisions of Specification Item 9.6.1, details of handrail requirements will be finalized at the pre-production meeting:

9.6.2.1 Two 48-inch handrails, one each side, located on the trailing edge of each beavertail.

9.6.2.2 One 48-inch handrail horizontally below the rear hose bed opening.

9.6.2.3 One 12-inch handrail at the top rear of the body for use with the rear steps.

9.6.2.4 One 12 inch handrail at the top of the body located in a position above the pump panel area.

9.6.3 Handrails ***shall*** be constructed of ribbed, maintenance free, corrosion resistant, extruded aluminum.

9.6.4 Handrails ***shall***$^{(E)}$ be a minimum of 1.25-inch OD and installed between chrome end stanchions with a minimum of 2-inches of space between the

inside surface of the handrail and apparatus body to allow for access with a gloved hand.

9.7 COMPARTMENTS GENERAL DESIGN

The following ***shall*** be provided:

9.7.1 All side and rear compartments ***shall*** be full frame design constructed using heavy duty aluminum extrusions measuring a minimum of 2 inches x 2 inches x 3/16 thickness.

9.7.2 In order to maximize corrosion protection the body compartments ***shall***$^{(E)}$ be fabricated with 1/8" 5083-H321 salt-water marine grade aluminum panels.

9.7.3 All interior compartment seams ***shall*** all be sealed and caulked with a permanent, pliable automotive type sealer.

9.7.4 All compartments provided with a one (1) inch drop on the lower edge of the door opening to accommodate the door seal, and to stop moisture from entering the compartment.

9.7.5 All compartments with sweep out design floors.

9.7.6 All compartments with dry lock mat flooring panels.

9.7.7 All compartments provided with a full-length aluminum drip molding installed over the top of the compartment doors.

9.7.8 All compartments ***shall*** be weatherproof.

9.8 REAR BODY SECTION

The following ***shall*** be provided:

9.8.1 The rear section of the apparatus body (beaver tails) ***shall*** be provided with a painted finish matching the apparatus colour. The interior portion of the rear body section ***shall***$^{(E)}$ be provided with a finished utilizing 1/8" hi-shine 3003-H14 aluminum tread plate panels.

9.8.2 The panels ***shall*** be fastened to the rear body framework with stainless steel fasteners. The stainless steel bolts ***shall*** be drill tapped.

9.8.3 The use of sheet metal screws and or self-tapping screws ***shall*** be considered as non-compliant.

9.9 LEFT SIDE BODY COMPARTMENTS

The following ***shall***$^{(E)}$ be provided/applies to the left side (road side) compartment configuration:

9.9.1 L1 Compartment – located forward of the rear wheels and measuring approximately 48 inches wide x 68 inches high x 27 inches deep in the lower compartment section and 15 inches deep in the upper compartment section. This compartment ***shall*** be provided with a roll up style door.

9.9.2 L2 Compartment - located above the rear wheels and measuring approximately 62 inches wide x 38 inches high x 27 inches deep in the lower compartment section and 15 inches deep in the upper compartment section. This compartment ***shall*** be provided with a roll up style door.

9.9.3 L3 Compartment - located behind the rear wheels and measuring approximately 48 inches wide x 68 inches high x 27 inches deep in the lower compartment section and 15 inches deep in the upper compartment section. This compartment ***shall*** be provided with a roll up style door.

9.10 RIGHT SIDE BODY COMPARTMENTS

The following ***shall***$^{(E)}$ be provided/applies to the right side (curb side) compartment configuration:

9.10.1 R1 Compartment - located forward of the rear wheels and measuring approximately 48 inches wide x 68 inches high x 27 inches deep in the lower compartment section and 15 inches deep in the upper compartment section. This compartment ***shall*** be provided with a roll up style door.

9.10.2 R2 Compartment - located above the rear wheels and measuring approximately 62 inches wide x 38 inches high x 27 inches deep in the lower compartment section and 15 inches deep in the upper compartment section. This compartment ***shall*** be provided with a roll up style door.

9.10.3 R3 Compartment - located behind the rear wheels and measuring approximately 48 inches wide x 68 inches high x 27 inches deep in the lower compartment section and 15 inches deep in the upper compartment section. This compartment ***shall*** be provided with a roll up style door.

9.11 REAR BODY B1 COMPARTMENT

The B1 compartment measuring approximately 42 inches wide x 50 inches high x 30 inches deep. The following applies:

9.11.1 Compartment ***shall*** be provided with a roll up style door.

9.11.2 The B1 compartment ***shall***$^{(E)}$ be provided with a full height compartment on the left side measuring approximately 12 inches wide x 50 inches high x 30 inches deep.

9.11.3 The lower section of the compartment ***shall*** be provided with a full depth adjustable roll out shelf. The upper section of the compartment ***shall*** be provided with an adjustable full depth slide out tilt down tray. Both shelves ***shall*** be provided with three inch rolled edges and cut out slats IAW Specification Item 9.15.2.

9.11.4 The B1 compartment ***shall*** be constructed of aluminum plate and reinforced as required to provide for rigidity and strength of the compartment. Tray slides and mounting hardware provided ***shall*** be capable of supporting a 200 lb load.

9.11.5 The right side of the B1 compartment ***shall***$^{(E)}$ be provided with two (2) PacTrack rollout tool boards. The tool board's size ***shall*** be of the maximum allowable size for the compartment configuration and provided with full rollout ability. The tool boards ***shall*** be designed to allow for adjustment of the tool boards position within the compartment. The tool boards, mounting hardware and slides ***shall*** be capable of supporting a 500 lb load.

9.12 COMPARTMENT VENTS

Each body compartment ***shall***$^{(E)}$ be provided with either a three (3) inch internal vent or with integral body structure venting designed to prevent the entry of water into the compartment interior.

9.13 AMDOR ROLL UP DOORS

The following ***shall*** be provided:

9.13.1 All compartments ***shall***$^{(E)}$ be provided with Amdor Roll-Up type doors consisting of double wall aluminum box section slats with integral hinge joint and recessed slat seal, reusable end shoes, and double wall aluminum reinforced bottom rail with a Stainless Steel Lift Bar door latching system.

9.13.2 Each slat ***shall*** be provided with a recessed slat seal to weatherproof the compartment and reduce rattle between slats.

9.13.3 Door slats ***shall*** be capable of being easily removed and replaced when required.

9.13.4 Each door ***shall*** be equipped with slat seals on the top, bottom and sides to keep moisture and dirt on the outside.

9.14 ADJUSTABLE ROLL OUT SHELVING

The following ***shall*** be provided:

9.14.1 One aluminum adjustable shelf with mounting brackets ***shall***$^{(E)}$ be provided for compartments L1, L3, R1, R3 and B 1. The shelves ***shall***$^{(E)}$ be constructed of 3/16-inch smooth aluminum plate and sized to maximize storage space in accordance with the compartment dimensions. All trays ***shall*** be provided with dry lock panels.

9.14.2 The side edges of the shelves ***shall***$^{(E)}$ be approximately three (3) inches high and provided with cut out slats three inches long by a 1/4 inch high to allow cargo retaining straps to be attached. The cut outs ***shall***$^{(E)}$ be equally spaced at 12-inch centers.

9.15 ROLL-OUT TRAYS

The following applies:

9.15.1 The perimeter edges of all roll out trays ***shall*** be provided with a two (2) inch strip of red and white reflective tape.

9.15.2 One rollout tray ***shall*** be provided in compartments L1, L3, and R1, R3 and B1. The trays ***shall***$^{(E)}$ be constructed of 3/16-inch smooth aluminum and sized to maximize storage space in accordance with the compartment dimensions. All trays ***shall*** be provided with dry lock panels.

9.15.3 The side edges of the shelves ***shall*** be approximately three (3) inches high and provided with cut out slats three inches long by a 1/4 inch high to allow cargo retaining straps to be attached. The cut-outs ***shall***$^{(E)}$ be equally spaced at 12-inch centers.

9.15.4 Roll out trays ***shall*** be floor mounted in the compartment on drawer slides that will permit the tray to roll out of the compartment approximately 22-inches.

9.15.5 The trays ***shall*** be provided with positive style locking latches mounted to the underside of the trays to hold the tray in the closed and open positions.

9.15.6 Roll out tray and slide assemblies ***shall*** be rated for a 250 lb load.

9.16 ROLL-OUT/TILT-DOWN TRAY

The following ***shall*** be provided:

9.16.1 The perimeter edges of all roll out tilt down trays ***shall*** be provided with a two (2) inch strip of red and white reflective tape.

9.16.2 A roll-out/tilt-down tray ***shall*** be provided at the top section of compartments L1, L3, R1, R3 and B 1. All trays ***shall*** be provided with dry lock panels.

9.16.3 The capacity rating of the tray and slide assembly in the extended position ***shall*** be 250 pounds.

9.16.4 Approximately 90% of the tray length ***shall*** rollout from its stored position and ***shall*** tip 30 degrees from horizontal.

9.16.5 The side edges of the trays ***shall*** be approximately three (3) inches high and provided with cut out slats three inches long by a 1/4 inch high to allow cargo retaining straps to be attached. The cut-outs ***shall***$^{(E)}$ be equally spaced at 12- inch centers.

9.16.6 An Innovative Industries Slide Master Tip Down frame and channel assembly ***shall***$^{(E)}$ be provided. The tray(s) ***shall*** be equipped with a positive twist lock to secure it in the stored position.

9.17 SCBA BOTTLE STORAGE COMPARTMENT

The following ***shall*** be provided:

9.17.1 SCBA storage for four 60-minute MSA air bottles ***shall*** be provided. Storage for two air bottles ***shall*** be provided on each side of the apparatus, one bottle stored to the front of the rear axle and one bottle to the rear of the axle.

9.17.2 The storage tubes ***shall***$^{(E)}$ be constructed of high strength" ABS" to provide protection for the bottles, and the bottles held in place by an aluminum-hinged door casting with a positive catch latch.

9.17.3 Each bottle holder door ***shall*** include an inner door seal for increased protection against the elements.

9.18 LADDER RACK

The following ***shall*** be provided:

9.18.1 To permit overhead storage of the ladders and allow for easy removal at ground level, a quick lift Zico Model 3092 hydraulically operated ladder

rack system ***shall***$^{(E)}$ be provided. The ladder rack ***shall***$^{(E)}$ be mounted on the top right side of the apparatus body.

9.18.2 The ladder rack ***shall*** be hard wired into the hydraulic generating system with ladder rack controls located at the right rear of the apparatus and be provided with danger/operation instructions at the ladder rack switch/control panel.

9.18.3 The ladder rack ***shall*** be provided with an audio alarm signal to indicate the ladder rack is in motion.

9.18.4 The area of the center support for the ladder rack ***shall*** be covered with an aluminum tread plate cover that ***shall*** move with the rack.

9.18.5 The ladder rack ***shall*** be capable of carrying a 2-section ladder and a roof ladder.

9.19 BODY SUB FRAME

The following ***shall*** be provided:

9.19.1 The body framework ***shall***$^{(E)}$ utilize a jig assembly manufacturing process to ensure the completed assembly is square.

9.19.2 The body frame rails ***shall***$^{(E)}$ be constructed with 3" x 3" aluminum extrusions, with a wall thickness of 1/4".

9.19.3 The front cross member ***shall***$^{(E)}$ be a heavy duty 3" x 3" x 1/4" aluminum extrusion providing maximum strength and durability.

9.19.4 The rear cross members ***shall***$^{(E)}$ be heavy duty 3" x 3" x 1/4" aluminum extrusions providing maximum strength and durability at the rear section of the body.

9.19.5 Body cross members ***shall*** extend the full width of the body. The cross members ***shall*** provide support for the body side compartments and rear tailboard section.

9.19.6 The body sub frame and the chassis frame ***shall*** be insulated and separated by a rubberized belt.

9.19.7 All body (side and rear) compartments ***shall***$^{(E)}$ be full frame constructed from heavy-duty aluminum extrusions measuring 2 " x 2" x 3/16".

9.19.8 To ensure maximum mounting strength and flexibility the body ***shall***$^{(E)}$ be mounted to the chassis frame rails with four spring loaded side mounting plates.

9.20 WHEEL WELL LINERS

The following ***shall*** be provided:

9.20.1 Full width wheel well liners ***shall*** be provided.

9.20.2 Wheel well liners ***shall***$^{(E)}$ be a two-piece construction with an inner liner of vacuum formed ABS composite and an outer fenderette measuring approximately 3.50" wide made of 14 gauge 304 polished stainless steel.

9.21 REAR STEP

The following ***shall*** be provided:

9.21.1 A Tailboard Step ***shall*** be provided at the rear of the body and not exceed 24-inches in height IAW NFPA 1901 requirements.

9.21.2 The step ***shall*** have a gripping surface meeting NFPA requirements.

9.21.3 The step ***shall*** be easily removable and bolted on to the beavertails from the underside to produce a clean surface. A label ***shall*** be provided at the rear to warn personnel that riding on the rear step while the vehicle is in motion is prohibited.

9.21.4 The tailboard step ***shall*** be rated for a load capacity of 500 lbs.

9.22 PUMP HOUSE

The following ***shall*** be provided:

9.22.1 The pump house ***shall***$^{(E)}$ be a full frame module constructed from heavy-duty structural aluminum extrusions.

9.22.2 The pump house ***shall***$^{(E)}$ be mounted to the chassis with side mounting plates and bolted to the chassis frame rails.

9.22.3 The pump house ***shall*** be entirely painted inside and out before it is installed on the chassis and before any components or attachments are installed.

9.22.4 The side pump panels ***shall***$^{(E)}$ be constructed from #4 finish, 14 gauge stainless steel. Both the right side and left side pump panels ***shall*** be bolted

to the pump house for ease of removal. The panels ***shall*** be installed with isolation tape and stainless steel screws.

9.23 PUMP INSPECTION DOOR EXTERIOR

The following ***shall*** be provided:

9.23.1 The left and right exterior pump panels ***shall*** be provided with a maintenance access door at the upper area. The door ***shall*** be manufactured from high shine aluminum plate.

9.23.2 The access door ***shall*** be provided with two (2) stainless steel combination paddle latch/handle assemblies.

9.23.3 The access door ***shall*** be designed to enable full removal of the door assembly in order to provide easy access to the pump for repair and maintenance.

9.23.4 Door size ***shall*** be the maximum allowable IAW with apparatus design.

9.24 PUMP INSPECTION DOOR INTERIOR

The following ***shall*** be provided:

9.24.1 The lower section of the interior pump operator's panel ***shall*** be provided with an inspection door that is fastened by paddle latch handle assemblies.

9.24.2 The access door ***shall(E)*** measure approximately 32 inches high x 60 inches wide and manufactured from 1/8 inch high shine aluminum checker plate.

9.24.3 The access door ***shall*** be provided with an insulation covering on the pump side to provide noise reduction during operations.

9.25 ENCLOSED PUMP CONTROL PANEL - TRANSVERSE

The following ***shall*** be provided:

9.25.1 The pump operator's panel ***shall(E)*** be constructed from #4 finishes, 14 gauge stainless steel.

9.25.2 The top tier (portion) of the panel ***shall*** be provided with a stainless steel piano hinge located at the bottom and two (2) lift and turn twist lock latches located at the top of the panel to permit interior access for pump and gauge servicing. This panel ***shall*** contain all gauges and monitoring instruments required for pump operation. All cut outs in the panel ***shall*** be laser cut to provide a smooth exact fit.

9.25.3 The top of the upright panel ***shall***$^{(E)}$ be provided with LED strip lighting measuring 48 inches in length. An on/off light power switch ***shall*** be provided at the pump panel and labelled to indicate function.

9.25.4 All gauges and controls ***shall*** be symmetrically and logically laid out to easily enable the pump operator to monitor pump operation.

9.25.5 Pump panel layout and design ***shall*** be submitted to the Technical Authority for final review and approval.

9.25.6 The bottom/lower tier (portion) ***shall***$^{(E)}$ be screwed in place to allow for removal and access for servicing purposes.

9.25.7 The lower level ***shall*** be provided with valve controls.

9.25.8 Valve controls provided ***shall*** be a twist lock handle design connected to stainless steel aircraft type cables.

9.25.9 Three (3) Akron 8086 series lights ***shall***$^{(E)}$ be provided at the ceiling above the enclosed pump operator's panel. The lights ***shall*** be equally spaced along the ceiling surface in order to provide maximum lighting to the pump panel. A light activation switch ***shall*** be provided at the pump panel.

9.26 EXTERIOR REAR CAB TRIM

The following ***shall*** be provided:

9.26.1 The exterior back wall of the cab ***shall***$^{(E)}$ be covered with 1/8 inch high shine aluminum checker plate. Isolation tape (UHMW) ***shall***$^{(E)}$ be installed between the checker plate and the chassis cab prior to installation.

9.27 PUMP PANEL WEATHERPROOFING

The following applies:

9.27.1 A heavy-duty rubber barrier ***shall*** be provided under the cross control pump operator's panel to aid in retention of pump compartment heat and to reduce contaminants from entering the pump operator's area.

9.28 PUMP HOUSE HEATERS

The following ***shall*** be provided:

9.28.1 Two (2) 17,500 BTU forced air heaters ***shall***$^{(E)}$ be provided within the pump house area.

9.28.2 One (1) heater ***shall*** be provided at each side directly in front of the drain valves and auxiliary suction valves.

9.28.3 Switches for operation of the heaters ***shall*** be provided at the enclosed operators pump panel and labelled to indicate function.

9.29 HEAT PAN

The following ***shall*** be provided:

9.29.1 The bottom of the pump house ***shall***$^{(E)}$ be provided with a heat pan.

9.29.2 The heat pan ***shall*** totally enclose all sides, front, and bottom of the pump house.

9.29.3 The heat pan provided ***shall*** be constructed from sheet aluminum and installed to the underside of the pump house. The heat pan design ***shall*** provide for a removable bottom section.

9.30 PUMP PANEL OPERATOR GAUGES AND SWITCHES

The following ***shall*** be provided:

9.30.1 Pump house heater switch.

9.30.2 Pump panel light switch.

9.30.3 Master gauge test ports.

9.30.4 Pump speed counter drive with cap.

9.30.5 Auxiliary engine cooler control valve.

9.30.6 Pump engagement light.

9.30.7 Primer Control.

9.30.8 Master Drain Valve Control

9.31 WATER LEVEL GAUGE

The following ***shall*** be provided:

9.31.1 A Fire Research model WL2000 Tank Vision water level gauge with LEDindicators ***shall***$^{(E)}$ be provided at the operator pump panel. A wide

view lens over the LEDs ***shall***$^{(E)}$ be provided for a viewing angle of 180 degrees.

9.31.2 The program features ***shall*** be accessed from the front of the indicator module. The program ***shall*** support self-diagnostics capabilities, self-calibration, and a data link to connect remote indicators.

9.31.3 Low water warnings ***shall*** include flashing LEDs at 25% of tank volume, down chasing LEDs when the tank is almost empty, and an output for an audio alarm.

9.31.4 The indicator ***shall*** receive an input signal from an electronic pressure sensor.

9.31.5 The sensor ***shall*** be mounted on the outside, bottom area of the water tank. No probe ***shall*** be placed on the interior of the tank. Wiring ***shall*** be weather resistant and have automotive type plug-in connectors.

9.31.6 The display module ***shall*** be protected from vibration and contamination

9.32 PRESSURE GOVERNOR AND MONITORING DISPLAY

The following ***shall*** be provided:

9.32.1 A Fire Research model In Control pressure governor Series TGA 400 including transmission temperature display and monitoring display kit ***shall***$^{(E)}$ be provided. The kit ***shall*** include a control panel, intake pressure sensor, discharge pressure sensor, buzzer, and cables. The control panel case ***shall*** be waterproof. The panel ***shall*** indicate PSI mode, RPM mode, OK TO PUMP, and IDLE RPM.

9.32.2 Inputs to the control panel from the pump discharge and intake pressure sensors ***shall*** be electrical. The discharge pressure display ***shall*** provide pressure ranges from 0 to 600 psi. The intake pressure display ***shall*** provide pressures from -30 in. Hg to 600 psi.

9.32.3 The program features ***shall*** be accessed via push buttons located on the front of the control panel. The program ***shall*** support manual control of pump discharge pressure and RPM settings, field programmable presets, and diagnostic capabilities.

9.32.4 Safety features ***shall*** include recognition of no water conditions with an automatic programmed response and a push button to return the engine to idle.

9.33 PUMP PANEL LABELS

The following ***shall*** be provided:

9.33.1 All nameplates for discharges, suctions, controls, and gauges ***shall*** be colour coded IAW NFPA 1901 requirements.

9.33.2 All labels ***shall*** be of a permanent type, securely attached to the pump panel and capable of withstanding the effects of extremes of weather and temperature.

9.34 MIDSHIP PUMP

The following ***shall*** be provided:

9.34.1 A pump hour meter ***shall*** be provided at the pump operator's panel.

9.34.2 A Waterous Pump, Model CSU C20 ***shall***$^{(E)}$ be provided.

9.34.3 To eliminate leakage and routine maintenance self-adjusting spring loaded mechanical seals ***shall*** be provided.

9.34.4 Main intake relief valves ***shall*** be provided with a signal light located at the enclosed pump operator's panel to indicate that the relieve valve has opened.

9.34.5 A manifold drain valve ***shall*** be provided, with the control located at the operators pump panel.

9.34.6 A Waterous overheat protection manager ***shall***$^{(E)}$ be provided.

9.34.7 The pump ***shall***$^{(E)}$ be rated to provide a minimum output of 8000 L/min (2000 US GPM) at 150 psi.

9.34.8 The pump ***shall*** be capable of delivering the rated discharge outlined in CAN/CLC-S515-04 as indicated:

9.34.8.1 100% of rated capacity at 1000 kPa (145 PSI) net pump pressure.

9.34.8.2 70% of rated capacity at 1350 kPa (195 PSI) net pump pressure.

9.36.8.3 50% of rated capacity at 1700 kPa (247 PSI) net pump pressure.

9.34.9 The pump when dry ***shall*** be capable of taking suction and discharging water with a lift of 10 feet in not more than 45 seconds through 20 feet of suction hose of the appropriate size. An additional 15 seconds ***shall*** be

allowed to compensate for the auxiliary 4 inch intakes located at the front and rear of the apparatus.

9.34.10 The pump body ***shall***$^{(E)}$ be subjected to a hydrostatic test to a gauge pressure of 500-psi (3400 kPa) minimum for 10 minutes IAW NFPA 1901 standards.

9.34.11 Pump casing ***shall***$^{(E)}$ be high tensile gray iron, with a horizontally split pump casing for easy removal of impeller assembly, including wear rings, without disturbing setting of pump in chassis or pump piping.

9.34.12 A bronze balanced impeller ***shall***$^{(E)}$ be provided.

9.34.13 Replaceable bronze wear rings ***shall***$^{(E)}$ be provided.

9.34.14 A two-piece impeller shaft ***shall***$^{(E)}$ be provided allowing separation of the transmission from the pump without having to disassemble either component. The impeller shaft ***shall*** be stainless steel and supported at each end by ball type oil grease lubricated bearings. Impeller shafts utilizing sleeve bearings or bushings will be considered as non-compliant.

9.34.15 Bearings ***shall*** be provided with protection from water and sediment contamination.

9.34.16 A master pump drain ***shall*** be provided. The drain control ***shall*** be located at the left side exterior pump panel. Additional .75 inch drains with 1/4 turn valves ***shall***$^{(E)}$ be provided as required by design to ensure complete drainage of plumbing.

9.35 PUMP TRANSMISSION

The following ***shall*** be provided:

9.35.1 Housing ***shall***$^{(E)}$ be high tensile gray iron, three pieces, horizontally split. Power transfer to pump ***shall***$^{(E)}$ be through a Morse Hy-Vo drive chain. The chain ***shall***$^{(E)}$ be provided with internal lubrication capability eliminating the requirement for an external oil pump.

9.35.2 Chain sprockets ***shall***$^{(E)}$ be cut from carbonized, hardened alloy steel.

9.35.3 Drive shafts ***shall*** be hardened ground alloy steel. All shafts ***shall*** be ball bearing supported.

9.36 PUMP SHIFT

The following ***shall*** be provided:

9.36.1 The pump shift ***shall***$^{(E)}$ be pneumatically controlled using a power-shifting cylinder. The power shift control valve ***shall*** be mounted in the cab, and labelled "PUMP SHIFT". The apparatus transmission shift control ***shall*** be a positive lever to prevent accidental shifting of the chassis transmission.

9.36.2 A green indicator light ***shall*** be located in the cab labelled "PUMP ENGAGED". The light ***shall*** not activate until the pump shift has completed its full travel into the pump engagement position.

9.36.3 A second green indicator light ***shall*** be located in the cab and be labelled "OK TO PUMP".

9.36.4 A label ***shall*** be provided in the cab within easy view of the driver's position to indicate the chassis transmission shift selector position to be used for pumping.

9.36.5 One pump panel mounted "GREEN" indicator light ***shall*** be provided by the throttle control on the pump operator's panel. The light ***shall*** be energized when the pump shift has been competed and the chassis parking brake is set.

9.36.6 The light on the pump operator’s panel ***shall*** be positioned adjacent and preferably above the throttle control and labelled "WARNING DO NOT OPEN THROTTLE UNLESS LIGHT IS ON."

9.37 PUMP PRIMER

The following ***shall*** be provided:

9.37.1 An oil free rotary vane primer with full automatic priming valve ***shall***$^{(E)}$ be provided with the primer control located at the operators pump panel.

9.37.2 When activated the primer control ***shall*** automatically open the priming valve and activate the primer motor at the same time, thus being a one-hand operation. The primer valve is to be connected to the top of both pump volutes making it possible to prime the pump no matter if the pump is in pressure or volume.

9.37.3 An additional line ***shall*** be connected to the highest point or points between the pump and the front and rear suction inlets to ensure a complete prime.

9.37.4 The priming valve ***shall*** be electronically interlocked to the "Park Brake" circuit to allow priming of the pump before the pump is placed in gear.

10. PUMP SYSTEMS

10.1 PLUMBING AND PIPING GENERAL

The following ***shall*** be provided:

10.1.1 All plumbing for discharge outlets and suction inlets ***shall*** be fabricated/constructed from schedule 10 stainless steel piping or heavy duty high pressure wire reinforced flexible hose with stainless steel couplings.

10.1.2 Victaulic couplings ***shall*** be used on the plumbing lines to take tension off piping and to permit flexing and movement without damage to the pump and its components.

10.1.3 Heavy duty U-bolt clamps and bracing ***shall*** be used on all plumbing lines and connections were required for firm vibration free installation.

10.1.4 Suction inlets and discharge outlets ***shall*** be provided with Storz connections.

10.1.5 Configuration of the Storz adapter connection will be determined at the pre production meeting.

10.2 PUMP MAIN SUCTION INLETS

The following ***shall*** be provided:

10.2.1 A 6" pump manifold inlet ***shall*** be provided on each side of the vehicle with high pressure, long handle chrome-plated caps and screens.

10.2.2 To aid in corrosion protection each inlet ***shall*** be provided with a replaceable zinc element that is installed directly on the pump intake piping and into the pump waterway.

10.2.3 Pump main intake valves ***shall*** be provided with electric butterfly valves with the actuator located at the pump operator’s panel.

10.3 AUXILIARY INLETS - LEFT AND RIGHT SIDES

The following ***shall*** be provided:

10.3.1 One (1) 2-1/2" gated inlet ***shall*** be provided at the left side exterior pump panel area and one (1) at the right side exterior pump panel area. The inlets

shall be provided with 2.5" Akron 1/4-turn ball valves with replaceable balls, seals and "O" rings.

10.3.2 Each inlet valve ***shall*** be installed behind the pump panel and controlled with a heavy duty sealed aircraft type cable and valve controller located at the enclosed operator pump panel.

10.3.3 Each inlet ***shall*** be equipped with a chrome female swivel, screen, chrome plated rocker lug cover, and retaining cable.

10.4 AUXILIARY SUCTION INLETS - FRONT AND REAR

The following ***shall*** be provided:

10.4.1 Two (2) four (4) inch intakes ***shall*** be provided, one (1) located at the right front bumper area, and one (1) located at the left rear (road side) of the apparatus. The suction intakes ***shall*** be provided with Akron four (4) inch butterfly valves meeting the slow close requirements of NFPA 1901.

10.4.2 Each intake valve ***shall*** be installed behind the pump panel with valve controls located at the enclosed operator's pump panel.

10.4.3 The front intake ***shall*** be provided with a chrome 90-degree adapter, chrome plated rocker lug cap, and retaining chain.

10.4.4 The rear intake ***shall*** be a straight through body connection and provided with a chrome rocker lug cap and retaining chain.

10.4.5 The intakes ***shall*** be provided with a 3/4-inch bleeder valve assembly to drain water/air from the line. The bleeder valve ***shall*** be controlled with a quarter turn handle located at the left side exterior pump panel.

10.4.6 The intakes ***shall*** be provided with an adjustable automatic pressure relief device installed on the supply side of the valve to bleed off pressure from a hose connected to the valve intake.

10.5 CROSS LAY HOSE BED

The following ***shall*** be provided:

10.5.1 Two (2) 1 3/4 inch cross lay hose beds ***shall*** be provided and installed transversely above the pump house. Hose bed floors ***shall*** be provided with dry lock panels to allow for water drainage and air movement under the hose. Each hose bed storage ***shall*** be of sufficient size to accommodate 200-feet of 1 3/4 double-jacket fire hose pre-connected to the pump discharge. The cross lay hose beds ***shall*** be constructed entirely from

aluminum. The interior finish ***shall*** provide a smooth surface that is free from all projections, such as nuts, sharp angles, or brackets that might cause damage to the hose. (see Item 9.2.1 for the main hose bed)

10.5.2 Each cross lay section ***shall*** include one 2-inch brass swivel with a 1 3/4-inch NST male hose connection with Storz adapter to permit use of the hose from either side of the apparatus.

10.5.3 Stainless steel rollers with nylon guides set in aluminum extrusions ***shall*** be installed horizontally and vertically on each end of the cross lay.

10.5.4 The cross lay piping ***shall*** consist of two 2-inch heavy-duty hoses from the pump discharge manifold to the 2-inch swivels. Each cross lay discharge ***shall*** include a manually operated 2-inch Akron style valve. The valve control ***shall*** be located at the pump operator's panel.

10.5.5 Each cross lay ***shall***$^{(E)}$ have an Akron 2", 1/4 turn ball valve with replaceable ball, seal, and "O" rings. The valve ***shall*** have a self-locking ball feature using an automatic friction lock design to balance the brass ball when in a throttle position and water is flowing through it.

10.5.6 The valve ***shall*** be a swing out design to allow the valve body to be removed for servicing without disassembling the plumbing.

10.5.7 Each cross lay discharge ***shall***$^{(E)}$ be provided with an FRC Insight pressure/flow meter colour coded IAW NFPA 1901, Table A 18.9.1 standards and mounted at the enclosed pump panel adjacent to the valve control.

10.6 DIGITAL FLOW METER

The following ***shall*** be provided:

10.6.1 A Fire Research Insight flow meter ***shall***$^{(E)}$ be provided with readings in litres per minute.

10.6.2 The flow meter ***shall*** be plumbed and calibrated to the deck gun discharge.

10.6.3 Flow meter program features ***shall*** be accessed via push buttons on the front of the module. The program ***shall*** support multiple calibration points to correct for nonlinear flow, set points for high and low flow warnings, and summing and totalizing functions. The flow meter ***shall***$^{(E)}$ be able to communicate with other FRC Insight flow meters over a data link.

10.6.4 The flow meter ***shall*** be located at the enclosed pump operator’s panel.

10.7 2.5 INCH SIDE PUMP PANEL DISCHARGES

The following ***shall*** be provided:

10.7.1 Two (2) 2.5 inch gated discharges ***shall*** be provided, one (1) at the left side pump panel, and one (1) at the right pump panel. These discharges ***shall***$^{(E)}$ be provided with Akron 2.5 inch 1/4 turn ball valve with replaceable ball, seals and "O" rings.

10.7.2 Each discharge valve ***shall*** be installed behind the pump panel with controls located at the enclosed operator's pump panel.

10.7.3 Each discharge ***shall*** be equipped with a chrome 30-degree adapter, chrome plated rocker lug cap, and retaining chain.

10.7.4 Each discharge ***shall***$^{(E)}$ be provided with an FRC Insight pressure/flow meter colour coded IAWNFPA 1901, table A18.9.1 standards and mounted at the enclosed pump panel adjacent to the valve control.

10.8 2.5 INCH RIGHT REAR DISCHARGE

The following ***shall*** be provided:

10.8.1 One (1) 2.5 inch gated discharge ***shall*** be provided at the upper rear road side area of the apparatus body and one discharge located at the curb side pump panel. The discharges ***shall*** be provided with an Akron 2.5 inch 1/4 turn ball valve with replaceable ball, seals and "O" rings.

10.8.2 The discharge valves ***shall*** be installed behind the pump panel with controls located at the enclosed operator's pump panel.

10.8.3 The discharges ***shall*** be provided with a chrome 30-degree adapter, chrome plated rocker lug cap, and retaining chain.

10.8.4 The discharges ***shall*** be provided with a 3/4-inch bleeder valve assembly to drain water from the pressure line to prevent freezing of the line. The bleeder valve ***shall*** be controlled with a quarter-turn handle on the pump panel.

10.8.5 The discharges ***shall***$^{(E)}$ be provided with an FRC Insight pressure/flow meter colour coded IAWNFPA1901, table A18.9.1 standards and mounted at the enclosed pump panel adjacent to the valve control.

10.9 FOUR INCH DISCAHRAGE

The following ***shall*** be provided:

10.9.1 One four (4) inch discharges ***shall*** be provided. The discharge ***shall***$^{(E)}$ be located a right rear (curb side) upper area of the apparatus body. The discharge ***shall***$^{(E)}$ be provided with Akron four (4) inch butterfly valves meeting the slow close requirements of NFPA 1901.

10.9.2 The discharge valve ***shall***$^{(E)}$ be provided with electric actuators and 9315 Akron Navigator valve controllers with pressure and flow readings. Valve controllers ***shall*** be provided at the pump operator's panel.

10.9.3 The discharge ***shall*** be provided with a chrome 30-degree adapter, chrome plated rocker lug cap, and retaining chain.

10.9.4 The discharge ***shall*** be provided with a 3/4-inch bleeder valve assembly to drain water from the pressure line to prevent freezing of the line. The bleeder valve ***shall*** be controlled with a quarter-turn handle on the pump panel.

10.10 DECK GUN

The following ***shall*** be provided:

10.10.1 An Akron Deck Master 12 volt monitor with a Saber Master nozzle and wireless remote control function (meeting the requirements of NFPA1901) ***shall***$^{(E)}$ be provided. Additionally, a spare remote control ***shall*** be provided with the apparatus.

10.10.2 A storage compartment to house the remote control unit ***shall*** be provided at the enclosed operators pump panel area.

10.10.3 The Deck Master monitor ***shall***$^{(E)}$ be provided with three (3) inch plumbing and an electrically operated Akron valve and a model 9315 Navigator Valve Controller with pressure and flow readings.

10.10.4 The deck gun discharge ***shall*** be located above the pump house compartment. The piping ***shall*** be rigidly braced and secured so no movement develops when the line is charged.

10.10.5 The Navigator Valve Controller located at the enclosed operators pump panel.

10.10.6 The valve ***shall***$^{(E)}$ be an Akron Swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

10.10.7 The valve design ***shall*** incorporate a slow close operation IAW with NFPA 1901.

10.10.8 The discharge ***shall*** be provided with a 3/4-inch bleeder valve assembly installed to drain water from the gauge pressure line to prevent freezing of the line. The drain ***shall*** be controlled with a quarter-turn valve on the pump panel.

10.11 FRONT JUMP LINE PACKAGE

The following ***shall*** be provided:

10.11.1 Front Tray – A hose storage tray ***shall*** $^{(E)}$ be recessed into the front bumper extension and constructed from 1/8-inch aluminum plate. The compartment design ***shall*** allow for a storage capacity to hold 100 feet of 2 ½ -inch DJ hose. Extruded aluminum slats ***shall*** be provided in the bottom of the tray to allow water to drain away from the hose. The compartment ***shall*** $^{(E)}$ be equipped with a 1/8-inch aluminum diamond plate hinged lid and two 1/4 turn locking mechanisms.

10.11.2 Discharge - A 2½-inch pre-connect outlet with an Akron ball valve and Model 9315 Navigator electric valve controller with pressure meter ***shall*** $^{(E)}$ be provided. The discharge ***shall*** be located and centered down low in the back wall of the hose tray. The valve control ***shall*** be located at the enclosed operator's pump panel and visually indicate the position of the valve at all times.

10.11.3 The valve ***shall*** $^{(E)}$ be an Akron Swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

10.11.4 An Akron Mercury Nozzle model 4447 with a Mercury quick attack 3443 monitor and mounting bracket ***shall*** $^{(E)}$ be provided.

10.11.5 The pre-connect ***shall*** $^{(E)}$ consist of a heavy-duty hydraulic hose coming from the pump discharge manifold to a 3-inch NPT x 2½-inch Storz mechanical swivel hose connection to permit the use of the hose from either side of the apparatus.

10.11.6 The discharge ***shall*** be provided with a 3/4-inch bleeder valve assembly installed to drain water from the pressure line to prevent freezing of the line. The drain ***shall*** be controlled with a quarter-turn valve on the pump panel.

10.11.7 An air blow-out valve, controlled at the enclosed operator's pump panel, ***shall*** be installed between chassis air reservoir and front jump line.

10.12 PUMP TO TANK FILL

The following ***shall*** be provided:

10.12.1 A two (2) inch Akron valve with stainless steel plumbing ***shall***$^{(E)}$ be installed between the pump discharge and booster tank to provide tank-filling capability.

10.12.2 The valve ***shall***$^{(E)}$ be an Akron 8800HD series with a chrome-plated brass ball.

10.12.3 The valve controller ***shall***$^{(E)}$ be an Akron Electric valve controller Model 9315 located at the enclosed operator's pump.

10.13 TANK TO PUMP SUPPLY LINE

The following ***shall*** be provided:

10.13.1 A four (4) inch tank supply line ***shall*** be provided from the tank to the pump.

10.13.2 The tank supply line ***shall***$^{(E)}$ be provided with a four (4) inch Akron swing out valve and model 9315 Navigator valve controller located at the enclosed at the pump operator's panel.

10.13.3 An automatic means ***shall*** be provided in the tank to pump line to prevent unintentional backfilling of the water tank.

10.14 DRAIN VALVES

The following ***shall*** be provided:

10.14.1 Drain valves ***shall*** be provided for intakes and discharges.

10.14.2 Drain valves ***shall*** be positioned horizontally on the forward edge of the left side outer pump panel

10.14.3 All drain vales ***shall*** be provided with permanent labels to indicated function.

11. FOAM PRO SYSTEM

11.1 GENERAL DESIGN

The following ***shall*** be provided:

11.1.1 A fully automatic Foam Pro 2001 electronic direct injection foam proportioning system ***shall***$^{(E)}$ be provided for the cross lays and trash line discharges.

11.1.2 The system ***shall*** be capable of discharging Class A foam concentrates and most Class B foam concentrates.

11.1.3 The proportioning operation ***shall*** be based on an accurate direct measurement of water flows with no water flow restriction and meet NFPA standards for foam proportioning systems.

11.1.4 The system ***shall*** be provided with a digital electronic control display at the enclosed pump operator's panel to enable the pump operator to perform the following control and operation functions:

11.1.4.1 Activate the foam system.

11.1.4.2 Change foam concentrates proportioning rates from.1%to 3%in .1% increments.

11.1.4.3 Show current flow in lpm preferable or gpm acceptable, show total volume of water pump, and show total amounts of foam concentrate used.

11.1.4.4 Provide simulated flow for manual operation.

11.1.4.5 Perform set-up and diagnostic functions.

11.1.4.6 Flash a "low concentrate" warning for two minutes when the foam concentrate tank(s) run low of concentrate.

11.1.4.7 Flash "no concentrate" warning if foam concentrate tank was not changed or foam concentrate was not added to the low tank and shut down foam concentrate pump.

11.1.4.8 Display which foam concentrate tank is selected.

11.1.4.9 Separate default setting for foam concentrate injection rate.

11.1.4.10 Display the total amount of foam concentrate used from the selected tank.

11.2 A/B FOAM SELECTOR

The following ***shall*** be provided:

11.2.1 A Manual Dual Tank System ***shall*** be provided for switching from foam concentrate Tank "A" to foam concentrate Tank "B" via a manual valve located at or near the enclosed operator's pump panel. The valve ***shall*** be capable of operating pressures up to 500-psi.

11.2.2 The dual tank valve ***shall*** also provide a clean water flush of the foam concentrate pump upon foam tank change over, to prevent concentrate mixing and possible jellying.

11.2.3 The system ***shall*** automatically read the selected foam concentrate tank low level sensor and display the appropriate default setup in the operator display control.

11.3 FOAM TANK LEVEL GAUGE

The following ***shall*** be provided:

11.3.1 An FRC foam tank level gauge ***shall***$^{(E)}$ be provided and located at the enclosed operator's pump panel.

11.3.2 The gauge ***shall*** provide a high visibility display of the foam tank foam level. The display module ***shall*** form an inverted "V" pattern allowing the Full, 3/4, 1/2, 1/4, and Refill levels to be easily distinguished at a glance.

11.3.3 The design of the sensing probe ***shall*** prevent fluid entry into the probe and eliminate cleaning procedures commonly associated with level measuring probes. Internal electronics ***shall*** be protected with encapsulated plastic.

11.3.4 The display ***shall*** provide a steady indication of fluid level.

11.4 FOAM DISTRIBUTION TEST KIT

The following ***shall*** be provided:

11.4.1 The vehicle ***shall***$^{(E)}$ be equipped with a No Foam Kit that is designed to allow the foam distribution system to be periodically tested without discharging a foam solution.

11.5 FOAM SYSTEM DISCHARGE MANIFOLD

The following ***shall*** be provided:

11.5.1 A brass foam discharge manifold ***shall*** be provided for the foam system.

11.5.2 The foam manifold ***shall*** have three (3) outlets for connection into the apparatus plumbing system.

11.6 INTEGRAL FOAM TANKS

The following ***shall*** be provided:

11.6.1 The apparatus booster tank ***shall*** be provided with two (2) integral foam tanks with associated piping to feed the foam system.

11.6.2 The tanks ***shall*** be provided with separate fill towers with a cover labelled "FOAM FILL ONLY". The tank covers ***shall*** be provided with labels to clearly identify the foam concentrate contained in each tank.

11.6.3 Each tank ***shall*** have the capacity to support a full load of water. Suggested capacity per tank, 113.5 L (30 gallons)

11.7 BOOSTER TANK

The following ***shall*** be provided:

11.7.1 A "T" shaped 1,000-US gallon booster tank constructed of 1/2-inch black UV stabilized copolymer polypropylene ***shall*** be provided.

11.7.2 Tank construction ***shall*** utilize the latest thermo plastic welding technology such as a clean, hot air controlled temperature process that ensures that the weld reaches its plasticized state without cold or hot spots.

11.7.3 The tank ***shall*** undergo extensive testing prior to installation in the truck. The process ***shall*** include an electronic spark and water fill test after both the internal and external tank shell welds are completed.

11.7.4 The tank ***shall*** have a combination vent and a manual fill tower located in the left front comer of the tank. The tower ***shall*** have a hinged cover and a 1/4- inch thick polypropylene screen. The tank overflow ***shall*** be 4-inch diameter and dump behind the rear wheels.

11.7.5 There ***shall*** be two standard tank openings; one for the tank to pump suction line with an anti-swirl plate and one for a tank fill line.

11.7.6 Both longitudinal and latitudinal baffles ***shall*** be interlocking and thermo welded to minimize water surge during travel. Openings in the baffles s***hall*** be positioned to allow water flow to NFPA standards during filling or pumping operations.

11.7.7 The tank ***shall*** be mounted on hard rubber cushions to isolate the tank from road shock and vibration and be completely removable without disturbing or dismounting the apparatus body structure.

11.7.8 The tank ***shall*** be provided with a 1.5-inch tank drain installed in the bottom of the tank and accessible from the ground.

12. CERTIFICATION AND TESTING

12.1 PUMP

Pump certification and testing ***shall*** be conducted IAWCAN/ULC-S5 15-04 standards, the following ***shall*** be provided:

12.1.1 A third party company holding ULC test certification ***shall*** conduct ULC testing of the pump system IAW paragraph 15.3.1 thru 15.3.9 of S515-04.

12.1.2 A test plate, installed at the pump panel, ***shall*** provide the rated discharges and pressures together with the speed of the engine as determined by the certification test, and the no-load governed speed of the engine.

12.1.3 A Certificate of Inspection certifying performance of the pump and all related components ***shall*** be provided at time of delivery. Additional certification documents ***shall*** include, but not limited to, Certificate of Hydrostatic Test, Electrical System Performance Test and Certificate of Pump Performance from the pump manufacturer.

13. EQUIPMENT SUPPORT PACKAGE

13.1 FIRE SUPPORT EQUIPMENT

The following ***shall***$^{(E)}$ be provided:

13.1.1 An Alco-Lite PRL-14, 14-foot roof ladder mounted on the ladder brackets. The ladder ***shall*** be equipped with folding steel roof hooks on one end and steel spikes on the other.

13.1.2 An Alco-Lite PEL-24, 24-foot, two-section extension ladder mounted on the ladder brackets.

13.1.3 An Alco-Lite 10-foot folding attic ladder with mounting brackets mounted on the officer's side compartment top. Both ends of the ladder ***shall*** be equipped with moulded rubber feet and carrying handles.

13.1.4 A 6-lb. steel, flat head axe with fibreglass handle and mounting bracket.

13.1.5 Should the axe be mounted on an exterior body location the mounting brackets provided ***shall*** be chrome plated.

13.1.6 A 6-lb. steel, pick head axe with fibreglass handle and mounting bracket. Should the axe be mounted on an exterior body location the mounting brackets provided ***shall*** be chrome plated.

13.1.7 A 10-foot hollow fibreglass pike pole, 13/4-inch OD, with a painted steel pike and mounting bracket mounted inboard of the attic ladder on the officer's side compartment top.

13.1.8 A chrome barrel strainer that will fit a 6-inch NST hard suction hose.

13.1.9 Two 10-feet x 6-inch lightweight hard suction hose with strainers.

13.1.10 Two hard suction racks, constructed of extruded aluminum and be designed to hold a 10-foot section of 6-inch hard suction hose. Spring mounted latch handles ***shall*** secure the hose.

13.1.11 The Hard Suction Racks ***shall*** be mounted on the driver side above the compartments.

13.1.12 Storage and tie down points ***shall*** be provided on the top rear body area for stowage of a Stokes stretcher.

13.1.13 Two Akron Super spanner wrench sets Model SS-MP ***shall***$^{(E)}$ be provided. One set provided at the left exterior pump panel and one set provided at the right exterior pump panel.

13.2 MISCELLANEOUS APPARATUS EQUIPMENT

The following ***shall*** be provided:

13.2.1 Three triangular warning reflectors complete with storage case.

13.2.2 An ABC rated fire extinguisher, minimum 2.3-kgs (5-lbs) complete with a quick release-mounting bracket. The exact mounting location of the fire extinguisher will be determined at the pre-production meeting.

13.2.3 Two front and two rear tow hooks/eyes or loops of sufficient strength to permit the recovery of the fully loaded vehicle.

13.2.4 Front and rear license plate holders.

13.2.5 Unmarked mud flaps behind the front and rear wheel assemblies.

13.2.6 Spare tire and rim assembly, the following applies:

13.2.6.1 If the front and rear tires are different thread patterns, one spare tire assembly shall be provided per axle.

13.2.6.2 A spare tire and rim assembly ***shall*** be provided as an operationally useable assembly and shipped as a loose item.

13.2.6.3 The apparatus ***shall*** be provided with the required tire changing tools to facilitate roadside replacement of a wheel assembly and include a heavy- duty jack capable of lifting the loaded vehicle.

14. PAINT CORROSION PROTECTION AND DECALING

14.1 PAINT FINISH

The following ***shall*** be provided:

14.1.1 The vehicle including the cab, chassis and utility body ***shall*** be painted in accordance with the paint manufacturer's recommendations and the manufacturer's best production procedures, rendering a durable finish and a smooth appearance free from runs, sag and orange peel.

14.1.2 The finish ***shall*** consist of a corrosion-prevention pre-treatment to all bare metal, a sealer/primer, two coats of base colour, and two coats of clear finish.

14.1.3 The aluminum cab and body ***shall*** have no mounted components prior to painting to assure full coverage of metal treatments and paint. Any vertically or horizontally hinged smooth-plate compartment door ***shall*** be painted separately to assure proper paint coverage on the body, doorjambs, and door edges.

14.1.4 The paint process ***shall***$^{(E)}$ feature Akzo-Nobel's high-solid LV products, process, and performed in the following steps:

14.1.4.1 Corrosion Prevention - All raw materials ***shall***$^{(E)}$ be pre-treated with the Weather Jacket Corrosion Prevention system to provide superior corrosion resistance and excellent adhesion of the topcoat.

14.1.4.2 Akzo-Nobel Sealer/Primer LV- Acrylic urethane sealer/primer ***shall***$^{(E)}$ be applied to guarantee excellent gloss holdout, chip resistance, and a uniform base colour.

14.1.4.3 Akzo-Nobel High Solid LV (Top coat) - A lead free, chromate-free, high- solid acrylic urethane topcoat ***shall***$^{(E)}$ be applied, providing excellent coverage and durability. A minimum of two coats ***shall*** be applied.

14.1.4.4 Akzo-Nobel High Solid LV (Clear coat) - A high-solid LV clear coat ***shall***$^{(E)}$ be applied as the final step in order to ensure full gloss and colour retention and durability. A minimum of two coats ***shall*** be applied.

14.1.5 Any location where aluminum is penetrated after painting for the purpose of mounting steps, handrails, doors, lights, or other specified components ***shall*** be treated at the point of penetration with a corrosion inhibiting pre-treatment. The pre-treatment ***shall*** be applied to the aluminum sheet metal or aluminum extrusions in all locations where the aluminum has been penetrated. All hardware used in mounting steps, handrails, doors, lights, or other specified components ***shall*** be individually treated with the corrosion inhibiting pre-treatment.

14.1.6 The chassis frame and undercarriage components ***shall*** be painted black.

14.2 TWO-TONE CHASSIS PAINT

The cab ***shall*** be provided with a two tone paint finish. The following applies:

14.2.1 The upper area of the cab ***shall***$^{(E)}$ be painted FLNA 4006 White Akzo-Nobel lead-free, chromate-free high solid LV acrylic urethane paint.

14.2.2 The paint break line will be determined at the pre-production meeting.

14.2.3 The paint break ***shall*** be provided with a ¾-inch black and gold stripe; ½-inch gold stripe with a ⅛-inch black outline on both sides with a clear polyurethane coating. The stripe ***shall*** contour with the chassis, following and covering the two-tone paint break.

14.3 DECALING PACKAGE

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

14.3.1 The apparatus identification number ***shall*** be affixed to the left and right front corners of the cab, and front door assemblies centered and sized IAW door dimensions.

14.3.2 In an arched format above the vehicle number a Base identifier ***shall*** be provided in bilingual format. Immediately below the vehicle number in a horizontal format will be "FIRE SERVICE D'INCENDIE".

14.3.3 A Canadian Maple leaf decal ***shall*** be provided on both rear door/window areas using a perforated decal type material that allows visibility from the interior of the cab.

14.3.4 The apparatus number ***shall*** also be affixed to the top of the apparatus, the location and size ***shall*** be IAW design limitations.

14.3.5 The CF Base identifier/crest ***shall*** be affixed to the rear cab doors and B1 compartment sized IAW door dimensions. The B1 compartment crest ***shall*** be manufactured from a reflective material.

14.3.6 The rear beaver tail sections ***shall*** be provided with red and yellow chevrons IAW NFPA 1901 requirements.

14.3.7 A DND logo ***shall*** be affixed to the front upper section of the rear body.

14.3.8 The logo “EMERGENCY SERVICES D’URGENCE” ***shall*** be provided on both sides of the apparatus body centered above the rear wheels.

14.3.9 A Fire Fighter ribbon ***shall*** be provided at both upper sections of the cab located to the rear of the front doors.

14.3.10 The lower rear compartment door ***shall*** be provided with a decal indicating “911”

14.3.11 A four (4) inch white reflective stripe ***shall*** be provided on the left and right side of the apparatus with a one (1) inch contrasting coloured reflective stripe located above and below the four (4) inch stripe.

14.3.12 Reflective striping ***shall*** meet the required standard of NFPA 1901, Section 15.9.3.

14.3.13 Details of the decaling package will be finalized at the pre-production meeting.

14.4 CAB AND CHASSIS CORROSION PROTECTION SYSTEM

The cab, chassis and Fire Fighting package ***shall*** be provided with a rust proofing application.

The following applies:

14.4.1 The treatment will be provided prior to delivery of the apparatus. .

14.4.2 The treatment ***shall*** have the following properties:

14.4.2.1 Moisture displacing.

14.4.2.2 Creeping (capillary action).

14.4.2.3 Low solvent content.

14.4.2.4 Compatibility with rubbers, plastics and all other materials used in automotive construction.

14.4.2.5 Non-toxic.

14.4.2.6 Minimal dripping.

14.4.3 Written proof of a twelve hour ASTM B117 salt spray endurance test certification by an independent test laboratory. Krown Rust Control and Rust Check products have been accepted as certified, proof not required.

14.4.4 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.

14.4.5 A decal indicating the treatment name/company and warranty papers ***shall*** accompany each vehicle at time of delivery.

14.5 CORROSION RESISTANT MATERIALS

The following applies:

14.5.1 All fasteners used in the construction of the apparatus for either fastening or attachment purposes ***shall*** be made of stainless steel.

14.5.2 Fastener application that is designed for direct threading into structural components ***shall*** be provided with either threaded inserts which are securely anchored into the sub structure or provided with an installation process that incorporates drilling, tapping and application of non-corrosive grease before the stainless steel bolts are installed.

14.5.3 The use of rivets and self-tapping screws in the construction of the apparatus ***shall*** not be acceptable with the exception of exterior name as per Specification Item 15.2.

14.5.4 The design of the vehicle ***shall*** prevent galvanic corrosion. The contact surfaces of dissimilar metals ***shall***$^{(E)}$ be provided with a non-absorbent polypropylene tape/gasket of 1.7 mils minimum thickness with a dielectric strength of 300-400 volts/mil. The taped area ***shall*** be of sufficient size to

provide a dielectric barrier for the immediate and surrounding contact application area.

15. TECHNICAL DATA AND ILS

15.1 IDENTIFICATION PLATE

The following information ***shall*** be provided as a minimum, permanently marked and in a conspicuous and protected location:

15.1.1 Vehicle identification number.

15.1.2 GAWR and GVWR.

15.1.3 The manufacturer's CMVSS certification sticker.

15.1.4 A data plate containing metric and imperial fluid/oil type and capacity as per NFPA 1901-2009 Fluids.

15.2 WARNING AND INSTRUCTION PLATES

The following applies:

15.2.1 All warning and identification plates provided on the exterior of the apparatus ***shall*** be fabricated from a plastic type material and ***shall*** be held in location by rivets.

15.2.2 All warning and identification plates provided on the interior of the apparatus ***shall*** be fabricated from a plastic type material. It is desirable that interior warning and identification plates are fastened utilizing rivets.

15.2.3 All plates ***shall*** be within easy view of the user.

15.2.4 Instructions for engine starting, transmission operation and any other special procedures to be followed ***shall*** be provided.

15.2.5 International symbols and/or bilingual markings ***shall*** be provided.

15.3 PHOTOGRAPHS, SLIDES AND SKETCHES

The contractor ***shall*** supply the following high-resolution digital files on CDROM (TIF or JPG), of the completed vehicle. All photographs ***shall*** be taken against a plain background:

15.3.1 Left front three-quarter view of a completed unit.

15.3.2 Right rear three-quarter view of a completed unit.

15.4 SAFETY RECALLS AND SERVICING DATA

The following information ***shall*** be sent to the final delivery locations and to the Technical Authority, on a continuing basis, throughout the expected life of the vehicle (15 years):

15.4.1 Safety recalls.

15.4.2 Manufacturer's technical service bulletins.

15.5 REPLACEMENT PARTS INFORMATION

The manufacturer ***shall*** forward all information pertaining to a change in replacement parts to the Technical Authority, on a continuing basis, throughout the expected life of the vehicle (15 years).

15.6 BID PACKAGE INFORMATION

The following ***shall*** be provided:

15.6.1 The contractor ***shall*** supply a line set ticket with the bid submission. If the apparatus tendered is a prototype design, the line set ticket ***shall*** be provided prior to the pre-delivery inspection.

15.6.2 A brochure of the vehicle or of the vehicle on which the tender is based.

15.6.3 Details on the warranty, including all separate component warranties.

15.6.4 A listing of all applicable operator, maintenance and parts manuals.

15.6.5 Certified performance curves of the pump showing flow, pressure and horsepower requirements.

15.6.6 Front, side and rear elevation sketches of the apparatus.

15.6.7 The technical data requested in the questionnaire ***shall*** be provided and in a typed format.

15.6.8 Units of measurement ***shall*** be clearly indicated.

15.6.9 The questionnaire ***shall*** be signed by an authorized representative of the contractor.

15.7 LOOSE MATERIAL SHIPMENT LIST

Prior to delivery of the apparatus, the contractor ***shall*** supply the Technical Authority with a detailed listing of loose equipment and material that will be shipped with the apparatus.

15.8 DATA SUMMARY

Prior to delivery of the apparatus, the contractor ***shall*** submit a complete vehicle Data Summary to the Technical Authority for approval detailing dimensional data, weights and technical information for the apparatus major and sub systems. DND ***shall*** supply a Data Summary template and explain document details at the pre-production meeting. Should a prototype apparatus be tendered and the provision of a data summary is not available at the time of delivery, the contractor ***shall*** provide the Data Summary to the Technical Authority within a 30 day time frame following DND receiving the apparatus who will distribute the document to the Base(s).

15.9 PREVENTATIVE MAINTENANCE REPLACEMENT PARTS KIT LIST

Prior to delivery of the apparatus, the OEM ***shall*** submit to the Technical Authority a preventive maintenance replacement parts kits list required to support operator level routine maintenance on the apparatus. Should a prototype apparatus be tendered and the provision of a spare parts listing is not available at the time of delivery, the contractor ***shall*** provide the document to the Technical Authority within a 30 day time frame following DND receiving the apparatus. DND will exercise at their discretion the option to call up spare parts listed for the apparatus. The following applies:

15.9.1 Spare parts ***shall*** be listed by apparatus system i.e. Fire Fighting system, piping, valves, etc.

15.9.2 Spare parts ***shall*** be provided with an OEM picture description, OEM part number and applicable unit cost.

15.9.3 The spare parts listing ***shall*** be based on a requirement to support the apparatus in an isolated area for a one (1) year time frame.

15.10 RECOMMENDED SPARE PARTS LIST

Prior to delivery of the apparatus, the OEM ***shall*** submit to the Technical Authority a recommended spare parts list. Should a prototype apparatus be tendered and the provision of a spare parts listing is not available at the time of delivery, the contractor ***shall*** provide the document to the Technical Authority within 30 days of DND receiving the apparatus. DND will exercise at their discretion the option to call up spare parts listed for the apparatus. The following applies:

15.10.1 Spare parts listings ***shall*** cover all major and sub systems of the Fire Fighting package, including fire fighting systems and sub-systems,

lighting, turret systems and compartments and hardware installed by the manufacturer.

15.10.2 Spare parts ***shall*** be provided with an OEM picture description, part number and applicable unit cost.

15.10.3 The spare parts listing ***shall*** be based on a requirement to support the apparatus in an isolated area for a one (1) year time frame.

15.10.4 The spare parts listing ***shall*** be based on historical OEM technical failure data.

15.10.5 In the event that the apparatus offered is of a prototype design the parts listing ***shall*** be based on historical OEM technical failure data for similar type apparatus.

15.11 OPERATOR /TECHNICAL MAINTENANCE AND PARTS MANUALS

Prior to delivery of the apparatus, the OEM ***shall*** submit to the Technical Authority one (1) copy of the operator, technical maintenance and parts manuals and apparatus specific wiring diagram for review and approval of format. The Technical Authority will provide approval or comments on the manuals within 30 calendar days. Once approved, the OEM ***shall*** provide three (3) copies of all manuals with delivery of each apparatus. Two (2) copies per vehicle of all manuals delivered to the CFB Base destination and one (1) copy (total of one) of all manuals delivered to DSVPM. Should a prototype be tendered and the provision of Manuals is not available at the time of delivery, provisional manuals ***shall*** accompany the vehicle/equipment. Provisional manuals ***shall*** be clearly identified with the word “PROVISIONAL”. Provisional manuals ***shall*** be replaced with approved manuals within 30 days following approval. Manuals in either an electronic format or hard copy are acceptable. The following applies:

OPERATOR MANUALS:

15.11.1 Operator’s manuals ***shall*** provide recommended procedures for servicing all apparatus systems.

15.11.2 Warnings and cautions pertaining to the operation and maintenance of the apparatus systems.

15.11.3 A detailed description covering the operation of all apparatus systems.

15.11.4 Operator manuals ***shall*** be in a bilingual English/French format.

MAINTENANCE AND PARTS MANUALS:

OEM Maintenance Repair and parts manuals ***shall*** be provided, the following applies:

15.11.5 Maintenance manuals ***shall*** provide all charts, tables, checklists, and illustrations relating to lubrication, cleaning, troubleshooting, diagnostics, and inspections of major components, sub-assemblies and auxiliary equipment and systems.

15.11.6 Complete maintenance instructions ***shall*** be provided, covering removal, replacement, repair, and adjustment of major components, sub-assemblies and auxiliary equipment and systems.

15.11.7 Parts manuals ***shall*** be provided, and contain a picture description with an OEM part number cross reference listing for all major apparatus systems and sub assemblies/systems.

15.12 ELECTRONIC MANUALS

Manuals supplied in electronic format ***shall*** provide the equivalent information as outlined for hard copy type manuals and be configured/formatted in such a manner to provide for the following:

15.12.1 Printing of the entire manual.

15.12.2 Cutting, pasting or copying of individual documents or sections to other electronic media, such as electronic mail and memos.

15.12.3 Inclusion of a find feature to allow for searches by text or by part number.

15.13 APPARATUS SPECIFIC WIRING DIAGRAMS

Wiring diagrams ***shall*** provide and clearly detail interfacing and routing of the manufacturer's electrical circuit(s) with the cab and chassis OEM electrical system.

15.14 OPERATOR FAMILIARIZATION TRAINING PROGRAM

The OEM ***shall*** provide operator familiarization training at the CF Base delivery destination as follows:

15.14.1 Operator training ***shall*** consist of a two (2) day duration course.

15.14.2 The operator's course ***shall*** cover equipment operation and location/description of the main fire fighting package systems. Particular attention ***shall*** be given to safety related aspects of the apparatus.

15.14.3 The course ***shall*** be designed to accommodate eight students.

15.14.4 The manufacturer ***shall*** ensure that the Factory Rep is fully trained and functional on all aspects of the fire fighting package. The Manufacturer ***shall*** provide proof that the Factory Rep has at least three (3) years current experience within the past five (5) years on the specific apparatus or an apparatus of similar design.

15.15 TECHNICIAN FAMILIARIZATION TRAINING PROGRAM

The OEM ***shall*** provide technician familiarization training at the CF Base delivery destination as follows:

15.15.1 Technician training ***shall*** consist of a two-day duration course.

15.15.2 The technician's course ***shall*** cover operation, identification and familiarization with the fire fighting package systems and sub systems, with particular attention given to safety related aspects of the apparatus.

15.15.3 Servicing, adjustment and diagnostic procedures ***shall*** be covered for the main systems of the fire fighting package.

15.15.4 A thorough familiarization on the fire fighting package and electrical (Multiplex) system ***shall*** be provided.

15.15.5 The manufacturer ***shall*** ensure that the Factory Rep is fully trained and functional on all aspects of the fire fighting package. The Manufacturer ***shall*** provide proof that the Factory Rep has at least three (3) years current experience within the past five (5) years on the specific apparatus or an apparatus of similar design.

15.16 OPERATOR TRAINING AIDS

To assist within house training activities the following schematics ***shall*** be provided:

15.16.1 Schematics ***shall*** be approximately four (4) feet wide by three (3) feet high.

15.16.2 Schematics ***shall*** be provided for the apparatus piping system, engine, drive train components, mid-ship pump and operators enclosed pump panel.

15.16.3 Schematics ***shall*** be produced on a heavy quality paper and provided with a laminate finish.

15.17 IDENTIFICATION PLATE

The following ***shall*** be provided:

15.17.1 The plate ***shall*** be permanently marked and located in a conspicuous and protected location.

15.17.2 The plate ***shall*** contain the following information as a minimum:

15.17.2.1 The name of the manufacturer.

15.17.2.2 Apparatus make, model, year and serial number.

15.17.2.3 Rim, tire and tire pressure.

15.17.2.4 GAWR of the front and rear axles.

15.17.2.5 Vehicle dimensions

15.18 WARNING AND INSTRUCTION PLATES

The following ***shall*** be provided/applies:

15.18.1 All plates ***shall*** be within easy view of the user.

15.18.2 Instructions for engine starting, transmission operation and any other special procedures to be followed ***shall*** be provided.

15.18.3 International symbols and/or bilingual markings ***shall*** be provided.

15.19 LUBRICANTS AND FLUIDS

The vehicle ***shall*** be serviced with standard lubricants and fluids compatible with the delivery location and season.

15.20 LINE SETTING TICKET

Prior to delivery of the apparatus, the OEM ***shall*** submit to the Technical Authority a complete line setting ticket. A copy of the line setting ticket ***shall*** accompany each vehicle. ***Shall*** a prototype apparatus be tendered and the provision of the line setting ticket is not available at the time of delivery, the contractor ***shall*** provide the line setting ticket to the Technical Authority within 30 days of DND reception the apparatus.

15.21 SAFETY RECALLS AND SERVICING DATA

The following information ***shall*** be sent to the final delivery locations (if known) and to the Technical Authority, on a continuing basis, throughout the expected life of the vehicle (15 years):

15.21.1 Safety recalls.

15.21.2 Manufacturer's technical service bulletins.

15.21.3 Information pertaining to a change in replacement parts to the Technical Authority and CF Base of delivery, on a continuing basis throughout the expected life of the vehicle (15 years).

16. APPARATUS DIAGNOSTIC EQUIPMENT AND SOFTWARE

The following diagnostic equipment and software ***shall*** be provided to enable trouble shooting and diagnosis of vehicle system faults:

16.1 DIAGNOSTIC SOFTWARE

The following diagnostic software programs ***shall*** be provided as applicable to the manufacturer's tendered apparatus and systems:

16.1.1 Diagnostic software for the engine system(s).

16.1.2 Diagnostic software for the transmission.

16.1.3 Diagnostic software for the ABS braking system.

16.1.4 Diagnostic software for the multiplex wiring system.

16.1.5 Diagnostic software for the roll stability system as applicable.

16.2 DIAGNOSTIC EQUIPMENT

To support the interface of the diagnostic software with the apparatus on board computer systems the following ***shall*** be supplied:

16.2.1 A NEXIQ Pro-Link iQ top complete with carrying case, interconnecting cables, battery, an operating system (installed) that is compatible with the diagnostic software, and associated accessories required to function with the diagnostic test equipment ***shall***$^{(E)}$ be supplied with each vehicle.

17. SPECIAL TOOLING

Prior to delivery of the apparatus, the manufacturer ***shall*** provide to the Technical Authority a listing of specialized tooling (if applicable) that are required to service the fire package and apparatus systems.

18 QUALITY ASSURANCE PROVISIONS

In the performance of the work outlined within the specification, the manufacturer ***shall*** comply with the requirements of the current edition of ISO 9001, Quality Management Systems. It is not the intent to require the manufacturer to hold formal registration/certification; however the manufacturer's quality management system ***shall*** address each requirement of the standard. The following applies:

18.1 QUALITY PLAN

18.1.1 The Contractor ***shall*** submit a Quality Plan with their bid submission, prepared according to the latest issue of ISO 10005 Quality Management Systems - Guidelines.

18.1.2 The Quality Plan may reference other documents. Where referenced documents do not already exist, but are required by the Quality Plan, the plan ***shall*** identify them and also identify when, how and by whom they will be prepared and approved. The documents referenced in the Quality Plan ***shall*** be made available when requested by PWGSC.

18.1.3 When requested by PWGSC, the Contractor ***shall*** submit referenced documents within three working (3) days.

18.2 QUALITY MANAGEMENT SYSTEMS

18.2.1 The manufacturer ***shall*** provide a copy of their Quality Management System with the bid submission.

18.2.2 The manufacturer ***shall*** provide the DND Quality Assurance Representative (QAR) with the accommodation and facilities required for the proper accomplishment of Government Quality Assurance (GQA) and ***shall*** provide any assistance required by the QAR for evaluation, verification, validation, documentation or release of product.

18.2.3 The Quality System for the work described herein ***shall*** be in compliance with the standard as detailed in the Contract. The contractor ***shall*** be responsible for the Quality System. The QAR will assure that the contractor is providing a Quality System.

19 ISO 9001 CERTIFICATION

Manufacturers that provide evidence of current ISO 9001 certification with their bid submission ***shall*** be deemed as having met the requirements for Quality Assurance Provisions as detailed within Specification Item 18.

20 PERFORMANCE AND VERIFICATION TESTING

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Unless otherwise indicated the vehicle ***shall*** be examined and performance tested by the contractor, under real or equivalent load and operating conditions, to ensure item by item conformance to specified requirements. The Technical Authority or representative reserve the rights to witness this testing and may operate the unit sufficiently to assess the fire fighting package performance is in line with Specification detail and requirements.