



REQUEST FOR QUOTATIONS

Title: Supply and Delivery of One Only 100 ft. Mid-Mount Tower Fire Apparatus

Reference No.: 1220-040-2024-032

FOR THE SUPPLY OF GOODS

(General Services)
Issue Date: April 22, 2024

TABLE OF CONTENTS

1. INTRODUCTION4

2. INTERPRETATION.....4

3. ELIGIBLE PARTIES.....4

4. ADDRESS FOR DELIVERY4

5. DATE5

6. INQUIRIES5

7. ADDENDA5

8. FORM OF QUOTATION6

9. QUOTATION PRICE.....6

10. SIGNATURE.....7

11. CONTRACTOR’S REPRESENTATIONS.....7

12. EQUIVALENTS, SUBSTITUTIONS, ALTERNATIVES8

13. OPTIONAL WORK.....8

14. EVALUATION COMMITTEE9

15. EVALUATION CRITERIA.....9

16. EVALUATION PROCESS.....9

17. RESERVATION OF RIGHTS10

18. SELECTION AND NEGOTIATION.....11

19. NO AGREEMENT11

20. LIMITATION OF CITY LIABILITY.....12

21. CONTRACTOR’S EXPENSES12

22. CONFLICTS OF INTEREST12

23. SOLICITATION OF COUNCIL MEMBERS, CITY STAFF AND CITY
CONSULTANTS.....12

24. CONFIDENTIALITY12

ATTACHMENT 1 – DRAFT QUOTATION AGREEMENT – GOODS..... 13

SCHEDULE A – SPECIFICATIONS OF GOODS..... 41

 Part I – GENERAL REQUIREMENTS.....42

 Part II – TECHNICAL AND FUNCTIONAL SPECIFICATIONS / REQUIREMENTS..55

SCHEDULE B – FORM OF QUOTATION.....145
**SCHEDULE B-1 – TECHNICAL AND FUNCTIONAL SPECIFICATIONS / REQUIREMENTS
RESPONSE MATRIX.....149**
SCHEDULE B-2 – ADDITIONAL WARRANTY RESPONSE MATRIX.....154

REQUEST FOR QUOTATIONS

1. INTRODUCTION

The City of Surrey (the “**City**”) invites Quotations for the supply and delivery of **One Only 100 ft. Mid-Mount Tower Fire Apparatus** as described in Schedule A – Specifications of Goods to Attachment 1 – Agreement – Goods (the “**Goods**”), including the performance of the warranty obligations as described in the Agreement which include warranty repair for defects, latent defects and non-compliances, and “fleet defects”.

This request for quotations (the “**RFQ**”) is for a contract for the supply and delivery of **one only 100 ft. mid-mount tower fire apparatus** for the purpose of fire fighting in an urban environment and providing emergency and rescue response services. Details of the City’s functional and technical requirements to which this RFQ relates to are set out in Schedule A – Specifications of Goods (Part I & II) to Attachment 1 – Agreement – Goods.

This RFQ applies to and governs the preparation of Quotations in response to the RFQ.

2. INTERPRETATION

In this RFQ:

- (a) words importing the singular include the plural, and vice versa;
- (b) the word “including” is deemed to be followed by “without limitation”;
- (c) capitalized terms used but not defined in this RFQ, but are defined in other documents referred to in this RFQ, have the meanings assigned to such terms in such applicable documents unless the context requires otherwise; and
- (d) notwithstanding any other provision in the other documents referred to in this RFQ, no term or condition will be implied into this RFQ based on any practice or custom, including any practice or custom in the emergency vehicle supply, assembly or delivery industries, or in any procedures or guidelines recommended for use with respect to such industries.

3. ELIGIBLE PARTIES

Quotations (each a “**Quotation**”) in response to this RFQ will only be considered from authorized manufacturers or dealers of the Goods (each, a “**Contractor**”).

4. ADDRESS FOR DELIVERY

The Contractor should submit the Quotation **electronically** in a single pdf file to the City by email at: purchasing@surrey.ca

Confirmation of receipt of email will be issued. Quotations that cannot be opened or viewed may be rejected. A Contractor bears all risk that the City’s receiving equipment functions properly so that the City receives the Quotation.

Note: The maximum file size the City can receive is 10Mb. If sending large email attachments, Contractors should phone [604-590-7274] to confirm receipt. A Contractor bears all risk that the City's equipment functions properly so that the City receives the Quotation in accordance with the RFQ.

5. DATE

The City would prefer to receive Quotations on or before **June 4, 2024** (the "Date").

6. INQUIRIES

All inquiries related to this RFQ should be directed in writing to the person named below (the "**City Representative**"). Information obtained from any person or source other than the City Representative may not be relied upon.

Name: Sunny Kaila, Manager, Procurement Services
E-mail: purchasing@surrey.ca
Reference: 1220-040-2024-032

Inquiries should be made no later than 7 business days before the Date set out in Section 5. The City reserves the right not to respond to inquiries made within 7 business days of the Date set out in Section 5. Inquiries and responses will be recorded and may be distributed to all Contractors at the discretion of the City.

Contractors finding discrepancies or omissions in the Agreement or RFQ, or having doubts as to the meaning or intent of any provision, should immediately notify the City Representative. If the City determines that an amendment is required to this RFQ, the City Representative will issue an addendum in accordance with Section 7. No oral conversation will affect or modify the terms of this RFQ or may be relied upon by any Contractor.

7. ADDENDA

If the City determines that an amendment is required to this RFQ, the City Representative will issue a written addendum by posting it on the BC Bid Website at www.bcbid.gov.bc.ca (the "**BC Bid Website**") and the City Website at www.surrey.ca (the "**City Website**") (collectively, the "**Websites**"), and upon posting, any addenda will form part of this RFQ. It is the responsibility of Contractors to check the Websites for addenda. The only way this RFQ may be added to, or amended in any way, is by a formal written addendum. No other communication, whether written or oral, from any person will affect or modify the terms of this RFQ or may be relied upon by any Contractor. By delivery of a Quotation, the Contractor is deemed to have received, accepted and understood the entire RFQ, including any and all addenda.

8. FORM OF QUOTATION

Interested parties are required to submit the following information which will be used in the evaluation of Quotations of Contractors.

- (a) To facilitate the evaluation of Quotations, a Quotation should be submitted in the form attached to this RFQ as Schedule B – Quotation, including with respect to section numbering. All parts, pages, figures, and tables set out in a Quotation should be numbered and labeled clearly.
- (b) A Contractor should include in its Quotation a full response to each question or request for information set out in the RFQ, having regard to the form set out in Schedule B – Quotation;
- (c) A Contractor should include in its Quotation a full response for each of the following forms:
 - Schedule B-1 – Technical and Functional Specifications / Requirements Matrix Response Form; and
 - Schedule B-2 – Warranties Matrix Response Form.

In addition to the information included under Schedule B – including Schedules B-1 and B-2 the Contractor should provide the following information:

- (d) Health Safety and Environment Policy(ies) – should submit a copy of your firm’s Health, Safety and Environment Policy;
- (e) Quality Assurance and Quality Control – should submit a copy of your firm’s Quality Assurance and Quality Control procedures and details; and
- (f) The description of the Goods as described in Schedule A – Specifications of Goods to Attachment 1 – Agreement – Goods sets out the preferred minimum requirements of the City. Without limiting the generality of the foregoing, a Contractor should prepare a Quotation that meets the preferred minimum requirements, and may as it may choose, in addition, also include goods, or terms that exceed the minimum requirements.

9. QUOTATION PRICE

The prices set out in the Contractor’s Quotation will, applied in accordance with the terms as set out in Attachment 1 – Draft Quotation Agreement – Goods, represent the entire cost to the City for the complete performance of the supply and delivery of the Goods, exclusive only of applicable sales taxes. The aggregate of such prices (collectively, the “**Quotation Price**”) will be the Contractor’s total price for the complete performance of the supply and delivery of the Goods. The Quotation Price will be deemed to include:

- (a) all costs for labour, equipment and materials included in or required for the completion of the supply and delivery of the Goods, including all items which, while not specifically listed, are included in the supply and delivery of the Goods

specifically or by necessary inference from the terms as set out in Attachment 1 – Draft Quotation Agreement - Goods;

- (b) all overhead costs, including head office and on-site overhead costs, and all amounts for the Contractor's profit; and
- (c) all costs required for compliance with all laws applicable to the performance of the supply and delivery of the Goods and the performance of the warranty obligations as described in Attachment 1 – Draft Quotation Agreement – Goods.

Without limiting the generality of the foregoing, the Quotation Price will be deemed to include all parts for body and chassis which are necessary in order to provide a complete unit, ready for operation, which conforms in strength, quality of workmanship, and materials to that which is usually provided by the trade in general.

10. SIGNATURE

The legal name of the person or firm submitting the Quotation should be inserted in the Quotation. The Quotation should be signed by a person authorized to sign on behalf of the Contractor and include the following:

- (a) If the Contractor is a corporation then the full name of the corporation should be included, together with the names of authorized signatories. The Quotation should be executed by all of the authorized signatories or by one or more of them provided that a copy of the corporate resolution authorizing those persons to execute the Quotation on behalf of the corporation is submitted;
- (b) If the Contractor is a partnership or joint venture then the name of the partnership or joint venture and the name of each partner or joint venturer should be included, and each partner or joint venturer should sign personally (or, if one or more person(s) have signing authority for the partnership or joint venture, the partnership or joint venture should provide evidence to the satisfaction of the City that the person(s) signing have signing authority for the partnership or joint venture). If a partner or joint venturer is a corporation then such corporation should sign as indicated in subsection (a) above; or
- (c) If the Contractor is an individual, including a sole proprietorship, the name of the individual should be included.

11. CONTRACTOR'S REPRESENTATIONS

By submitting a Quotation, a Contractor represents that it has the expertise, qualifications, resources, and relevant experience to supply and deliver the Goods and to perform the warranty obligations as described in the Attachment 1 – Draft Quotation Agreement – Goods.

Any entity submitting a Quotation represents, warrants and guarantees that it is either an authorized dealer of the manufacturer proposed and that the manufacturer has agreed to supply the entity with the Goods in fulfillment of the obligations of the Contractor as set

out in Attachment 1 – Draft Quotation Agreement – Goods, or that it is itself a manufacturer of the Goods.

12. EQUIVALENTS, SUBSTITUTIONS, ALTERNATIVES

Unless otherwise expressly stated, if and wherever the specifications set out in Schedule A - Specifications of Goods to Attachment 1 – Draft Quotation Agreement – Goods, use a brand name of a manufacturer, make, trade name, or catalogue designation in specifying an item, it does not restrict Contractors to the identified manufacturer, make, trade name, or catalogue designation. The usage of such identification is simply to indicate the character, quality and/or performance equivalence of the commodity identified.

Prior to the Date, a Contractor may request, pursuant to Section 6 the City to approve a commodity(ies) (each, an “**Equivalency**”) to be included in a Quotation in substitution for a commodity(ies), indicated in Schedule A Specifications of Goods to Attachment 1 – Draft Quotation Agreement – Goods, on the basis that the substitution of the same or better character, quality and/or performance as the commodity(ies) indicated in Schedule A – Specifications of Goods to Attachment 1 – Draft Quotation Agreement - Goods, such that that the proposed Equivalency will serve the purpose for which it is intended to be used equally as well. Applications for an Equivalency should be in writing delivered to the City Representative, accompanied by appropriate supporting information, data, specifications and documentation. The City may request any additional supporting information, data, specifications and documentation it considers necessary to make a decision with respect to the application. If the City decides in its sole discretion to accept an Equivalency, then the City will provide written confirmation of such acceptance to the Contractor, without notification to other Contractors (subject to the City’s discretion under Section 6). The City is not obligated to review or accept any application for an Equivalency. Without limiting the City’s discretion as set out in this Section 12, the City may specifically refuse to approve an application for an Equivalency with which there may be an associated increase to a Quotation Price or a delay to the supply and delivery of the Goods.

The Contractor should clearly identify in its Quotation any Equivalencies approved by the City under this Section 12.

If the Contractor does not in its Quotation indicate any Equivalencies, the Contractor will be deemed to accept the commodity(ies) described in Schedule A – Specifications of Goods to Attachment 1 – Draft Quotation Agreement - Goods.

13. OPTIONAL WORK

A Contractor should include prices for Optional Work, if any, as called for in Schedule B – Quotation. Such Optional Work prices will be deemed not to include any general overhead costs, or other costs, or profit, that are not directly related to the Optional Work, and the Optional Work prices will only apply if the City elects to proceed with the Optional Work.

Notwithstanding that the City may elect not to proceed with the Optional Work, the prices for any Optional Work, including the extended totals for any Optional Work unit prices, will be included in the Quotation Price for the purpose of any price comparisons between Quotations.

14. EVALUATION COMMITTEE

The evaluation of Quotations to identify a preferred Contractor (the “**Preferred Contractor**”) will be carried out by a committee of one or more persons appointed by the City (the “**Evaluation Committee**”). The Evaluation Committee may be assisted by other persons as the Evaluation Committee may determine it requires, including technical, financial, legal and other advisors or employees of the City.

15. EVALUATION CRITERIA

The Evaluation Committee will compare and evaluate the Quotations to identify the Quotation which the Evaluation Committee judges to be the most advantageous to the City by applying the following evaluation criteria:

- (a) Technical – Design and Performance;
- (b) Qualifications (resources, management, engineering, etc.);
- (c) Quotation Price;
- (d) Delivery; and
- (e) Past Performance in supply and delivering goods similar to the Goods.

It is anticipated that the Quotation that is evaluated to have the highest ranking will be selected as the Preferred Contractor, but the City reserves the right for the Evaluation Committee to decline to recommend any Contractor which the Evaluation Committee, acting reasonably and fairly, determines would, if selected, result in greater overall cost or material risk to the City as compared to another Contractor, considering any relevant factors, including a Contractor’s financial resources, safety record, claims and litigation history, work history and environmental record.

16. EVALUATION PROCESS

To assist in evaluation of Quotations, the Evaluation Committee may, in its sole and absolute discretion, but is not required to:

- (a) conduct reference checks and background investigations of the Contractor, and any subcontractors proposed in the Quotation, with internal and/or external sources, and consider and rely on any relevant information received from the references and from any background investigations in the evaluation of Quotations;
- (b) seek clarification or additional information from any, some, or all Contractors with respect to their Quotations, and consider and rely on such supplementary information in the evaluation of Quotations;

- (c) request interviews/presentations with any, some, or all Quotations to clarify any questions or considerations based on the information included in Quotations, and consider and rely on any supplementary information received from interviews/presentations in the evaluation of Quotations; and
- (d) seek confirmation that the inclusion of any personal information about an individual in a Quotation has been consented to by that individual.

The Evaluation Committee is not obligated to complete a detailed evaluation of all Quotations and may, after completing a preliminary review of all Quotations, identify and drop from any detailed evaluation any Contractor which, when compared to the other Contractors, the Evaluation Committee judges, in its sole discretion, to not be in contention to be selected as the Preferred Contractor. The City expressly reserves the right to reject any design optimizations proposed by a Contractor, or any substitutions proposed by a Contractor that have not been approved by the City pursuant to Section 12.

17. RESERVATION OF RIGHTS

Notwithstanding any other provision in this RFQ:

- (a) The City need not necessarily consider the Quotation with the lowest Quotation Price, or any Quotation, and the City reserves the right to reject any and all Quotations at any time, or cancel the RFQ process, without further explanation, and to accept any Quotation the City considers to be in any way advantageous to it.
- (b) The City's acceptance of any Quotation is contingent on having sufficient funding for the purchase and achieving a mutually acceptable contract for the supply and delivery of the Goods.
- (c) Each Contractor, by submitting a Quotation, irrevocably:
 - (i) agrees that it will not bring any claim, demand, action, cause of action, suit or proceeding, whether arising in contract, tort (including negligence) or otherwise (a "Claim") against the City or any of its employees, directors, officers, advisors or representatives, or any one of them, for any costs, damages or other compensation in excess of an amount equivalent to the actual and reasonable costs directly and demonstrably incurred by the Contractor in preparing its Quotation for any matter relating directly or indirectly to this RFQ (including in the event that the City rejects or disqualifies or for any other reason fails to accept a Quotation, accepts a non-compliant Quotation or otherwise breaches, or fundamentally breaches, the terms of this RFQ or any duties arising from this RFQ); and
 - (ii) waives any Claim against the City and its employees, directors, officers, advisors or representatives for any compensation of whatsoever nature or kind, including for loss of anticipated profits, loss of opportunity, indirect, incidental or consequential damages or losses if no contract between the Contractor and the City is entered into for the supply and delivery of the Goods for any reason whatsoever, including in the event that the City rejects

or disqualifies or for any other reason fails to accept a Quotation, accepts a non-compliant Quotation or otherwise breaches, or fundamentally breaches, the terms of this RFQ or any duties arising from this RFQ; and

- (d) If the City considers that all Quotations are priced too high, it may reject them all.

18. SELECTION AND NEGOTIATION

The Evaluation Committee will recommend to the City the Quotation that it determines is most advantageous in accordance with this RFQ. The City may accept or reject the Evaluation Committee's recommendation.

The City may negotiate changes to any terms of a Quotation, including terms in Attachment 1 – Draft Quotation Agreement – Goods and Schedules A, B, B-1 and B-2 and including prices.

If the City selects a Preferred Contractor, then such Preferred Contractor will use good faith commercial efforts to negotiate and enter into a contract with the City. During negotiations the City may:

- (a) negotiate any aspect of a Preferred Contractor's Quotation, including reductions in the prices as set out in the Preferred Contractor's Quotation;
- (b) negotiate the incorporation of the Preferred Contractor's suggested amendments to the Agreement as may be included in its Quotation; and
- (c) negotiate terms and conditions different than those contained in the RFQ and other documents referred to in the RFQ, the Quotation or both, and
- (d) if at any time the City reasonably forms the opinion that a mutually acceptable contract is not likely to be reached within a reasonable time, give the Preferred Contractor written notice to terminate discussions, in which event the City may then either open discussions with another Contractor or terminate this RFQ in whole or in part and obtain the supply and delivery of the Goods in some other manner, or not at all.

The City has no duty or obligation to advise any other Contractors or to allow them to modify their Quotations, and the City will have no liability to any Contractor as a result of such negotiations or modifications.

The City may, at its sole discretion, require the Preferred Contractor to attend and participate in a pre-award meeting prior to award, the purpose of which will be to confirm project details and expectations of the City.

19. NO AGREEMENT

This RFQ is simply an invitation for Quotations (including prices and terms) for the convenience of all parties. It is not a tender or a request for proposals and no obligations of any kind will arise from this RFQ or the submission of Quotations.

20. LIMITATION OF CITY LIABILITY

Notwithstanding anything to the contrary contained in the RFQ or any other document, material or communication made available to Contractors by the City or its representatives in connection with this RFQ, the City accepts no responsibility or liability for the accuracy or completeness of this RFQ (including any schedules or appendices to it) or any recorded or oral information communicated or made available for inspection by the City (including through the City Representative or any other individual) and no representation or warranty, either express or implied, is made or given by the City with respect to the reliability, accuracy, completeness or relevance of any of those things. The sole risk, responsibility and liability connected with reliance by any Contractor or any other person on this RFQ or any such information as is described in this paragraph is solely that of each Contractor.

21. CONTRACTOR'S EXPENSES

Contractors are solely responsible for their own expenses in preparing and submitting Quotations, and for any meetings, negotiations or discussions with the City or its representatives and consultants, relating to or arising from this RFQ. The City and its representatives, agents, consultants and advisors will not be liable to any Contractor for any claims, whether for costs, expenses, losses or damages, or loss of anticipated profits, or for any matter whatsoever, incurred by the Contractor in preparing and submitting a Quotation, or participating in negotiations for a contract, or other activity related to or arising out of this RFQ.

22. CONFLICTS OF INTEREST

A Contractor should disclose in its Quotation any actual or potential conflicts of interest and existing business relationships it may have with the City, its elected or appointed officials or employees. The City may rely on such disclosure.

23. SOLICITATION OF COUNCIL MEMBERS, CITY STAFF AND CITY CONSULTANTS

Contractors and their agents will not contact any member of the City Council, City staff or City consultants with respect to this RFQ, other than the City Representative at any time prior to the award of a contract or the cancellation of this RFQ and which could be viewed as one Contractor attempting to seek an unfair advantage over other Contractors.

24. CONFIDENTIALITY

All Quotations become the property of the City and will not be returned to the Contractor. All Quotations will be held in confidence by the City unless otherwise required by law. Contractors should be aware the City is a "public body" defined by and subject to the *Freedom of Information and Protection of Privacy Act* of British Columbia.

Attachment No. 1 – DRAFT QUOTATION AGREEMENT – GOODS

RFQ Title: SUPPLY AND DELIVERY OF ONE ONLY 100 FT. MID-MOUNT TOWER FIRE APPARATUS

RFQ No.: 1220-040-2024-032

BETWEEN:

CITY OF SURREY
13450 - 104 Avenue
Surrey, B.C., V3T 1V8
(the “**City**”)

AND:

(the “**Contractor**”)

WHEREAS the City wishes to engage the Contractor to provide the Goods and the Contractor agrees to provide the Goods.

SUPPLY AND DELIVERY OF ONE ONLY 100 FT. MID-MOUNT TOWER FIRE APPARATUS

THEREFORE in consideration of the payment of one (\$1.00) dollar and other good and valuable consideration paid by each of the parties to the other (the receipt and sufficiency of which is hereby acknowledged) the City and the Contractor agree as follows:

DEFINITIONS AND INTERPRETATION

1. In this Agreement, unless the context otherwise requires:
 - (a) “Agreement” means this agreement and all schedules attached hereto;
 - (b) “City” means the City of Surrey;
 - (c) “Change Order” has the meaning set out in Section 55;
 - (d) “Completion Date” means the applicable date set out in Section 6;
 - (e) “Contractor” means the entity described above as the “Contractor”;
 - (f) “Delivery Date” means the delivery date(s) for the applicable Goods, as set out in Section 6;
 - (g) “Delivery Point” has the meaning as set out in Section 19;
 - (h) “Department Representative” means the Surrey Fire Chief or designate as the City’s designated representative;
 - (i) “Fleet Defect” has the meaning set out in Section 78;
 - (j) “Good Industry Practice” has the meaning set out in Section 23(c)

- (k) “Goods” means the equipment or materials (if any) as described generally in Schedule A – Specifications of Goods, including anything and everything required to be done for the fulfilment and completion of this Agreement;
- (l) “Indemnitees” has the meaning set out in Section 94;
- (m) “Optional Work” means the work which may be described in Schedule B – Quotation Extracts as such;
- (n) “Production Schedule” has the meaning set out in Section 26(b); and
- (o) “Purchase Price” has the meaning set out in Sections 44.

2. In this Agreement:

- (a) headings are for convenience and reference only and will not affect the interpretation of the Agreement;
- (b) all dollar figures will mean Canadian dollars;
- (c) unless otherwise expressly stated, any notice or communication required or permitted to be given under the Agreement will be in writing;
- (d) words importing the singular include the plural, and vice versa;
- (e) words importing gender include all genders;
- (f) where a reference is made to a “day”, “week”, “month” or “year”, the reference is to the calendar period;
- (g) where the date for any delivery or response falls on a Saturday, Sunday or statutory holiday observed in British Columbia, the date for such delivery or response will be extended to the next following day which is not a Saturday, Sunday or statutory holiday observed in British Columbia;
- (h) in the calculation of time, the first day will be excluded and the last day will be included;
- (i) the words in this Agreement will bear their natural or defined meaning;
- (j) the word “including” is deemed to be followed by “without limitation”;
- (k) any reference to a statute will include such statute and its corresponding regulations, together with all amendments made to such statute and regulations and in force from time to time, and any statute or regulation that may be passed which has the effect of amending, supplementing or superseding the statute referred to or such statute’s corresponding regulations; and
- (l) the parties confirm that they each have obtained independent legal advice, or elected not to obtain such advice, and accordingly agree that any rule of construction to the effect that any ambiguity is to be resolved against the drafting party will not be applicable in the interpretation of this Agreement.

3. This Agreement consists of all of the documents listed below and may be modified only by express and specific written agreement. In the event of a conflict between the provisions of any documents listed below, then the documents shall govern and take precedence in the following order:

- (a) this Agreement;
- (b) Schedule B – Quotations Extracts;
- (c) Schedule B-1 – Technical and Functional Response Matrix
- (d) Schedule B-2 – Additional Warranties Response Matrix
- (e) Schedule A – Specifications of Goods; and
- (f) other terms, if any, that are agreed to by the parties in writing.

4. The following attached Schedules are a part of this Agreement:

- (a) Schedule A – Specifications of Goods;
- (b) Schedule B – Quotation Extracts;
- (c) Schedule B-1 – Technical and Functional Response Matrix; and
- (d) Schedule B-2 – Additional Warranties Response Matrix.

SUPPLY AND DELIVERY OF GOODS

5. The Contractor will supply and deliver the Goods that meet the specifications set out in Schedule A – Specifications of Goods of this Agreement.

Refer to Schedule B-1 – Technical and Functional Specifications – Requirements Response Matrix for additional information.

The Technical and Functional Specifications – Requirements Response Matrix, attached as Schedule B-1 to this Agreement, forms a part of and is incorporated into this Agreement.

6. The Contractor will complete and deliver to the Delivery Point the Goods in accordance with the following schedule, unless this Agreement has been terminated sooner in accordance with its provisions.

	<u>Completion Date</u>	<u>Delivery Date</u>
Fire Apparatus	_____	_____

7. Notwithstanding anything contrary in Sections 5 through 9 (inclusive) the Contractor shall not ship any one of the Goods prior to the City’s pre-delivery inspection of such Goods as described in Section 39(c).

8. Timely delivery is of the essence and the Contractor will be responsible to ensure that such delivery is made, and will notify the Department Representative immediately in writing of any anticipated delays and the reasons therefor.

9. Goods will not be deemed or construed to be delivered until actually received by the City at the Delivery Point.

PREPARATION OF DESIGN AND SPECIFICATIONS

10. The Contractor will perform and be responsible for the complete design of the Goods.
11. The design of the Goods shall embody the latest approved automotive design practices as offered to commercial trade and shall be furnished complete with all factory-installed standard equipment and accessories listed in the manufacturer's latest literature for the respective unit and any additional equipment as may be defined in the specifications as set out in Schedule A – Specifications of Goods. Notwithstanding the generality of the foregoing, the design of the Goods will ensure the functionality of the Goods, having particular regard for:
 - (a) accessibility of the various components of the Goods which require periodic maintenance operations; and
 - (b) ease of operation, including both pumping and driving operations, and symmetrical proportioning of each of the Goods.

DESIGN PROCESS

12. The design process is progressive as follows:

13. **Preliminary Design:**

Time for Preliminary Design: Within 15 days of the execution of the Agreement, the Contractor shall prepare and submit to the Department Representative a preliminary design for the Goods.

Contents of the Preliminary Design: The preliminary design drawings should illustrate basic components of the Goods including the following:

- (a) show five (5) views, as follows:
 - (i) top view (entire truck);
 - (ii) front end view;
 - (iii) rear end view;
 - (iv) left side view;
 - (v) right side view;
- (b) show the overall dimensions and configuration of the Goods and the arrangement of compartments and equipment storage;
- (c) comply with the technical and functional specification and requirements set out in Part II - Technical and Functional Specifications and Requirements of Schedule A – Specifications of Goods;
- (d) clearly indicate, to scale, all exterior portions of the Goods, including controls, lights, railings, gauges, etc.; and
- (e) any other documents or things required to illustrate, describe or depict the preliminary design and the conformity of same with the requirements of Part II

Technical and Functional Specifications & Requirements of Schedule A – Specifications of Goods.

14. **Detailed Design Meeting**

- (a) **Time For Preparation:** Not later than 15 days after the City has authorized the Contractor to commence with the detailed design the Contractor shall prepare and submit to the Department Representative a complete detailed design;
- (b) **Detailed Design Review:** The Contractor shall participate in a design review and a pre-production meeting with the Department Representative. The design review should cover all design documents. The Department Representative shall review and accept, where appropriate, the design documents, or any portion thereof; and
- (c) **Design Documents:** Design documents means all the design documents provided by Contractor and accepted by the City pursuant to the Agreement including, without limitation, those for use in constructing the Goods, performing the work, and the rendering of the Goods fully operational, and shall include, without limitation, detailed plans, drawings, specifications, manuals, and related materials prepared by or on behalf of Contractor. The design documents shall describe with specificity all elements, details, components, materials, and other information necessary for the complete construction of the Goods and the rendering of the Goods fully operational for its intended purposes, which Goods, if produced in accordance with such design documents, shall satisfy all testing, permitting, qualifications, certifications, validations, and obtaining regulatory approvals by all applicable regulatory authorities required to render the Goods and all their respective components operational and functionally and legally useable for their intended purposes.

15. **Shop Drawings**

The following apply with respect to shop drawings:

- (a) the Contractor shall prepare or cause to be prepared all required shop drawings shall submit of them or cause them to be submitted to the Department Representative for review;
- (b) unless specifically required by the Agreement, the shop drawings will be sufficient to permit the Department Representative to proceed with such review and also to permit the Contractor to proceed with the manufacture of the Goods, and that the shop drawings show details such as fabrication methods, connections or other details;
- (c) shop drawings shall show five (5) views, as follows:
 - (i) top view (entire truck);
 - (ii) front end view;
 - (iii) rear end view;
 - (iv) left side view; and
 - (v) right side view;

- (d) shop drawings shall show the wheelbase and overall dimensions of the Goods, final compartment sizes and other selected features, and changes, if any, mutually agreed to during the pre-production meeting;
- (e) the City may require that a shop drawing be stamped by a registered Professional Engineer with appropriate skill and knowledge indicating that the shop drawing has been prepared in compliance with applicable codes and design standards and Good Industry Practice;
- (f) if the City requires the review and stamping by a Professional Engineer of shop drawings that are of a type which, according to Good Industry Practice, are not so reviewed and stamped, then the cost of such review and stamping shall be paid for by the City;
- (g) the Contractor shall submit shop drawings to the Department Representative in a timely way and in an orderly sequence so as to permit the Department Representative a reasonable opportunity to review the shop drawings without causing a delay to the design, manufacturing or assembly of the Goods. The Department Representative and the Contractor shall cooperate to establish a schedule for the submission and review of shop drawings. The Contractor and the Department Representative shall agree on the number of copies of each shop drawing to be submitted;
- (h) prior to submission to the Department Representative, the Contractor shall review all shop drawings, and shall indicate such review by dating and stamping them. By this review the Contractor represents that the Contractor has determined and verified all field measurements, field construction criteria, materials, catalogue numbers and similar data and that the Contractor has checked and coordinated each shop drawing with the requirements of the Agreement;
- (i) at the time of submission the Contractor shall specifically draw the attention of the Department Representative in writing to any deviations in the shop drawings from the requirements of the Agreement;
- (j) unless otherwise specified in other provisions of the Agreement the shop drawings may be drawn by hand, in CAD format, or other format at the selection of the Contractor;
- (k) the Department Representative will review the shop drawings submitted by the Contractor and return them in accordance with an agreed-to-schedule, if any, or otherwise with reasonable promptness so as not to cause delay to the design, manufacturing or assembly of the Goods;
- (l) the Contractor shall make any changes in shop drawings which the Department Representative may require consistent with the Agreement and resubmit unless otherwise directed by the Department Representative. When resubmitting, the Contractor shall notify the Department Representative in writing of any revisions other than those requested by the Department Representative;
- (m) when a submitted shop drawing is acceptable to the Department Representative, the Department Representative shall date and mark the shop drawing as

“Reviewed” and return it to the Contractor. The Department Representative shall date and mark the number of copies submitted;

- (n) the Contractor may proceed with the design, manufacturing or assembly of the Goods as shown on any shop drawing which the Department Representative has marked “Reviewed”. In no event shall the Contractor proceed with the performance of the design, manufacturing or assembly of the Goods utilizing shop drawings which have not been marked “Reviewed” by the Department Representative;
- (o) the Contractor is responsible for any errors or omissions in the shop drawings and the Department Representative’s review shall not relieve the Contractor of that responsibility. The Department Representative’s review of the shop drawings will be to see if they are in general conformance with the Agreement. The Department Representative may, as the Department Representative may decide, review a shop drawing in greater or lesser detail;
- (p) the Department Representative’s authority to review the shop drawing shall be for the benefit of the City and such authority shall not give rise to any duty or responsibility on the Department Representative or the City to the Contractor, subcontractors, or their agents, employees or other persons performing any of the design, manufacturing or assembly of the Goods; and
- (q) the Department Representative’s review shall not relieve the Contractor of responsibility for errors or omissions in the shop drawings or responsibility for meeting all requirements of the Agreement unless a deviation on the shop drawings has been approved in writing by the Department Representative.

MANUFACTURING AND ASSEMBLY

- 16. The Contractor will have complete control of all manufacturing and assembly required with respect to the Goods, and will effectively direct and supervise such manufacturing and assembly so that it conforms with this Agreement, and the Contractor will be solely responsible for the means, methods, techniques, sequences and procedures and for coordinating the various parts of the manufacturing and assembly of the Goods. Without limiting the foregoing, the Contractor’s means, methods, techniques, sequences and procedures shall be such as to allow ready removal of any component for service or repair.
- 17. The Contractor’s workmanship shall be of the highest quality and shall be completed in a professional manner.
- 18. The Contractor shall manufacture the Goods to be heavy-duty and shall provide ample safety factors to carry loads as specified in Schedule A – Specifications of Goods.

DELIVERY POINT

- 19. The Contractor will take steps as required so that all the Goods are properly prepared for delivery and the Goods shall be driven to Surrey Fire Hall #9, Mechanical Division, 14901 - 64th Avenue, Surrey, B.C., Canada between the hours of 8:00 a.m. to 3:30 p.m., Monday through Friday (the “**Delivery Point**”) under their own power to ensure proper break-in of all components. The City will not assume any liability for Goods or equipment delivered

to an unauthorized location. The Contractor shall ensure the integrity of the Goods during transportation, handling and temporary storage. Due regard shall be given by the Contractor to protection from loss and pilferage, physical damage, and the effect of the elements and environmental conditions. Any loss, damage or repair cost resulting from delivery to the Delivery Point will be the Contractor's sole responsibility.

MARKETABLE TITLE

- 20 The Contractor warrants that it has or will at the time of the transfer of title as described in Section 21 have good and marketable title to the Goods, free and clear of all liens, restrictions, reservations, encumbrances or claims of any kind and that it will defend the City's title to the Goods. In the event of the Contractor's failure to meet this condition, the Contractor will, on written notice from the City, forthwith return all monies paid by the City on account of the Goods and in addition the City may by written notice terminate this Agreement without liability, and in such event, in addition to the above, the Contractor will be liable for any and all expenses or losses incurred by the City resulting from such failure.

TRANSFER OF TITLE

21. Title and all other property rights in and to all tangible personal property, and in and to all parts of tangible personal property that are or are intended to be part of the Goods or are otherwise provided to the Delivery Point by or on behalf of the Contractor under this Agreement, including all consumables, products, materials, equipment, tools, supplies and other items, but not the risk of loss with respect to such tangible personal property, the risk of which will remain with the Contractor until such time as specified in Section 22, will pass to the City free and clear of all encumbrances at the time the Goods are delivered to the Delivery Point.

RISK OF LOSS

22. Risk of loss with respect to the Goods will remain with the Contractor and will not transfer to the City unless and until the City accepts and takes possession and control of the Goods. No loss, injury or destruction of the Goods shall release Contractor from any obligations under this Agreement.

STANDARD OF PERFORMANCE

23. The Contractor will supply and deliver the Goods and perform other services as described in this Agreement in accordance with:
- (a) this Agreement;
 - (b) all applicable laws; and
 - (c) the standards, practices, methods and procedures to the best professional and commercial standard in the industry with respect to the design, manufacture, assembly and delivery of emergency vehicles similar to the Goods, conforming to all applicable laws and exercising that degree of skill, care, diligence, prudence and foresight which would reasonably and ordinarily be expected from a qualified, skilled and experienced person engaged in a similar type of undertaking under the same or similar circumstances ("**Good Industry Practice**").

24. If more than one standard, including governmental requirements, work practices and procedures, and specifications, applies to the supply and delivery of the Goods or the performance of other services as described in this Agreement, then the strictest of such will apply.

PRE-PRODUCTION MEETING

25. Within thirty (30) days of the date of this Agreement at a time and location designated by the City, the Contractor will hold a project pre-production meeting. During this meeting, the Contractor will present the project team, and discuss any special provisions, the Contractor's draft project approach and demonstrate an understanding of the Agreement. The Contractor will accept questions and feedback from the City and adjust the project approach and progress schedule accordingly. At this meeting the Contractor will present the Contractor's draft Production Schedule, the warranty plan, quality assurance plan, preliminary test plan outline, and monthly progress report format. In addition, the Contractor will ensure that its authorized representatives for the pre-production meeting will include the Contractor's applicable sales and engineering personnel. The meeting will be held at a designated City facility between the hours of 8:00 a.m. and 5:00 p.m. (local time) at a date and time agreed to by the parties. At the City's discretion, video conferencing platforms may be utilized for the Pre-Production meeting.

PRODUCTION SCHEDULE

26. The Contractor shall:
- (a) commence the design, manufacturing and assembly of the Goods promptly following the date of this Agreement;
 - (b) within ten (10) days after the pre-production meeting described in Section 25, prepare and submit to the City a horizontal bar chart final build schedule (the "**Production Schedule**"), including a critical path method satisfactory to the Department Representative, acting reasonably, indicating the timing (start and completion date of activities noting the first work day of each week) of all major activities of the design, manufacturing and assembly of the Goods, providing a separate bar for each trade or operation including, mechanical, plumbing and electrical work, and providing details of the critical events and their inter-relationship to demonstrate the work will be performed in conformance with the Agreement; and
 - (c) update the Production Schedule to the satisfaction of Department Representative, acting reasonably, on no less than a monthly basis so as to incorporate any time adjustments as permitted under this Agreement or as otherwise agreed to in writing by the City;
 - (d) pursue the design, manufacturing and assembly of the Goods diligently to ensure that each of the milestone events for the completion of each component of the design, manufacturing and assembly of the Goods as identified in the then current Production Schedule is achieved at or before the time specified in that Production Schedule; and
 - (e) if for any reason the design, manufacturing and assembly of the Goods falls behind the schedule as set out in the then current Production Schedule and if, in

accordance with this Agreement, the delay does not entitle the Contractor to an extension of time, then the Contractor will, as part of the supply and delivery of the Goods take all such steps as are required to bring the design, manufacturing and assembly of the Goods back into conformity with the then current Production Schedule.

Failure to comply with this Section 26 will be deemed to be a default under this Agreement to which Section 59 applies.

27. If in the reasonable opinion of the City, the actual progress of the design, manufacturing and assembly of the Goods does not conform with the then current Production Schedule, then the Contractor shall at its sole expense:
- (a) within ten (10) working days:
 - (i) submit to the City a report satisfactory to the Department Representative, acting reasonably, identifying the reasons for such nonconformity with the then current Production Schedule and outlining the Contractor's plan to address such nonconformity;
 - (ii) submit to the City for review a revised Production Schedule, which shall:
 - (A) be in accordance with Good Industry Practice; and
 - (B) satisfy the requirements of the Agreement.
 - (b) immediately upon acceptance by the City of such plan and revised Production Schedule, diligently pursue the plan so as to bring the design, manufacturing and assembly of the Goods into conformity with the revised Production Schedule.

SUBCONTRACTORS

28. The City reserves the right to approve all subcontractors of the Contractor at any time.

SAFETY

29. If this Agreement includes any inspection, installation or other work on the City's premises by the Contractor, or representative or subcontractor of the Contractor, all such activity shall be performed and undertaken in strict compliance with all applicable health and safety laws and regulations, including, without limitation, the *Workers Compensation Act*, the Occupational Health & Safety Regulation and the *Hazardous Products Act*, and also in strict compliance with any published and issued by the City for use at the City's premises. The Contractor shall provide the City with the Contractor's Workers Compensation Board registration number and a letter from the Workers Compensation Board confirming the supplier is registered in good standing with the Workers Compensation Board and that all assessments have been paid to the date thereof prior to the City having any obligation to pay monies under this Agreement.

WHMIS/MSDS

30. The Contractor covenants and agrees to comply with all the Workers Compensation Board Occupational Health and Safety Regulations for hazardous materials and substances, and in particular with the "Workplace Hazardous Materials Information Systems (WHMIS)" Regulations. All "Material Safety Data Sheets (MSDS)" will be shipped along with the Goods and any future MSDS updates will be forwarded.

TEST AND INSPECTIONS

31. The Contractor shall as part of the supply and delivery of the Goods perform, or cause to be performed all tests, inspections and approvals for the Goods (whether required by this Agreement, or by the Department Representative's instructions, or by applicable laws), and if a test, inspection or approval requires a representative sample of materials or workmanship the Contractor shall at the Contractor's own cost supply the labour and materials necessary to provide the sample.
32. If any portion of the work is designated for special tests, inspections of approvals (either as a requirement in this Agreement, or by the Department Representative's instructions, or by the laws or regulations applicable to the Goods), then:
 - (a) if the Department Representative is to perform or arrange for the test, inspection or approval, the Department Representative shall give the Contractor timely notice requesting such test, inspection or approval; and
 - (b) if other authorities are to perform the test, inspection or approval, the Contractor shall arrange for such test, inspection or approval and shall give the Department Representative timely notice of the date and time for such test, inspection or approval.
33. The Contractor will comply with any order or directions given by the Department Representative for inspection or testing that was not called for in the Agreement, and the following will apply:
 - (a) if such inspection or testing is required to be carried out in advance of the design, manufacturing or assembly of the Goods, then such inspection or testing will be a change to which Sections 53 through 56 apply;
 - (b) if such inspection or testing is required to be carried out on any design, manufacturing or assembly of the Goods that has been completed then:
 - (i) if the inspection or testing determines that the design, manufacturing or assembly of the Goods is not in accordance with this Agreement, then the Contractor shall correct such design, manufacturing or assembly and pay all costs of the inspection or testing and all costs of the correction and the restoration; and
 - (ii) if the inspection or testing determines that the design, manufacturing or assembly of the Goods is in accordance with this Agreement, then the City shall pay all costs of the inspection or testing and all costs of the restoration.
34. If the Contractor disagrees with the results of any inspection or testing required in this Agreement or ordered by the Department Representative, then the Contractor may elect to carry out such further inspection or testing that the Department Representative agrees is acceptable for the purpose of determining whether the design, manufacturing or assembly of the Goods complies with this Agreement. If such further inspection or testing determines the design, manufacturing or assembly of the Goods is not in accordance with this Agreement, then the Contractor shall correct such the design, manufacturing or assembly of the Goods and pay all costs of the initial inspection or testing, all costs of the

further inspection or testing, and all costs of the correction. If such further inspection or testing determines that the design, manufacturing or assembly of the Goods is in accordance with this Agreement, then the City shall pay all costs of the further inspection and testing.

35. If the Contractor covers or permits to be covered any part of the Goods that has been designated for special tests, inspections or approvals, before such special tests, inspections or approvals are made, given or completed, then the Department Representative may direct the Contractor to uncover such part, in order that the inspections or tests may be satisfactorily completed, and make good such part at the Contractor's own expense, and the Contractor shall comply with such direction.
36. The Department Representative will be entitled to observe all tests, inspections and approvals for the Goods, including factory or other tests performed at the Contractor's facility or at the facility of any subcontractor or supplier of the Contractor, and the Contractor will give written notice to the Department Representative of such tests, inspections and approvals for the Goods.
37. The Contractor shall promptly provide the Department Representative with two (2) copies of all certificates, inspection and testing reports required by the Agreement or ordered by the Department Representative.
38. The Contractor shall provide to the City written notice of delivery of the Goods not less than five (5) days prior to expected date of delivery of the Goods to the Delivery Point, to permit final inspection scheduling. An authorized representative of the Contractor shall supervise delivery to the City.

FACTORY INSPECTIONS

Note: The City may decide between in-person inspections, photos inspection, or the City may choose a combination of both options at the City's sole discretion. Contractors should provide pricing for onsite inspections, photos inspections and combination of onsite and photo inspection options. Detailed photos should include all aspects of the build review. For Inspection #3, Contractors should also include in their pricing an independent inspection company to inspect the Goods prior to delivery to the City.

39. The Contractor will in respect to each of the Goods, provide, arrange and pay for three (3) factory inspection trips to the Goods manufacturer's facility for two (2) representatives nominated by the City. Factory inspection trips shall be of a minimum three (3) day duration; include commercial transportation (i.e. airfare), meals, accommodation, and local transportation to and from the manufacturer's facility and shall be conducted during normal business hours Monday through Friday. The factory inspections shall occur at the following stages of production of the Goods:
 - (a) **Inspection #1:** inspection of cab, chassis and main fire pump;
 - (b) **Inspection #2:** inspection of pump installation, all plumbing, and structural body installed, and, primed and ready for paint; and
 - (c) **Inspection #3:** (pre-delivery) Goods shall be in a finished condition and ready for shipment when the pre-delivery inspection is scheduled. A road performance test,

pump test, foam delivery test and general operation demonstration should be performed during the pre-delivery inspection. Certificates of third party testing of the pump should also be available for inspection. Includes photographs and detailed inspection documents and an inspection completed at the Contractor's plant by an independent party or via onsite inspection at the City's discretion. The Contractor shall provide the City timely and adequate prior written notice to enable the City to perform such inspections.

Notwithstanding the first sentence of the first paragraph of this Section 39, the Contractor may, with the City's prior written approval, arrange for more than one of the Goods to be inspected on any one factory inspection trip.

Without limiting the foregoing, the City reserves the right to, at its own cost, conduct additional factory inspections at any time, to monitor the manufacturing and assembly of the Goods. If the City exercises its right to conduct additional factory inspections, the City will, no less than fourteen (14) days before the scheduled date of each such visit, provide to the Contractor advance notice of such visit.

The Contractor shall not implement any modifications to the design, manufacturing or assembly of the Goods requested or discussed by either party at or further to any factory inspections unless a Change Order is issued with respect to such modifications.

REJECTION OF GOODS

40. Upon delivery of the Goods to the Delivery Point, the City shall have a reasonable time to inspect and to accept the Goods.
41. Notwithstanding the transfer of title pursuant to Section 21 or the transfer of risk of loss pursuant to Section 22, the City may reject Goods, or any component of the Goods, not in accordance with this Agreement, whether due to damage resulting from improper packing, loading, unloading or otherwise. The City shall notify the Contractor of rejection of the Goods, or component of the Goods, as the case may be, whereupon the Goods will be held subject to the disposition by the Contractor. Any rejected Goods, or component of the Goods, as the case may be, if the City has taken possession and control of the Goods or such component, will be held by the City at the sole risk of the Contractor and the Contractor will promptly remove or cause to be removed the rejected Goods, or component of the Goods, as the case may be. The Contractor will be responsible for all costs of the removal and disposition of any rejected Goods, or component of the Goods, as the case may be. Any costs or expenses incurred by the City on account of any rejected Goods, or component of the Goods, as the case may be, will, upon written demand by the City, be immediately due and payable by the Contractor, and the City may set-off such costs and expenses against any payment owing by the City to the Contractor.
42. Promptly after receiving a notice of rejection, the Contractor will deliver to the Department Representative a plan in writing describing the steps the Contractor will take and implement to ensure that the Goods, or component of the Goods, as the case may be, that are in accordance with this Agreement, and describing any impacts on the Production Schedule. Such steps shall include any re-testing reasonably required to establish that the Goods, or component of the Goods, as the case may be, comply with the Agreement.

43. If in the opinion of the Department Representative it is not expedient to correct the rejected Goods, or component of the Goods, as the case may be, in accordance with the Agreement, then the Department Representative may direct that such Goods, or component of the Goods, as the case may be, remain with the City and the City may deduct from the monies otherwise due to the Contractor the difference in value to the City, considering the City's intended use of the Goods, or component of the Goods, as the case may be, between the work as performed and that required by the Agreement. The amount of such deduction will be determined in the first instance by the Department Representative. If such amount as determined by the Department Representative is not acceptable to the Contractor, then the parties shall make reasonable efforts to resolve the dispute by amicable negotiations and shall provide frank, candid and timely disclosure of all relevant facts, information and documents to facilitate negotiations.

PURCHASE PRICE

44. As payment for the performance of the Contractor's obligations under this Agreement, the City will pay to the Contractor, the sum of the prices set out in Schedule B – Form of Quotation (the "**Purchase Price**"), inclusive of GST and PST. Payment by the City of the Purchase Price will be full payment for the Goods and the Contractor will not be entitled to receive any additional payment from the City.
45. The Purchase Price will be the entire compensation owing to the Contractor for the complete performance of the Contractor's obligations under this Agreement and this compensation will cover and include all profit and all costs of supervision, labour, material, equipment, transportation and delivery, overhead, financing and all other costs and expenses whatsoever incurred by the Contractor in performing the supply and delivery of the Goods.
46. For greater certainty, costs of general management, non-technical supporting services, all insurance, import duties and taxes, brokerage, royalties, handling, general overhead, profit and all other charges are included in the Purchase Price.
47. The Purchase Price will be in Canadian funds, F.O.B. Destination, Freight Prepaid to the Delivery Point.
48. The Contractor shall be responsible for customs clearance and payment of any duties and/or taxes owing at the time of importation into Canada, as applicable.

PAYMENT

49. Subject to any contrary provisions set out in this Agreement:
- (a) upon delivery of each of the Goods, the Contractor will submit an invoice (the "Invoice") to the City requesting payment relating to each Good delivered. Each Invoice will be in hard copy and include the following information:
- (1) an invoice number;
 - (2) the Contractor's name, address and telephone number;
 - (3) City's Purchase Order Number(s) for the Goods, P.O.# (to be advised);
 - (4) model and serial number(s) of the Goods;

- (5) receipt of a completed Province of British Columbia motor vehicle registration form APV-9T;
 - (6) applicable taxes payable, as separate line items;
 - (7) grand total of the Invoice;
- (b) if the City reasonably determines that any portion of an Invoice is not payable then the City will so advise the Contractor;
- (c) the City will pay the portion of an Invoice which the City determines is payable less any deductions for setoffs or holdbacks permitted by this Agreement including, without limitation, any amounts permitted to be held back on account of deficiencies, within 30 days of the receipt of the Invoice;
- (d) if the Contractor offers the City a cash discount for early payment, then the City may, at the City's sole discretion, pay the portion of an Invoice which the City determines is payable at any time after receipt of the Invoice; and
- (e) all Invoices hereunder shall be stated in, and all payments hereunder shall be made in, Canadian dollars.
50. The payment by the City of any Invoice will not bind the City with respect to any subsequent payment or final payment and will not mean that the City has accepted that the Goods are in accordance with the requirements of this Agreement, or that the Contractor is in any manner released from its obligation to comply with this Agreement.

Please send your hard copy invoices electronically to: surreyinvoices@surrey.ca

DEFICIENCY HOLDBACK

51. The City may hold back from payments otherwise due to the Contractor up to 150% of a reasonable estimate, as determined by the City, on account of deficient or defective materials. This holdback may be held, without interest, until replacement Goods are received or such deficiency or defect is remedied.

RIGHT OR SET-OFF

52. The City may set-off, as against any amounts due to the Contractor, any amount owing from the Contractor to the City, including liquidated damages and other amounts as payable under this Agreement.

CHANGE ORDERS

53. The City may at any time propose changes to the Contractor's scope by altering, adding to or deducting from the Contractor's scope, including by altering, adding to or deducting from the specifications as set out in Schedule A – Specifications of Goods, as the City in its sole discretion considers necessary to accomplish the general purposes of the Agreement, by issuing written notice to the Contractor of the proposed change. The Contractor may request changes to the specifications as set out in Schedule A – Specifications of Goods by submitting to the City written notice of the requested change referencing the specific section(s) and page number(s) of Schedule A – Specifications of Goods that are affected

by the requested change, and supporting documentation acceptable to the City with respect to the requested change.

54. The Contractor shall, within a reasonable time of receiving notice of a proposed change or at the time that it requests a change, present in a form acceptable to the City, a method of adjustment or an amount of adjustment for the Purchase Price (whether a net increase, or net decrease), if any, and the adjustment in the then current Production Schedule, if any, for the proposed change.
55. If the City and the Contractor agree to the adjustments, if any, in the Purchase Price and the then current Production Schedule, or to the method to be used to determine the adjustments, such agreement shall be effective immediately and shall be recorded in a written change order ("**Change Order**"), signed by the City and the Contractor.
56. The Contractor shall furnish the services or deliverables in the Change Order in accordance with the requirements of the Agreement and any written provisions, specifications, or special instructions issued by the City with respect to the Change Order.
57. The Contractor shall not make any changes to the specifications without a Change Order. City may refuse to accept all or a part of the Goods if changes are made by the Contractor without a Change Order. City will not be responsible for costs incurred by the Contractor with respect to unauthorized changes.

OPTIONAL WORK

58. Optional Work may be included in the supply and delivery of the Goods at the sole election of the City. Such Optional Work will only be included in the supply and delivery of the Goods if the Department Representative so directs in writing delivered to the Contractor, and in such event:
 - (a) the Department Representative will issue a Change Order for the Optional Work; and
 - (b) the Contractor will perform the Optional Work as part of the supply and delivery of the Goods.

DEFAULT AND TERMINATION

59. In the event the Contractor does not ship any one of the Goods by the applicable Completion Date as set out in Section 6, or does not deliver any one of the Goods by the applicable Delivery Date as set out in Section 6, or otherwise fails to comply with the requirements of this Agreement, then:
 - (a) City reserves the right to terminate this Agreement, in whole or in part, and in the event of such termination no payment will be owing by the City on account of this Agreement and the Contractor will be liable for any and all expenses or loss resulting from such failure or delay and will return all monies paid by the City; or
 - (b) if the City does not terminate this Agreement for late shipping or delivery, the City may deduct and setoff from any payments owing to the Contractor all additional costs the City reasonably incurs on account of the late shipping or delivery.

60. The City may by written notice at any time cancel this Agreement with respect to Goods which, as of the date of cancellation, have not been shipped.
61. If the Contractor becomes insolvent or makes an assignment for the benefit of creditors or a receiver or trustee is appointed for the property of the Contractor, then the City may, at its election, and without prejudice to its rights at law or in equity, terminate this Agreement.
62. The City will not accept nor be responsible for any restocking charges for any Goods shipped to the City and then, for whatever reason, returned to the Contractor pursuant to this Agreement. The Contractor is to bear all costs including shipping and handling of returned Goods.

DISPUTE RESOLUTION

63. Dispute Resolution Procedures

The parties will make reasonable efforts to resolve any dispute, claim, or controversy arising out of this agreement or related to this agreement (“**Dispute**”) using the dispute resolution procedures set out in this Section.

- (a) Negotiation. The parties will make reasonable efforts to resolve any Dispute by amicable negotiations and will provide frank, candid and timely disclosure of all relevant facts, information and documents to facilitate negotiations.
- (b) Mediation. If all or any portion of a Dispute cannot be resolved by good faith negotiations within 30 days, either party may by notice to the other party refer the matter to mediation. Within 7 days of delivery of the notice, the parties will mutually appoint a mediator. If the parties fail to agree on the appointment of the mediator, then either party may apply to the British Columbia International Commercial Arbitration Centre for appointment of a mediator. The parties will continue to negotiate in good faith to resolve the Dispute with the assistance of the mediator. The place of mediation will be Surrey, British Columbia. Each party will equally bear the costs of the mediator and other out-of-pocket costs, and each party will bear its own costs of participating in the mediation.
- (c) Litigation. If within 90 days of the request for mediation the Dispute is not settled, or if the mediator advises that there is no reasonable possibility of the parties reaching a negotiated resolution, then either party may without further notice commence litigation.

WARRANTY

64. The Contractor warrants that the Goods shall:
 - (a) be new and of recent manufacture, carrying full manufacturers’, distributors’ and installers’ or suppliers’ warranties unless otherwise required or permitted under this Agreement;
 - (b) be of best quality, unless otherwise specified in this Agreement;

- (c) be free from defects in design, materials, workmanship, faults and faulty operation, and free from latent defects;
 - (d) conform in all respects to the terms of this Agreement, all applicable laws, Good Industry Practice, and all applicable manufacturers' recommendations;
 - (e) be fit and suitable and perform satisfactorily for the purposes and under the conditions made known to the Contractor by the City or which were reasonably inferable; and
 - (f) be at least equal to the higher of national standards or codes (such as, by way of illustration, CSA or ASTM), or standards and codes customarily applicable at the place where the City will use the Goods.
65. Notwithstanding any other warranty period as may be specified in this Agreement, and without limiting the Contractor's obligation to supply and deliver the Goods as described in this Agreement, the Contractor will provide a two (2) year warranty for the Goods supplied and delivered under this Agreement, commencing from the date that the Goods are accepted by the City in accordance with this Agreement (if acceptance of particular Goods occur on different dates, the warranty described in this Section 65 shall commence on the date that each of those Goods are accepted by the City in accordance with this Agreement).

ADDITIONAL WARRANTIES

66. Without limiting the generality of Section 65, the Contractor shall provide each of the following additional warranties with respect to each of the Goods, with the following minimum terms, each commencing from the date that the particular Good is accepted by the City in accordance with this Agreement:
- (a) a full lifetime frame warranty, substantially in the form as set out in Schedule B – Quotation Extracts. This warranty shall cover all apparatus manufacturer designed frame, frame members, and cross members against defects in materials or workmanship for the lifetime of the covered Goods. For certainty, a frame warranty that does not cover cross members for the life of the Goods shall not satisfy this Section 66(a);
 - (b) a comprehensive 10-year/100,000-mile structural warranty. This warranty shall cover all structural components of the cab and/or body manufactured by the Goods manufacturer against defects in materials or workmanship for 10 years or 100,000 miles, whichever occurs first. Excluded from this warranty are all hardware, mechanical items, electrical items, or paint finishes;
 - (c) a full 10-year stainless steel plumbing components warranty. This warranty shall cover defects in materials or workmanship of apparatus manufacturer designed foam/water plumbing system stainless steel components for 10 years;
 - (d) a 25-year structural integrity warranty on the aerial device. This warranty shall cover structural components; and

- (e) a 10-year limited paint and corrosion perforation warranty. This warranty shall cover paint peeling, cracking, blistering, and corrosion provided the Good is used in a normal and reasonable manner. This warranty shall be prorated as follows:

Topcoat and appearance: Retention, Cracking	Coating system, adhesion and corrosion: Includes Dissimilar metal corrosion, Flaking, Gloss, Colour Blistering, Bubbling
0 to 36 months 100%	0 to 36 months 100%
37 to 84 months 50%	37 to 84 months 50%
85 to 120 months 25%	85 to 120 months 25%

Corrosion perforations shall be covered 100% for 10 years.

Refer to Schedule B-2 – Additional Warranty Response Matrix for additional information.

The Additional Warranty Response Matrix, attached as Schedule B-2 to this Agreement, forms a part of and is incorporated into this Agreement.

ASSIGNMENT OF WARRANTIES

67. Without limiting the generality of Section 65 or Section 66, the Contractor shall assign to the City any warranty or service guarantee offered by a third party manufacturer, distributor, installer or supplier of the Goods. Nothing in this Section 67 relieves the Contractor from any responsibilities under any of the warranty provisions in this Agreement.

ON-CALL SUPPORT AND ON-SITE SERVICE

68. The Contractor shall, at its own expense, make available a competent engineering service representative(s) available on request to assist the City in the resolution of engineering or design problems that may arise during any applicable warranty period.
69. The Contractor shall be available to provide on-site service support, commencing on the date that the first of the Goods are delivered to the Delivery Point, and ending two (2) years after the last of the Goods are delivered to the Delivery Point.
70. Nothing in Section 68 or Section 69 relieves the Contractor from any responsibilities under any of the warranty provisions in this Agreement.

WARRANTY REPAIR OR REPLACEMENT

71. On written notice from the City under this Section 71 of any defects or latent defects discovered in the Goods within any applicable warranty period, including in any materials or equipment incorporated into the Goods, or other non-compliance with this Agreement covered by any warranty under this Agreement, given to the Contractor promptly following such defect of non-compliance becoming apparent, the Contractor will promptly, upon being given access to the affected Goods by the City, commence to remedy such non-compliance, and any damage to the Goods and any other equipment or property resulting from the non-compliance, and will without delay proceed to complete the repair and remediation so that the affected Goods are in compliance with this Agreement.

72. After completing the repair and remediation of the affected Goods the Contractor may apply to the Department Representative for acceptance of that repair and remediation. The Department Representative will, no later than 14 days after the receipt of such an application, inspect the repaired or remediated Goods and will, no later than a further seven days after the inspection, notify the Contractor in writing of the acceptance, or the reasons for refusal, of the application. If the application is refused, then the Contractor will address the reasons for refusal and may re-apply for acceptance of the repaired or remediated Goods in accordance with this Section 72. If for any reason the Department Representative fails, within 30 days of an application by the Contractor under this Section 72, to accept or give reasons for the refusal of that application, the Department Representative will be deemed to have accepted that application.
73. If the repair or remediation of the affected Goods cannot promptly be commenced and/or completed by the Contractor because of an interruption or unavailability of access because of the occurrence of any emergency circumstances or the operational interests of the City, then the Contractor will use commercially reasonable efforts to recommend a temporary repair acceptable to the City and will carry out such a temporary repair in a timely manner and then complete the final repair promptly when full access is available. If the City for operational reasons delays providing access to the Contractor to complete the final repair, then additional costs of the final repair resulting from such delay will be a change to which Sections 53 through 56 apply.
74. If the Contractor reasonably determines that a temporary repair of the affected Goods is not possible or advisable in the circumstances, it will promptly advise the City, providing reasons and a recommendation as to whether the City can safely continue to use and operate the affected Goods without material risk of incurring additional incremental loss, damage, cost or expense beyond that already suffered as a result of the non-compliance. If the City continues to use the affected Goods notwithstanding the Contractor's recommendation, then the Contractor will be relieved of all further warranty obligations to the extent of any incremental defects arising out of such continued use and operation of the affected Goods.
75. The Contractor will carry out all repair and remediation of the affected Goods, including any temporary repair accepted by the City as described in Section 74, at its own cost and without any right to reimbursement by the City with respect to such costs. The Contractor will be responsible for all costs associated with such repairs and replacements and will indemnify and save harmless the Indemnitees from any resulting damages. Other Goods, components of Goods or property damaged due to the defects, or in repairing such defects, will also be restored by the Contractor in accordance with Sections 71 through 74, without additional payment by the City, to a state at least as good as prior to the removal of or damage to that other Goods or property due to the defects, or prior to the repair to such defects.
76. Subject to Section 96, the Contractor shall be liability for all losses, damages, claims, costs or expenses incurred by the City in connection with any defect, latent defect or non-compliance covered by any warranty under this Agreement. Notwithstanding the foregoing, the Contractor will not be liable for any losses, damages, claims, costs or expenses suffered by the City as a result of the Contractor's inability to promptly commence and/or complete any repair or remediation of the affected Goods because of an unavailability or interruption of access, as provided above, not caused by any act, error

or omission of the Contractor or any of its employees, agents, representatives or subcontractors, or any other person for whom the Contractor is legally responsible.

77. Nothing in Sections 71 through 76 will be interpreted as precluding the City from carrying out repair or remediation of the Goods as permitted under this Agreement.

FLEET DEFECTS

78. If any defect or latent defect discovered in the Goods, including in any materials or equipment incorporated into the Goods, or other non-compliance with this Agreement, that covered by a warranty under Section 65, Section 66 or Section 81 is identified in respect of any of the Goods within the applicable warranty period, and if such defect, latent defect or non-compliance reasonably can be expected in respect of the other Goods (each such defect, latent defect or non-compliance, a “**Fleet Defect**”), then the Contractor will remedy such Fleet Defect in respect of all the Goods to the satisfaction of the Department Representative, and Sections 72 through 76 will apply, whether or not the design, manufacture or assembly of those Goods has been completed, or has not yet begun, and whether or not such Fleet Defect is apparent in such other Goods, and whether or not the applicable warranty period described in Section 65, Section 66 or Section 81 with respect to such other Goods has expired, except to the extent that the Contractor can demonstrate to the satisfaction of the Department Representative acting reasonably that the applicable Fleet Defect does not exist, and will not arise, in connection with the other Goods. Nothing in this Section 78 will be interpreted as precluding the City from carrying out repair or remediation of the Goods as permitted under this Agreement.

FAILURE TO REMEDY DEFECTS

79. If the Contractor fails to remedy any defect or damage within a reasonable time following notice thereof, then a date may be fixed by the Department Representative on or by which the defect or damage is to be remedied. The Contractor will be given reasonable written notice of this date. If the Contractor fails to remedy the defect or damage by such date and the remedial work was to be executed at the cost of the Contractor under Section 71 or Section 78, then the City may, at its option: require the Department Representative to determine a reasonable reduction in the Purchase Price; or
- (a) carry out the repair or remediation using the City’s own forces or others, in a reasonable manner and at the Contractor’s sole cost and risk. The Contractor will pay to the City, within 30 days after receipt of an invoice, the costs reasonably incurred by the City in remedying the defect or damage;
 - (b) require the Department Representative to determine a reasonable reduction in the Purchase Price; or
 - (c) if the defect or damage deprives the City of substantially the whole benefit of the Goods or any one of the Goods, terminate the Contract as a whole, or in respect of those of the Goods which cannot be put to the intended use. Without prejudice to any of its other rights and remedies under this Agreement or otherwise but subject to the provisions of Section 96, the City will then be entitled to recover all sums paid for the Goods or for any one of the Goods (as the case may be), plus financing costs and the cost of dismantling such Goods and returning such Goods to the Contractor.

80. If the City performs any repair or remediation under Section 79, then:
- (a) the City shall perform the repair or remediation using parts specified by the Contractor specifically for such repair;
 - (b) the Contractor will supply and deliver to the City all parts required to warranty repairs by the City at no additional cost to the City. Such parts shall be shipped prepaid to the City from any source selected by the Contractor, without delay. Parts supplied by the Contractor shall be original equipment supplier (OEM) parts;
 - (c) notwithstanding Section 80(b), the City may, at its discretion and on notice to the Contractor, use Contractor-specified parts available from the City's own stock;
 - (d) the Contractor may request that damaged parts covered be returned by the City to the manufacturing plant, in accordance with the Contractor's written instructions and at the Contractor's cost;
 - (e) the Contractor shall, within sixty (60) days of receipt of an invoice from the City, reimburse the City for repairs or remediation carried out by the City as follows:
 - (i) if the City uses any Contractor-specified parts available from the City's own stock, the Contractor shall reimburse the City for the use of such parts at the current market price of such parts, plus applicable taxes and a 15% handling cost;
 - (ii) in respect of the City's labour costs, the amount shall be determined by multiplying the number of man-hours actually required by a City Certified Vehicle Technician to perform the repair or remediation at a straight time per hour shop rate which will include fringe benefits in effect at time the repair or remediation is performed; and
 - (iii) the cost of towing the affected Goods to the City's usual repair facility, if required; and
 - (f) monthly, or at times to be mutually agreed upon, reports of all repairs or remediation carried out by the City shall be submitted by the City to the Contractor, outlining the costs incurred by the City with respect to such repairs and remediation in the month, or such other period, as the case may be. The Contractor shall provide forms for these reports.

WARRANTY FOR REPAIRED OR REPLACED GOODS

81. The warranties set out in Section 65 and Section 66 will apply to all Goods or components of Goods repaired or replaced under Section 71 or Section 78, whether or not such repair is performed by the Contractor, a third party authorized by the Contractor, or by the City as permitted under Section 79, and a new warranty period for such repaired or replaced Goods, or components of Goods, as the case may be, will commence from the date that the repair or replacement of such Goods, or components of Goods is accepted under Section 72, and extend for the warranty time period indicated in Section 65 and Section 66, as applicable.

FAILURE ANALYSIS

82. The Contractor shall, upon written notice from the City, prepare and submit to the City a failure analysis of any component of the Goods which have been removed or replaced pursuant to Section 71, Section 78 or Section 79 that could affect the City's operation of any of the Goods. Such report shall be delivered to the City within sixty (60) days of the Contractor's receipt of such component.

LIQUIDATED DAMAGES FOR UNAVAILABILITY OF GOODS FOR SERVICE

83. Without limiting any other remedy that the City may have under this Agreement or at law, if due to any defect, latent defect or non-compliance that is covered by any warranty under Section 65, Section 66 or Section 81, or if due to a Fleet Defect, or if due to any repairs or remediation required in connection with such defect, latent defect or non-compliance, or Fleet Defect:
- (a) any of the Goods are unavailable for service, then the Contractor shall pay the City as liquidated damages for the unavailability of the Goods for service the sum of minimum Five Hundred (\$500) Dollars for each calendar day that each of the Goods is unavailable for service; and
 - (b) any of the Goods are unavailable for service and the City, in its sole discretion, activates reserve equipment in order to maintain service, then the Contractor shall pay the City as liquidated damages the sum of One Thousand Five Hundred (\$1,500) Dollars for each calendar day that each such reserve equipment is activated.
84. The parties agree that the amounts described in Section 83 are liquidated damages and not a penalty, and reflect a genuine and reasonable pre-estimate of the costs which the City would incur should the specified circumstances arise. The Contractor hereby authorizes the City to deduct liquidated damages from any sums otherwise due to the Contractor under the Agreement. If the monies due to the Contractor are insufficient or no monies are due to the Contractor, the Contractor shall pay the City within thirty (30) calendar days after receipt of written demand by the City. The amounts specified herein are the City's sole remedy for the losses specifically described in Section 83.

PARTS AVAILABILITY GUARANTEE

85. The Contractor hereby guarantees to provide, within reasonable periods of time the spare parts, software and all equipment necessary to maintain and repair the Goods after the date of commissioning of the last of the Goods to be delivered. Parts shall be interchangeable with the original parts installed in the Goods and shall be manufactured in accordance with the quality assurance provisions of this Agreement. Prices shall not exceed the Contractor's then current published catalogue prices.
86. Where the parts ordered by the City are not received within two (2) business days of the Delivery Date and the Goods are out-of-service due to the lack of such parts, then the Contractor shall provide the City immediately upon the City's verbal or written request, the original suppliers' and/or manufacturers' parts numbers, company names, addresses, telephone numbers and contact persons names for all of the specific parts not received by City.

87. Where the Contractor fails to honour this parts guarantee or parts ordered by the City are not received within seven (7) days of the Delivery Date, then the Contractor shall provide to City within seven (7) days of the City's verbal or written request, the design and manufacturing documentation for those parts manufactured by the Contractor and the original suppliers' and or manufacturers' parts numbers, company names, address, telephone numbers and contact persons names for all of the specific parts not received by the City. The Contractor's design and manufacturing documentation provided to the City shall be for the City's sole use in regard to the Goods and for no other purpose.

INTELLECTUAL PROPERTY WARRANTY

88. The Contractor warrants and guarantees that Goods delivered under this Agreement do not infringe any valid patent, copyright or trademark, foreign or domestic, owned or controlled by any other corporation, firm or person.

INSURANCE

Contractor's Insurance Policies

89. The Contractor will, without limiting its obligations or liabilities and at its own expense, provide and maintain throughout this agreement the following insurances in forms and amounts acceptable to the City from insurers licensed to conduct business in Canada:
- (a) commercial general liability insurance on an occurrence basis, in an amount not less than three million (\$3,000,000) dollars inclusive per occurrence against death, bodily injury and property damage arising directly or indirectly out of the work or operations of the Contractor, its employees and agents. The insurance will include cross liability and severability of interests such that the coverage shall apply in the same manner and to the same extent as though a separate policy had been issued to each insured. The insurance will include, but not be limited to: premises and operators liability, broad form products and completed operations, owners and Contractors protective liability, blanket contractual, employees as additional insureds, broad form property damage, non-owned automobile, contingent employers liability, broad form loss of use, personal injury, and incidental medical malpractice. The City will be added as additional insured;
 - (b) professional errors and omissions liability insurance in an amount not less than two million (\$2,000,000) dollars insuring all professionals performing any professional services in respect of the Goods from liability resulting from errors or omissions performing any professional services in respect of the Goods; and
 - (c) automobile liability insurance on all vehicles owned, operated or licensed in the name of the Contractor in an amount not less than three million (\$3,000,000) dollars per occurrence for bodily injury, death and damage to property;
 - (d) All-risk property insurance, including transportation/transit coverage for the full replacement cost of any item. This insurance will cover all equipment including work (products) in progress prior to delivery to the City.

Insurance Requirements

90. The Contractor will provide the City with evidence of the required insurance prior to commencing any work under of this Agreement. Such evidence will be in the form of a completed certificate of insurance acceptable to the City. The Contractor will, on request from the City, provide certified copies of all of the Contractor's insurance policies providing coverage relating to the Goods, including without limitation any professional liability insurance policies. All required insurance will be endorsed to provide the City with thirty (30) days advance written notice of cancellation or material change restricting coverage. To the extent the City has an insurable interest, the all-risk property policy will have the City as first loss payee. The Contractor will be responsible for deductible amounts under the insurance policies. All of the Contractor's insurance policies will be primary and not require the sharing of any loss by the City or any insurer of the City.

Contractor Responsibilities

91. The Contractor acknowledges that any requirements by the City as to the amount of coverage under any policy of insurance will not constitute a representation by the City that the amount required is adequate and the Contractor acknowledges and agrees that the Contractor is solely responsible for obtaining and maintaining policies of insurance in adequate amounts. The insurance policy coverage limits shall not be construed as relieving the Contractor from responsibility for any amounts which may exceed these limits, for which the Contractor may be legally liable.

Additional Insurance

92. The Contractor shall place and maintain, or cause any of its subcontractors, suppliers and consultants to place and maintain, such other insurance or amendments to the foregoing policies as the City may reasonably direct.

Waiver of Subrogation

93. The Contractor hereby waives all rights of recourse against the City for loss or damage to the Contractor's property.

INDEMNITIES

94. The Contractor will indemnify and save harmless the City and all of its elected and appointed officials, officers, employees, servants, representatives and agents (collectively the "**Indemnitees**") from and against all claims, demands, causes of action, suits, losses, damages and costs, liabilities expenses and judgments (including all actual legal costs) for damage to or destruction or loss of property, including loss of use, and injury to or death of any person or persons which any of the Indemnitees incur, suffer or are put to arising out of or in connection with any failure, breach or non-performance by the Contractor of any obligation of this Agreement, or any wrongful or negligent act or omission of the Contractor or any employee or agent of the Contractor.
95. The Contractor will indemnify and save harmless the Indemnitees, from and against any and all claims, demands, causes of action, suits, losses, damages and costs, liabilities, expenses and judgments (including all actual legal costs) by reason of any claim, action or litigation arising out of any alleged or actual infringement of any patent, copyright or trademark,

foreign or domestic, relating to the Goods supplied under this Agreement. Without limiting the foregoing, if any part of the Goods uses any patent, copyright or trademark, foreign or domestic, or anything else which infringes the rights of others or which is alleged to infringe the rights of others, the Contractor shall, at its own cost and expense, immediately:

- (a) procure for the City an irrevocable, perpetual, nonexclusive, fee free, royalty free, non assignable license for the City to use such patent, copyright or trademark, foreign or domestic, or any other rights for the purpose of operating, maintaining and repairing the Goods;
- (b) replace or alter the infringing or allegedly infringing parts with non infringing parts of equal or better quality so as to meet or exceed the requirements of the Agreement; or
- (c) if permitted the City in writing, forthwith refund the amount paid by the City to the Contractor under the Agreement with respect to the infringing or allegedly infringing parts.

CONSEQUENTIAL DAMAGES

96. Neither party is liable to the other party for that other party's own:

- (a) special, contingent, exemplary, punitive, indirect, incidental or consequential loss or damage;
- (b) loss of anticipated revenue, overhead or profit;
- (c) loss of production, business or contracts;
- (d) loss by reason of shutdowns, non-operation or increased costs of construction, manufacturing or operation; or
- (e) loss of business reputation or opportunities, of any nature arising at any time or from any cause whatsoever relating to the Agreement, and whether or not such losses or damages were foreseeable even if a party was advised of the possibility of them.

For certainty, nothing in this Section 96 will apply to, or be interpreted so as to, preclude, or otherwise limit:

- (f) recovery of liquidated damages specified as payable to the City pursuant to this Agreement, if any, and, any right of recovery for the Contractor's delay in the performance of the supply and delivery of the Goods contrary to the provisions of this Agreement, or any breach of this Agreement by the Contractor, including the City's out of pocket costs, any administrative costs, the cost of the City's own forces and resources and the cost of the Department Representative; or
- (g) recovery of any of the types of loss or damage described in subsections (a) through (e) of this Section 96, if such losses or damages would be receivable, recoverable or claimable (or which would have been receivable, recoverable or claimable but for the default or other failure, act or omission on the part of the Contractor, or any

subcontractor of the Contractor, or those for whom such persons may in law be responsible) under any insurance policy obtained and maintained or required to be obtained and maintained under this Agreement, under applicable laws or in accordance with Good Industry Practice.

INTERNATIONAL SALE OF GOODS

97. The parties expressly agree that the United Nations Convention on Contracts for the International Sale of Goods does not and will not apply to this Agreement.

WAIVER

98. Any failure of the City at any time or from time to time to enforce or require the strict keeping or performance of any of the terms and conditions contained in this Agreement shall not constitute a waiver of the terms and conditions and shall not affect or impair the terms or conditions in any way or the City's right at any time to avail itself of any remedies as the City may have for any breach or breaches of the terms and conditions.

APPLICABLE LAW

99. This Agreement shall be governed by and construed in accordance with the laws of the Province of British Columbia. The City and the Contractor accept the jurisdiction of the courts of British Columbia and agree that any action under this Agreement shall be brought in such courts.

NOTICES

100. Any notice, report or other document that either party may be required or may wish to give to the other should be in writing, unless otherwise expressly provided for, and will be deemed to be validly given to and received by the addressee:

- (a) by hand, on delivery;
- (b) by facsimile, on transmission; or
- (c) by mail, five calendar days after posting.

The addresses for delivery will be as follows:

(a) The City:

Attention:

(b) The Contractor:

Attention:

MERGER AND SURVIVAL

101. The representations, agreements, covenants and obligations set out in this Agreement shall survive the delivery of the Goods and payment of the Purchase Price.

ENTIRE AGREEMENT

102. This Agreement, including any other documents expressly included by reference in this Agreement, contains the entire agreement of the parties regarding the provision of the Goods, and no understandings or agreements, oral or otherwise, exist between the parties except as expressly set out in this Agreement. This Agreement supersedes and cancels all previous agreements between the parties relating to the Goods.

103. In the event that the Contractor issues an invoice, packing slip, sales receipt, or any like document to the City, the City accepts the document on the express condition that any terms and conditions in it which constitute terms and conditions which are in addition to or which establish conflicting terms and conditions to those set out in this Agreement are expressly rejected by the City.

SIGNATURE

104. This Agreement may be executed in one or more counterparts all of which when taken together will constitute one and the same Agreement, and one or more of the counterparts may be delivered by fax transmission or as a pdf file.

ENUREMENT

105. This Agreement shall enure to the benefit of and be binding upon the respective successors and permitted assigns of the City and the Contractor.

This Agreement is executed by the City of Surrey this _____ day of _____, 2024.

CITY OF SURREY

by its authorized signatory:

(Signature of Authorized Signatory)

Print Name and Position of Authorized Signatory

This Agreement is executed by the Contractor this _____ day of _____, 2024.

CONTRACTOR

I/We have the authority to bind the Contractor:

(Signature of Authorized Signatory)

Print Name and Position of Authorized Signatory



SCHEDULE A

SPECIFICATIONS OF GOODS

Consists of:

- **PART I – GENERAL REQUIREMENTS**
- **PART II – TECHNICAL AND FUNCTIONAL SPECIFICATIONS & REQUIREMENTS**



PART I – GENERAL REQUIREMENTS

SCHEDULE A – SPECIFICATIONS OF GOODS

RFQ Title: SUPPLY AND DELIVERY OF ONE ONLY 100 FT. MID-MOUNT TOWER FIRE APPARATUS

RFQ No: 1220-040-2024-032

PART 1 - GENERAL REQUIREMENTS

GENERAL

1. The Contractor shall furnish all necessary labour, materials, supplies, and transportation necessary to manufacture and deliver one only 100 ft. mid-mount tower fire apparatus and any spare parts in accordance with this Agreement (the “**Goods**”).
2. Part II - The Technical and Functional Specifications and Requirements of Schedule A define technical and functional specifications and requirements for the Goods. These technical and functional specifications and requirements are based on a general performance type specification pursuant to which the Contractor shall be responsible for designing, fabricating, assembling, testing and finishing the Goods, in compliance with the requirements of the RFQ. Included within these specifications and requirements may be specified components, equipment and systems, usually accompanied by the phrase “or approved equal.” Such components, equipment and systems, or deviations and substitute items specifically approved by the City, shall be provided as part of the completed Goods under the RFQ. The City’s specification of such components, equipment and systems or the approval of such items, however, shall not relieve the Contractor of any obligations under the Agreement since the City expects and is relying on the Contractor, in designing and testing the Goods, to verify suitability and safety of materials, components, equipment, systems and items before incorporating them into the design, fabrication or assembly of the Goods provided by the Contractor.

All parts for body and chassis which are necessary in order to provide a complete unit, ready for operation, shall be included and shall conform in strength, quality of workmanship, and materials to that which is usually provided by the trade in general. Any variance from these specifications and functional and technical requirements or standards in quality should be clearly pointed out in writing by the Contractor in their response. The specifications and functional and technical requirements for the Goods as specified in Schedule A, describe the minimum specifications and functional and technical requirements the City requires the Goods to meet. The Goods shall meet or exceed the minimum specifications, and functional and technical requirements. The Contractor will coordinate progress of the work, progress schedules, and submittals. The unit(s) proposed shall be new, manufacturer’s latest make and model in current production as offered to commercial trade and shall be furnished complete with all factory-installed standard equipment and accessories listed in the Contractor’s latest literature for the respective unit and any additional equipment as may be defined in the technical specifications. Throughout these specifications and functional and technical requirements, compatibility is of the essence and any modification, accessory, device, material or type of construction, whether to existing or to the specified equipment, which may be necessary to incorporate the specified equipment into the existing equipment shall

be considered to be a part of these specifications whether detailed by item or not. Workmanship shall be the best quality, executed by workers experienced and skilled in the respective duties.

REFERENCES

3. All references to codes, standards and general and technical specifications & requirements referred to in these specifications or used on drawings shall mean and intend to be the currently adopted edition, amendment and revision of such reference standards in effect at the time of Agreement execution. Referenced standards and code requirements shall be considered minimum requirements. Applicable portions of standards used that are not in conflict with the Agreement documents are hereby made a part of the specifications. Modifications or exceptions to standards shall be considered as amendments, and unmodified portions shall remain in full effect. In cases of discrepancies between the specifications and standards, the requirements of the specifications shall govern. Where references to codes or standards are used in these specifications, the Contractor should familiarize himself with the applicable portions and shall be governed by them. If requested, the Contractor shall furnish an affidavit from manufacturers certifying that materials or products delivered meet the requirements specified. However, such certifications shall not relieve the Contractor from the responsibility of complying with any added requirements specified in the agreement documents.

GENERAL MANUFACTURING AND DESIGN

4. The complete Good, assemblies, subassemblies, component parts, etc., shall be designed and constructed with the due consideration to the nature and distribution of the load to be sustained and to the general character of the service to which the Goods is subjected when placed in service. All parts of the Goods shall be designed with a factor of safety, which is equal to or greater than that which is considered standard and acceptable for this class of equipment in firefighting service. All parts of the Goods shall be strong enough to withstand general service under full load. The Goods shall be so designed that the various parts are readily accessible for lubrication, inspection, adjustment and repair.
5. The Good and all major components shall be manufactured in North America.
6. The Good shall conform to the current NFPA Standard for Fire Apparatus, the Canadian Federal Government Motor Vehicle Safety Act and Regulations; Canadian Motor Vehicle Safety Standards [CMVSS]; and Province of British Columbia Motor Vehicle Act and Regulations relating to commercial vehicles as well as to vehicles used for firefighting, and emergency vehicles at time of Agreement signing.
7. The Good shall have a certified Province of British Columbia G.V.W.R. weight sticker applied to the apparatus on delivery to ensure the apparatus meets all laws pertaining to the weight carrying capacity of the Goods.
8. The Good offered by the Contractor should conform to the requirements of the following authorities and publications, as applicable, as a minimum but not limited to:
 - (a) CAN/ULC S515, latest edition, Automobile Fire Fighting Apparatus (each unit is to be tested and plated by Underwriters Laboratories of Canada (ULC);

- (b) NFPA #1901, latest edition, Standard for Automotive Fire Apparatus; and
 - (c) CWB/CSA, (Canadian Welding Bureau / Canadian Standards Association), various standards for welding and inspecting aluminum, stainless steel and steel.
9. All oil, hydraulic and air tubing lines and electrical wiring shall be located in protective positions properly attached to the frame or body structure and shall have protective loom or grommets at each point where they pass through structural members, except where a through-frame connector is necessary.
 10. Parts and components should be located or positioned for rapid and simple inspection and recognition of excessive wear or potential failure. Whenever functional layout of operating components determines that physical or visual interface between items cannot be avoided, the item predicted to require the most maintenance shall be located for best accessibility.
 11. Cover plates, which must be removed for component adjustment or part removal, should be equipped with quick-disconnect fastenings or hinged panels.
 12. Drains, filler plugs, grease fittings, hydraulic lines, bleeders and check points for all components should be located so that they are readily accessible and do not require special tools for proper servicing. Design practices shall minimize the number of tools required for maintenance.
 13. Materials shall conform to the specifications listed herein. When not specifically listed, materials shall be of the best quality for purpose of commercial practice. Materials shall be free of all defects and imperfections that might affect the serviceability of finished product.
 14. All nameplates and instruction plates shall be metal with the information engraved, stamped, or etched thereon, as required by NFPA #1901.
 15. Name plates shall show make, model, serial numbers, or other such data necessary to positively identify the item and all fluid types and levels for vehicle. All plates shall be mounted in a conspicuous place with stainless steel screws and bolts, as required by NFPA #1901.
 16. The manufacturing process, including quality control, shall be consistent with present industry standards. All equipment, materials and articles required under this specification are to be new or fabricated from new materials produced from recovered materials. The term "Heavy Duty", as used to describe an item, shall mean in excess of the standard, quantity, quality, or capacity and represents the best, most durable, strongest, etc., part, component, system, etc., that is currently available. The City shall be the sole judge of quality, construction and stability of the Goods and equipment being offered.
 17. Defective components shall not be furnished. Parts, equipment and assemblies, which have been repaired or modified to overcome deficiencies, shall not be furnished without the approval of the City. Welded, bolted, and riveted construction utilized shall be in accordance with the highest standards of the industry. CWB/AWB Certified welders should perform all welding. Component parts and units shall be manufactured to definite

standard dimensions with proper fit, clearances, and uniformity. General appearance of the vehicle shall not show any evidence of poor quality of work.

18. Any variance from these specifications and requirements or standards in quality should be clearly pointed out in writing by the Contractor in their technical specifications and requirements. The Good shall further conform to all D.O.T. and British Columbia Motor Vehicle Act regulations. No exception.
19. Each Contractor shall furnish satisfactory evidence of their ability to design, engineer, and construct the Goods specified and shall state the location of the factory producing the Goods. They shall also substantiate they are in a position to render prompt and proper service and to furnish replacement parts for the Goods.
20. Each submission should be accompanied by a set of detailed Contractor's specifications consisting of a detailed description of the Goods and equipment proposed.
21. Throughout these specifications and requirements compatibility is of the essence and any modification, accessory, device, material or type of construction, whether to existing or to the specified equipment, which may be necessary to incorporate the specified equipment into the existing equipment shall be considered to be a part of these specifications whether detailed by item or not.

MATERIAL AND WORKMANSHIP

22. Welding shall not be employed in the assembly of the apparatus in a manner that will prevent the removal of major component parts for service and/or repair. This includes, but is not limited to the following:
 - (a) Individual body compartments;
 - (b) Doors;
 - (c) Panbraces;
 - (d) Body subframe;
 - (e) Bodysides; and,
 - (f) Beavertails, etc.

N.B. ALL WELDING SHOULD BE DONE BY CWB/AWB CERTIFIED WELDERS, NO EXCEPTIONS.

23. The Contractor shall certify that all components of the drive train are compatible and will stand the strain of Fire Department use, and still bear the original manufacturer's standard warranty. It will be the responsibility of the Contractor to check with the original manufacturer of the chassis in this regard and inform the City of any change that may be necessary in the specifications so they will conform to standards.
24. The design of the Good shall be modern, employing the latest automotive engineering practices designed to suit the nature of the services, which the Goods should perform. Frame, springs, radial arms, transmission, differential, axles, shafts and gears shall be strong enough to withstand the road speed and practical tests, and the unusual stresses and strains place on such apparatus in the firefighting service. All of the equipment furnished shall be the original manufacturer's current published data. If specifications

exceed these, or the Contractor sees fit to add extra features, they shall be considered as minimum and be furnished, without additional cost to the City.

25. All areas shall be primed with the highest quality products available before being hidden by body construction, or finished paint.

DELIVERY

26. Pre-Delivery Service: After transportation from the factory and immediately prior to delivery, the Good(s) shall receive a pre-delivery service consisting of engine oil and filter change, chassis lubrication, adjustment of the engine to manufacturer's specifications, and a complete inspection including all electrical and mechanical devices for proper operation and correction of leaks or obvious problems.
27. Upon delivery the Good(s) shall be delivered clean and shall be complete with all equipment operable. The delivered Goods will be inspected for compliance with the City's specifications, NFPA 1901 and previously authorized exceptions.
28. The checklist developed during the preliminary inspection(s) at the Contractor's manufacturing facility should be used to verify that all items previously identified, as deficient/defective/unacceptable were corrected/replaced.
29. Deviations will not be acceptable unless they were noted and accepted by the City as exceptions/substitutions.
30. The Goods and equipment will only be accepted by the City upon successful completion of all required tests and delivery of all specified equipment.
31. Equipment items not delivered at time of tests or construction not in conformance with the requirements will be cause for the City to withhold payment.
32. Post Delivery Tests: The City may conduct acceptance tests of the delivered Good. If the City conducts such tests, the tests shall be completed within 15 (fifteen) days after the applicable Good is delivered and shall be conducted with written test plans. The purpose of these tests is to identify defects that have become apparent between the time the applicable Good were released from the manufacturer to the time of delivery to the Delivery Point. The post-delivery tests shall include visual inspection and testing the total Good operation.
33. In the event the Good fails to meet the requirements of these tests and specifications on first trials, second trials may be performed at the Contractor's option within thirty (30) days of the date of first trials. Such trials are to be witnessed by the City and completed at the expense and risk of the Contractor. Such trials shall be final and conclusive and failure to comply with these requirements shall be cause for rejection. Failure to comply with changes, as the City, may consider necessary and to conform to any clause of these specifications within thirty (30) days after written notice of such changes is given to Contractor shall be cause for rejection of the Good.
34. Acceptance will only occur upon issuance of a formal written acceptance signed by the City.

35. Delivery Engineer: The Contractor shall, at its own expense, have a competent engineering service representative(s) available on request to assist the City's Fire Services mechanical staff in the solution of engineering or design problems within the scope of the specifications that may arise during the warranty period. This does not relieve the Contractor of its warranty obligations under the Agreement.
36. Performance Tests and Requirements: The Contractor shall conduct acceptance performance tests at its or its manufacturer's plant on the Good following completion of manufacture and before delivery to the City. These pre-delivery performance tests shall include visual and measured inspections, as well as testing the total Good operation. The performance tests should be conducted and documented in accordance with written test plans, approved by the City.
37. The Good shall meet the following requirements:
- (a) The Goods shall be tested and approved by Underwriter's Laboratories of Canada in accordance with ULC S515 Standards and/or NFPA 1901.
 - (b) The Contractor will furnish copies of:
 - (i) pump manufacturer's certification of Hydrostatic Test;
 - (ii) the engine manufacturer's current Certified Brake Horsepower curve; and,
 - (iii) a current EPQ for the engine and the manufacturer's record of Goods construction details, when delivered.
38. The Contractor, at his sole expense, shall have the Underwriters Laboratories of Canada conduct the tests required under "Certification of Fire Department Pumper", latest version. A certificate of compliance with these tests shall be forwarded to the City.

DELIVERABLES

39. The Contractor shall provide the City the following documentation upon delivery:
- (a) All keys [two (2) full sets], parts and service manuals are to be delivered with the vehicle;
 - (b) Manufacturer's Certificate of Origin;
 - (c) Two (2) complete hard copy operations manuals for the entire Good, and one (1) digital copy;
 - (d) Mechanical maintenance manual(s) for entire Good;
 - (e) Parts listing for all parts/components incorporated in the manufacturing of the Goods;
 - (f) Engine operation and maintenance manual(s);
 - (g) Transmission operation and maintenance manual(s);
 - (h) Required software licenses (engine diagnostic, ABS diagnostic, SRS diagnostic, Multiplex diagnostic, additional software as required, telemetric possibilities);
 - (i) Two (2) pump operation and maintenance manuals;
 - (j) Drawings:
 - as built specifications specific drawings;
 - as built specification specific wiring diagrams;
 - complete electrical schematic for the Good. Schematic must be specifically prepared for each Goods rather than a generic schematic designed to accommodate the Good;

- schematic of all measurements;
 - alignment certification;
- (k) Warranty document(s) and/or certifications as set out in the Agreement; and
- (l) Any special tools that are required in the care and maintenance or overhaul of the apparatus and its components.

The Contractor shall keep maintenance manuals available for a period of three years after the date of acceptance of the last of the Goods. The Contractor shall also exert its best efforts to keep maintenance manuals, operator manuals, and keep parts books up-to-date for a period of 15 (fifteen) years after the date of acceptance of the last of the Goods. The supplied maintenance and operator's manuals shall incorporate all equipment ordered on the Goods.

ELECTRONIC OPERATOR'S, MAINTENANCE INFORMATION AND PARTS MANUALS (CONTRACTOR SUPPLIED)

41. The Contractor shall keep maintenance manuals, operator manuals and parts books up to date for a period of fifteen (15) years. The supplied maintenance and operators manuals should incorporate all parts, components and equipment ordered on the Goods covered by this RFQ.
42. The Contractor shall supply all software information, including source codes for any programmed module or component. Also to be supplied is any special hardware necessary to repair or modify any microprocessors and/or software used on the Goods. The Contractor shall supply: complete schematic drawings containing component information, and the location of the components on the circuit board; circuit descriptions and theory of operation for all electronic components. The City shall consider all such data as proprietary.
43. A binder shall be supplied that has any City acceptable electronic device used and paper documents as listed below. The binder shall contain two (2) duplicate acceptable electronic devices used. Each electronic device shall have:
- (a) Operations and maintenance instructions for items on the Goods, not including the Contractor's literature;
 - (b) Contractor's literature, as available, for purchased components;
 - (c) Electrical diagrams including charts illustrating the individual wire colour, number coding and function;
 - (d) Parts manuals;
 - (e) Drawings and an overall vehicle layout;
 - (f) Certificates; and
 - (g) Warranties.
44. Printed documents shall include, but not limited to the following:
- (a) Operations and maintenance instructions for items on the Goods, except the engine;
 - (b) Operations and maintenance instructions for the engine;
 - (c) Certificates of independent test results;
 - (d) Warranty documents;
 - (e) Manufacturer's record of construction details and engine power curve; and

- (f) Goods final alignment report.
45. One (1) to two (2) electronic manuals for the main water pump shall be included (if there is a main water pump on the Goods), and as provided by the pump manufacturer. Additional electronic and paper documents, as provided by other equipment suppliers, shall also be included.

TRAINING AND SUPPORT SERVICES

46. At no cost to the City, the Contractor shall provide an educational program for the City's Fire Services department mechanical/maintenance personnel of a quality and depth sufficient to permit satisfactory use and servicing of the Goods. This program shall include formal and informal instruction, mock-ups, models, manuals, diagrams and parts catalogues. The Contractor shall assume no knowledge of the features of the Goods on part of the City's mechanical/maintenance personnel and shall design the program to bring the level of knowledge to one which is fully adequate for this objective. The Contractor may assume that the City's mechanical/maintenance personnel have the basic skills pertinent to being a qualified mechanic.
47. The Contractor shall within 30 days after the date of Agreement execution, submit to the Department Representative for approval an outline of the educational program and a schedule for presentation. The program shall be conducted at the Contractor's facilities and shall include classroom instruction. The Contractor shall provide an adequate supply of high quality, professionally prepared material on paper, as well as other training aids as may be necessary to impart the essential knowledge to the City's mechanical/maintenance personnel involved and leave them with the most up-to-date reference materials. The Department Representative will approve the outline and schedule within 30 days after its receipt or require such changes as the Department Representative may deem desirable.
48. The primary objective of the educational training program shall be to train the City's mechanical/maintenance personnel so that they are proficient in the operation and maintenance of the advanced design of the Goods, to the extent that they may provide the instruction and training of the City's other maintenance personnel not involved in the Contractor's educational training program.
49. All training, as described below, shall take place by the Contractor prior to acceptance of the Good by the City. One City's mechanical personnel shall be available for operation and maintenance training.
50. Operations and maintenance training shall be tailored specifically to the City's purchased Good and designed to teach the day-to-day operation of the Good's components/equipment. The training shall be sufficient to bring the City's mechanical/maintenance personnel to a level of operating proficiency such that routine Contractor support shall not be needed.
51. Contractor shall provide the following training to the City's mechanical/maintenance personnel:
- (a) Goods operators will be trained in the operation of all chassis and body functions, including operator preventive maintenance consisting of written procedures and

schedules for the periodic maintenance of all equipment; technicians will be trained in all operator functions, in-depth troubleshooting for all major chassis and body systems, engine tune-up procedures, transmission maintenance and repair, and chassis and body maintenance and repair.

52. The trainer shall be factory-trained and thoroughly knowledgeable in subjects to be taught, including but not limited to subjects as outlined above.
53. Refresher training will be accomplished annually at not cost to the City. Periodic training on machine systems and components will be provided as requested by the City, at no cost to the City.
54. The educational training program shall be completed by a mutually agreed to time by the Department Representative and the Contractor's training personnel. At the City's discretion, video conferencing platforms may be utilized for the training(s).

PROJECT RECORD DOCUMENTS (PREFERRED FORMAT)

55. **Requirements Included:**

- (a) Record documents, samples, and specifications;
- (b) Equipment systems;
- (c) Product data, materials and finishes, and related information;
- (d) Operation and maintenance data; and,
- (e) Warranties.

56. **Related Requirements:**

- (a) Shop drawings, product data and samples;
- (b) Construction Schedule; and,
- (c) Individual Specifications: Specific requirements for operation and maintenance data.

57. **Quality Assurance:**

Prepare instructions and data by personnel experienced in maintenance and operation of described products.

Format

- (a) Organize data in the form of an instructional manual, index by specification;
- (b) Binders; commercial quality, 215mm x 279mm, maximum size, ring style;
- (c) When multiple binders are used, correlate data into related consistent groupings;
- (d) Cover: Identify each binder with typed or printed title "Project Record Documents", list title of project and identify subject matter of contents;
- (e) Arrange content under section numbers and in same sequence as Table of Contents;
- (f) Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment;
- (g) Tests: Manufacturer's printed data or typewritten data on 20lb. paper; and,
- (h) Submit sample binder and index for review and approval prior to proceeding.

58. **Contents Each Volume:**

Table of Contents: Provide title of project: names, addresses and telephone numbers of Contractor with name or responsible party; schedule of products and systems, indexed to content of the volume.

For Each Product of System: List names, addresses and telephone numbers of subcontractors and Contractors, including local source of supplies and replacement.

Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information.

Drawings: Supplement product data to illustrate relations of component parts of equipment and system, to show control and flow diagrams.

Type Text: As required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating all manufacturers' instructions.

59. **Submission:**

Submit two (2) copies of completed volumes in final form 15 days following final acceptance inspection.

Revise content of documents as identified by the Department Representative.

Submit two (2) copies of revised complete volumes of data in final form as well as one (1) reproducible copy of all as-built, Agreement and shop drawings at application for final payment.

Provide electronic [.pdf] format complete manuals on CD Rom structured per hardcopy and complete with navigational tools. Information contained within electronic manuals shall be maintainable and updatable in Microsoft Excel or Word format, balancing schematic diagrams in AutoCAD [latest version].

60. **Recording "As Built" Conditions:**

Record information on a set of blue or blackline drawings and in a copy of project manual at the commencement of the project.

Record information concurrently with construction progress. Do not conceal work until required information is recorded.

61. **Agreement drawings and shop drawings:** Legibly mark each item to record actual construction, including:

- (a) measured locations of internal utilities and appurtenances, concealed elements of mechanical and electrical services referenced to visible and accessible features of construction and building grid lines;
- (b) field changes of dimension and detail;
- (c) changes made by change orders;
- (d) references to related shop drawings and modifications; and

- (e) refer to mechanical and electrical specifications for additional specific technical requirements.

62. **Specifications**: Legibly mark each item to record actual construction, including:

- (a) manufacture, trade names, and catalogue number of each project actually installed, particularly optional items and substitute items; and,
- (b) changes made by addenda and Change Orders.

63. **Other Documents**: Maintain manufacturer's certifications, inspection certifications and field test records required by individual specifications sections.

64. **Equipment and Systems**: For each item of equipment and each system include description of unit or system, and component parts. Give function, normal operation characteristics and limiting conditions.

Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replacement parts.

Provide electrical service characteristics, controls and communications.

Include installed colour coded wiring diagrams.

65. **Operating Procedures**: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping shutdown and emergency instructions. Include summer, winter and any special operating instructions.

66. **Maintenance Requirements**: Include routine procedures and guide for troubleshooting, disassembly, repair and reassembly instructions; and alignment, adjusting, balancing and checking instructions.

- (a) Provide service and lubrication schedule, and list of lubricants required;
- (b) Include manufacturers' printed operation and maintenance instructions;
- (c) Include sequence of operation by controls manufacturers;
- (d) Provide original manufacturer's parts list, illustrations, assembly drawings and diagrams required for maintenance;
- (e) Provide installed control diagrams by controls manufacturer;
- (f) Provide Contractor's coordination drawings, with installed colour coded piping diagrams;
- (g) Provide charts of valve tag numbers, with location and function of each valve keyed to flow and control diagrams;
- (h) Include test and balance reports; and,
- (i) Additional requirements: As specified in individual specification sections.

67. **Materials and Finishes**:

Applied Materials and Finishes: Include product data, with catalogue number, size, composition, and colour and texture designations. Provide information for re-ordering custom manufactured products.

Instruction for Cleaning Agents and Methods: Precautions against detrimental agents and methods, and recommend schedule for cleaning and maintenance.

Moisture Protection and Weather-Exposed Products: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommend schedule for cleaning and maintenance.

68. **Warranties:** Separate each warranty as described in Sections 64 through 67 with index tab sheets keyed to the Table of Contents listing.

List subcontractors, Contractor and manufacturer, with name, address and telephone number of responsible principal.

Obtain warranties executed in duplicate by Contractors, Contractors and manufacturers within ten (10) days after completion of the applicable item of work.

Except for items put into use with the City's permission, leave data of beginning of time of warranty until the date of final inspection and acceptance is determined.

Verify that documents are in proper form and contain full information.

Co-execute submittals when required.

Retain warranties until time specified for submittal.

Refer to Schedule B-2 – Additional Warranties Response Matrix for additional information.

The Additional Warranties Response Matrix, attached as Schedule B-2 to this Agreement, forms a part of and is incorporated into this Agreement.

- END OF PAGE -



SCHEDULE A

SPECIFICATIONS OF GOODS

PART II – TECHNICAL AND FUNCTIONAL SPECIFICATIONS & REQUIREMENTS

SCHEDULE A – SPECIFICATIONS OF GOODS

PART II - TECHNICAL AND FUNCTIONAL SPECIFICATIONS AND REQUIREMENTS

Index #	Item
I	Vehicle
II	Cab
III	Chassis
IV	Engine and Transmission
V	Generator
VI	Pump
VII	Main Body
VIII	Lighting Systems
IX	Electrical Systems
X	Hydraulics
XI	Aerial Platform
XII	Aerial Waterway
XIII	Paint & Decaling
XIV	Options & Requirements
XV	Measurements

**SCHEDULE A
SPECIFICATIONS OF GOODS**

RFQ Title: SUPPLY AND DELIVERY OF ONE ONLY 100 FT. MID MOUNT TOWER FIRE APPARATUS

RFQ No: 1220-040-2024-032

PART II - TECHNICAL AND FUNCTIONAL SPECIFICATIONS AND REQUIREMENTS

1. General Requirements

1.1 General Configuration Guidelines

The following technical and functional specifications and requirements generally define the requirements of a 100 ft. mid mount tower fire apparatus. The Contractor should provide the information described in this section. Contractors should identify where conflicts may exist between their solution and the preferred specifications and requirements described by the City below:

I - VEHICLE		
Index #	Item	Specification
1.00	Vehicle General	
1.01	Model Year	Latest model year
1.02	Model of Cab & Chassis	Custom Cab and Chassis specifically designed for the Fire Service application.
1.03	Make of Body	Quality Fire Apparatus Body Manufacturer
1.04	OEM	Encompassing manufacturer responsible for the final delivered product. *inclusive of warranties as outlined in Warranty section
1.05	Country of Service	The Goods shall be designed and built for service for the Country of Canada
1.06	Canadian Motor Vehicle Safety Regulations	The Goods shall comply with the current Canadian Motor Vehicle Safety Standards (CMVSS)
1.07	Motor Vehicle act of British Columbia	The Goods shall comply with the current British Columbia Motor Vehicle Act regulations
1.08	ULC	The Goods shall be compliant with ULC S515 standards, latest edition.
1.09	NFPA	The Goods shall be compliant with NFPA 1901 standards, latest edition.
1.10	Apparatus Type	100 foot midmount aerial Platform Apparatus
1.11	Pump configuration	Midship Driveline Pump setup
1.12	Axle configuration	6x4 (single steer axle / tandem drive axle)
1.13	Front Axle GAWR	Approx. 23,000 lb GAWR to be adequate to carry the weight of the completed apparatus including load. *The mass of the apparatus, when fully outfitted and loaded as per this standard, shall be a minimum of 10% less than the GVWR of the chassis. **Air Ride and independent front suspension is not preferred.

1.14	Rear Axle GAWR	Approx. 63,000 lb tandem rear axle assembly. *The mass of the apparatus, when fully outfitted and loaded as per this standard, shall be a minimum of 10% less than the GVWR of the chassis. **Air Ride suspension is not preferred.
1.15	Tandem Inter-Axle Differential Lock	The tandem axle chassis shall include an inter-axle differential lock, which will allow both axles to be engaged as drive axles. A flipper valve actuator and red indicator lamp shall be located below the instrument panel.
1.16	Tandem Axle Suspension	The rear tandem suspension shall be Ridewell Dynalastic model RD-202, incorporating a straddle mount pedestal and urethane pivot bushings, preset load distribution and independent axle movement. Four accordion elastomer springs and four shock absorbers shall be provided to allow dampening of axles on jounce and rebound. The suspension shall have 54" axle centers and have a rated capacity of 63,000 pounds GAWR.
1.17	GVWR	Approx. 75,000 lb *The mass of the apparatus, when fully outfitted and loaded as per this standard, shall be a minimum of 10% less than the GVWR of the chassis. **Air Ride suspension is not preferred.
1.18	Top Speed	The top speed of the vehicle shall be approximately 68 MPH +/-2 MPH at governed engine RPM.
1.19	Undercoating	The apparatus is to undergo an undercoating process. During this application, special care will be taken to avoid spraying the product on air lines, cables, or other items that would cause normal maintenance to be hindered.
1.20	Mud Flaps	Four (4) mud flaps will be installed on the apparatus, two at the front and two at the rear. The mud flaps will be a minimum of 3/8" thick to prevent "sailing".
1.21	Back up Alarm	A backup alarm shall be installed at the rear of the chassis with an auto-adjusting output level of not less than 87 dB and up to 107 db. The alarm will automatically activate when the transmission is placed in reverse. Ensure there is no ability to temporarily disable the Back-up alarm.

II - CAB		
Index #	Item	Specification
1.00	Cab General	
1.01	Build	Cab shall be aluminum bodied with minimal plastic and/or composite panels built for extreme duty service
1.02	Design	The Cab shall be a "Cab over engine" style with four man doors capable of seating five (5) fully equipped Fire Fighters (4 forward facing seats - 1 rear facing seat) and shall be built with safety and ergonomics in mind. The preference is for a flat floor, with 10" raised roof over driver, officer and crew area, approx. 60" cab measurement from centre of front axle rear.
1.03	Occupant Protection System	Cab to come complete with frontal and full side curtain air bag protection system.
1.04	Occupant Protection System diagnostics	Fault-indicating Supplemental Restraint System (SRS) light on the driver's instrument panel. Diagnostic software shall be provided for troubleshooting and repair.
1.05	Cab Undercoating	The underside of the Cab shall be coated to provide abrasion protection, sound insulation, and corrosion protection.
1.06	Engine tunnel	The engine tunnel shall be heavily insulated from heat and noise.

1.07	Cab insulation	Cab ceiling and walls shall be insulated for noise and assist in maintaining climate control settings
1.08	Raised roof	The cab shall have a raised roof section (10" minimum) over the Drivers, officer, and crew area.
1.09	Cab doors	Preference will be for all cab entry doors to be full length in design to fully enclose the lower cab steps. All door hinges shall be hidden within flush mounted cab doors for a pleasing smooth appearance and perfect fit along each side of the cab. Each door hinge shall be piano style and shall be constructed of stainless steel.
1.10	Cab Side door windows	The front and rear doors will have a full roll down manual windows.
1.11	Door handles	The cab entry doors will be equipped with exterior pull handles that are heavy duty in material and construction and suitable for use while wearing firefighter gloves. Interior door handles to be flush mounted in the upper door panel. All cab doors will be keyed alike with power door locks.
1.12	Door Locks	Door lock design shall be as close to as possible to the following configuration. The doors shall include a Controller Area Network (CAN) based electronic door lock system which shall include two (2) external keypads, one (1) located on the left side next to the front grab handle and one (1) on the right side next to the front grab handle. There shall be one (1) red rocker switch provided on the inside of each front cab entry door to actuate the door locks. The rear cab entry doors shall be provided with a red manual knob on the interior paddle handle to actuate the door lock on the respective door. The electronic door lock system shall include four (4) key fobs for actuation with buttons for cab entry door locks and for compartment door locks. When the doors are unlocked using the external keypad or the key fobs the interior dome lights shall illuminate and remain on for a period of twenty (20) seconds
1.13	Door opening	The cab doors opening and design shall be for the ease of entering and egress when fire fighters are outfitted in their kit.
1.14	Door Weather Stripping	The doors shall include a double rolled style automotive rubber seal around the perimeter of each door frame and door edge ensuring a weather tight fit.
1.15	Door Panels	The interior of each door will be accessible by a panel(s) that is easily removable for servicing. Preference for the panel material to be made of aluminum and coated with Zolatone type texture finish or equivalent. The door panels will provide access to the window regulators.
1.16	Steps	Steps will be designed to provide easy and safe access in and out of the cab. The cab will be equipped with a first step mounted under each door, preference for a bolt on. The steps will be contoured to the radius of the cab fender and will protrude from the cab the same distance as the fender. The steps will have exposed safety grates. A second step will be provided below the cab floor level and will be on the interior of the door. Preference for the first step to include bolt on tread.
1.17	Grab Handles	Grab Handles shall be considered to be "Fireman Friendly". There shall be one horizontally mounted grab handle per door for ease of closing the door without interference to the seated occupant. There shall be Grab Handles mounted on the interior of each A post for ease of entering and exiting the cab.
1.18	Door assist rails for crew cab doors	Two (2) assist bars will be provided and installed on the inside of the rear crew doors the full width of the window glass.

1.19	Cab width	Preference will be for a narrow width cab, but taking into consideration the engine and transmission size, while offering comfortable seating for (5) Turnout gear Equipped Fire Fighters seated safely within the cab. Driver / Officer /2 rear crew seats must be facing forward. 1 rear crew seat to face toward the rear.
1.20	Cab length	Shall be a suitable Medium 4 door sized cab
1.21	Crew floor	Preference shall be for a flat floor design for ease of all members entering and exiting from one side or another and shall be of “aluminum checker plate in all floor areas” meeting NFPA requirements
1.22	Visibility	Cab shall provide good visibility from seating positions.
1.23	Drip rails	Drip rails are to be included to aide in the prevention of water from cab roof running down the cab side
1.24	Cab Windows	Fixed cab side windows shall be installed behind the front cab doors and ahead of the crew doors and above the wheel well on each side of the cab. Widows shall allow for limited blind spots for occupants to have the best possible visibility.
1.25	Rear Cab Windows	The cab shall have two (2) fixed windows at the outer edges on the rear wall, allowing for crew members to look out of for view of on coming traffic prior to opening the doors. The windows shall be mounted using black self-locking window rubber
1.26	Cab Glass tint	Windows behind the drivers / officers side roll down windows shall come with a 50% graded tint. While Drivers and Officers door side glass and forward shall not come with any additional tinting.
1.27	Fluid checks	All fluids levels shall be able to be checked from drivers seat electronically: inclusive of; Transmission oil level, Engine oil level, Coolant level, Washer fluid level, Power steering oil level. Access to manual checking of fluids shall be obtained by Lifting the cab of the truck.
2.00	FR/EMS Compartment	There shall be a built in FR/EMS compartment as outlined below
2.01	General	The cab shall include a compartment located in the middle of the wall above the right side wheel well and below the window. This compartment shall be offset and measure 17.00 inches just inside the door opening offset to 24.00 inches wide X 28.29 inches high X 25.00 inches deep. The interior compartment height shall be 26.00 inches. The compartment shall be accessible from the outside of the cab through a hinged box pan door featuring a full length stainless steel piano style hinge and a bright aluminum tread plate inner panel, which shall open towards the front of the cab. The clear opening shall measure 24.60 inches tall X 15.00 inches wide. **The exact location, dimensions and design of the compartment is to be determined at pre-production meeting.
2.02	Interior	The floor of the compartment must be completely flat. There shall be a half shelf mounted on the forward wall, the depth of the compartment, protruding 9" from the forward wall, and 13" from the floor. The exact location, dimensions and design of the compartment is to be determined at pre-production meeting.
2.03	Outside Cab Exterior	The bottom and non-hinge side edges shall have stainless steel wrap around protectors.
2.04	Inside Cab Exterior Finish	The mid EMS compartment surfaces that are exposed to the interior of the cab shall be painted with a Zolatone type texture finish or equivalent.

2.05	Lighting internal of compartment	There shall be one (1) LED strip light installed to illuminate the exterior mid EMS compartment on the right side of the cab above the wheel well. The strip light shall be approx. 9.00 inches in length. The light shall be mounted in such a way that the compartment is sufficiently lit and the light is protected from being damaged.
2.06	FR/EMS Door Locks	Ability to lock the FR/EMS door with cab locks is preferred, otherwise manual door lock shall be supplied as an exception.
3.00	Cab Exterior	
3.01	Front Fascia	The front fascia will accommodate lights and accessories as specified herein.
3.02	Cab front grille	Shall be stainless steel and allow for the maximum allowable amount of air to pass through for sufficient cooling of the apparatus cooling systems.
3.03	Diamond Plate Aluminum - Cab Roof	Both outboard edges of the cab roof shall be covered with a 19" wide piece of aluminum tread plate for surface protection that meets NFPA requirements.
3.04	Windshield Wipers	Variable speed intermittent electric wiper(s) and windshield washers are to be provided. The location and sweep of the wipers must be able to sweep as much of the windshield as possible to provide good visibility to both driver and officer.
3.05	Windshield Wipers Interlock	When the park brake is applied, the windshield wipers will shut off and return to the park position
3.06	Washer fluid	Washer fluid shall be able to be checked and filled without the need to lift the cab
3.07	Mirrors	Two (2) West Coast style mirrors shall be provided. The mirrors shall be dual vision, motorized and heated with a flat 8" x 19" with a convex mirror at the lower portion of the mirror head. The drivers mirror head shall be mounted on stainless steel bow swing away type arms mounted to the cab door. The officer side mirror could be mounted forward of the door on the "A pillar" area to get unrestricted view, not blocked by Officer. Mirrors shall be heated and lighted by amber clearance lights with Chrome finish, or Surrey approved equal. The mirrors must be 4-way adjustable
3.08	Cross view Mirror	There will be a stainless steel convex cross view mirror installed on the front right side roof of the cab. The mirror will allow the driver to see down the front and side of the vehicle for added security. Mirror is to be installed on the right front corner of the cab, to view the front bumper area.
3.09	Front Bumper	A one piece wrap-around style, polished stainless steel front bumper shall be provided.
3.10	Bumper depth	The bumper shall be extended a approximately 24" ahead of the Cab
3.11	Bumper Apron	A 3/16" bright aluminum tread plate apron shall be installed between the bumper and the front face of the cab. Stainless steel bolts shall be used to attach the apron to the bumper flange.
3.12	Front Bumper Storage	There will be a storage well in the extended front bumper. The well will be located in the center over the chassis frame rails, and will be as large as possible to accommodate 150 ft. of 1 3/4" fire hose. There shall be a 2" lip along the front of the compartment to help retain the fire hose. The floor will be covered with removable interlocking tiles.
3.13	Front Bumper Trash line	Bumper Apron shall allow for 150' of 1 3/4" wet double jacket fire fighting hose with fog nozzle attached
3.14	Front Bumper Trash line cover	There will be one (1) aluminum treadbrite cover installed on the front bumper hose compartment.

3.15	Trash line bumper plumbing	Piping and hose connection shall be outside of the Trash line cover. Piping shall rise vertically out of the Bumper Apron on the left side of the Trash line with a polished chrome 90° swivel terminating with 2 1/2" BC thread port and 2.1/2" to 1 1/2" adapter
3.16	Air horns	(1) 21" air horn shall be recessed in the front bumper on the left hand Drivers side inboard mounting position.
3.17	Mechanical Siren	A Q2B electric / mechanical (or approved equivalent) siren shall be recessed in the right hand side (officer's side) of the front bumper. Only the motor will be recessed, with the front stator and grille protruding from the front face of bumper. Siren shall be capable of more than 120 decibels at 10'
3.18	Electric Siren	(1) ES100C (or approved equivalent) 100 watt siren speaker recessed mounted with chrome polished grill will be mounted on the outer left hand side of the front bumper extension
3.19	Tow Hooks	The bumper shall include two (2) painted tow hooks which shall be installed below the front bumper. These toe hooks shall be mounted to the frame and capable of being attached to in efforts to pull the apparatus in a recovery situation.
3.20	Cab Tilt	The cab tilt actuation shall be with an electric over hydraulic lift pump with a control box on a tethered pendant for safe visual operation. The cab will tilt to allow for ease of maintenance. The lift system will have an ignition interlock. It is necessary to have the master battery switch "on", ignition off, and the park brake set in order to tilt the cab.
3.21	Cab Tilt system override	The cab tilt system will include an electric over hydraulic pump as well as a manual pump for use in the event of an electrical failure. The electric over hydraulic pump should have a electrical connection to allow power directly to the pump. The cab shall tilt to 45 degrees.
3.22	Cab tilt Safety	Two (2) cab tilt cylinders will have a "velocity fuse" or another means to prevent the motion of the cab in the event of any hydraulic hose failure. A mechanical means of securing the cab in the elevated position to prevent accidental cab lowering must also be provided and must be integrated into the cab or cylinder design. The mechanical device design shall allow for the cab to drop into a rested state without stress put on to the structure. A cable release system shall also be provided to clear the safety assembly from the lift cylinder when lowering the cab and be accessed from the right side of the apparatus.
3.23	Cab tilt control	The tethered control shall be mounted on the right side of the apparatus behind a latched door on the right side pump panel. The control will have a locked down indicator lamp, which will illuminate when holding the "down" switch to indicate that the cab is secured and locked down.
3.25	Under Cab Engine work lighting	There should be (2) 4" LED work lamps installed mounted under the map light for area work lighting on the engine. The light will activate automatically when the cab is tilted.
3.26	Exterior Cab Assist Handles	Four (4) anti-slip one-piece exterior assist handles shall be installed, one (1) behind each cab door. The assist handle shall enable easy grabbing with the gloved hand.
3.27	Rear Cab Corners	Rear Cab corners shall have polished stainless steel trim running the height of the cab to assist in the protection the cab corners.
3.28	Wheel Well Liners	Full width, wheel well liners are to be installed.
3.29	Wheel Well Fenderette	Polished stainless steel fenderettes shall be installed at each wheel well

3.30	Shore Power inlet	A 20 amp electrical receptacle with a gray weatherproof cover and box. This shore power inlet is to be located in the driver's step area.
3.31	Outside Air Intake Connection	An air intake male Lincoln type connector shall be provided in the left cab step area for shoreline air intake to maintain air system build up. There shall be a one way check valve preventing back feeding of air once disconnected. The inlet is to be located in the Driver's mid height step adjacent to the shore power inlet. Can be reviewed at pre-production meeting
3.32	SS Exterior Body / Door trim	There shall be a stainless steel 10" trim along the lower part of the cab and doors, visually extending from the front bumper along the sides of the cab.
4.00	Cab Interior	
4.01	Mobile Data Terminal provision w/Glove compartment	Officer side dash trim panel shall consist of a high impact resistant Zolatone type coated aluminum module offering a Mobile Data Terminal provision above the glove compartment c/w computer slide out tray that won't interfere with the Occupant Protection System. The glove compartment shall come with a hinged non-locking door.
4.02	Engine Cover	The Engine cover shall be an integral part of the Cab. Shall provide quality insulation from the engine noise and heat. Covering material shall be constructed and sealed to prevent moisture contamination and debris build up.
4.03	Engine Cover Top Storage Compartment	There shall be a Custom built storage compartment to store binders and books installed to the rear of the engine cover. This cover is to be as wide as the engine cover, 12" high, 15" deep, c/w a hinged, latched lid. Forward of this compartment there is to be a lower, (approx. 6" high x 10" deep) compartment for storage of small items. This shall incorporate 2 cup holders. This compartment shall have a Zolatone type texture finish or equivalent. Exact location, dimensions and design, are to be determined at the pre-production meeting.
4.04	Air Horn Actuation	Air horns actuation shall be accomplished by the steering wheel horn button and a right side officer's push button switch located on the dash.
4.05	Horn Selector Switch	Switching for selection shall be installed in the Multiplexed display panel and shall be accessed by the driver and officer to allow control to either the air or electric horn from the steering wheel horn button. Electric horn will sound by default when selector switch is in either position (FMVSS requirement).
4.06	Dash	Preferred dash will be of "Extreme" or "Heavy Duty" duty design made constructed from aluminum and coated in a impact resistant Zolatone type finish
4.07	Starting System configuration	The preferred starting system to be supplied with the following:
		One (1) master battery switch.
		One (1) ignition switch.
		One (1) starter button.
		One (1) green LED indicator for battery "on".
		One (1) green LED indicator for ignition "on"

4.08	Center Dash Console panels	The main centered dash console shall be divided into (3) sections. (1) for the Driver, (1) for the Officer and one for center main middle panel for access by both driver and officer.
4.09	Officer side Center Console Dash Panel	The officer's side switch panel shall include two (2) momentary push button switches. One (1) shall operate the Electric/mechanical siren, which includes activation, off, and siren brake, and one (1) shall operate the air horns. These buttons locations shall be determined at the Pre-production meeting. A colour Multiplex display will be mounted to the left hand side of the panel
4.10	Center middle Console Dash Panel	The center main switch panel shall include six rocker switch locations with (5) LED backlit and labeled rocker switches mounted in the left hand side of the panel and (1) Dual USB port in the fourth place from the left . The single row of switches shall be located across the top left of the panel. The right hand section of the panel shall be left free to accommodate flush mounted equipment. There shall be Two (2) 12 volt cigarette lighter type receptacle will be provided in the cab dash on the officer's side to act as additional power source. From left to right: Chains, Spare, Spare, USB, Compartment Locks, Siren brake
4.11	Drivers side Center Console Dash Panel	The colour Multiplex display will be mounted in the right hand side of the panel. The driver's side panel shall include a rocker type headlight switch with instrument lamp slide dimmer, intermittent windshield wiper/washer switch.
4.12	Interior Colour	Any Vinyl trim shall be dark gray in colour. Floor will be Black in colour. The interior metal surfaces shall be painted with a "Zolatone type" black/gray texture finish.
4.13	Cab Interior Speaker Wiring	There shall be speaker wiring 16/2 from the centre top rear of the cab with a one foot pig tail, routed to the dash electrical centre cover with a three foot pig tail
4.14	Siren Control	There will be one (1) Federal model PA300MSC (or approved equivalent) electronic siren installed in the cab. Full features of the siren will include Wail, Yelp, Hi -Lo, Air Horn, and a hard-wired microphone. The siren will be flush mounted in the center console in the lower center area, reachable by both Driver and officer.
5.00	HVAC System	
5.01	General	An HVAC system will be provided to keep the tunnel and crew area as spacious as possible consisting of an overhead heater/defroster/air conditioning unit preferably mounted on the ceiling in a central location with dash-mounted controls. The HVAC system should include forward facing louvers for defrosting the windshield and rearward facing louvers to direct air at the crew, at the driver and officer.
5.02	Insulation	The sides, roof and rear wall of the cab will contain additional insulation to improve air conditioning and/or heating as well as reducing road noise.
5.03	Compressor	The air-conditioning compressor will be an engine driven and utilize R-134A refrigerant.
5.04	Heater hoses and clamps	All heater system hoses, including auxiliary units shall be silicone with stainless steel constant torque clamps approved for use with silicone hose.
5.05	A/C lines	The A/C lines will be a mixture of custom bent zinc coated steel fittings and Aeroquip flexible hose with E-Z clip fittings.
5.06	Defog / Defroster Fans	Four (4) electric defroster fans, two (2) are to be mounted at the top of the windshield, one (1) each side, two (2) are to be mounted in the rear of the cab. Exact location to be determined at pre-production meeting. They are to be switched at the fan.

5.07	Heater line isolation	The HVAC system will have a means of isolating the flow of engine coolant to the heater core either by manual or electric means.
6.00	Seats	
6.01	Seat cover	The seats shall be covered with a vinyl material.
6.02	Seat Colour	All seats supplied on the chassis shall be black in colour.
6.03	Drivers Seat	Shall be a Bostrom 500 Series Firefighter Sierra 4 way air model seat with air suspension. The seat shall have seat belts to seat (ABTS) style of safety restraint.
6.04	Officers Seat	Shall be a Bostrom 500 Series Firefighter Sierra 4 way air model seat with air suspension. The seat shall have seat belts to seat (ABTS) style of safety restraint.
6.05	Cab front Under seat storage	Under Drivers and Officer Seats there shall be a storage compartment with a hinged door and non-locking latch
6.06	Rear Facing Crew Seat	One (1) outboard rear facing crew area Bostrom Firefighter Fold & Hold Flip-Up 500 Series. Prefer the seat to be an ABTS (All Belts to Seat) type integrated red three-point shoulder harness with lap belt and an automatic retractor built into the seat assembly.
6.07	Forward Facing Crew Seats	There shall be (2) two forward facing crew area Bostrom Firefighter Fold & Hold Flip-Up 500 Series seats. Prefer the seat to be an ABTS (All Belts to Seat) type integrated red three-point shoulder harness with lap belt and an automatic retractor built into the seat assembly. Seats are to be separated as far apart as possible for additional shoulder room.
6.08	Forward facing Crew Under seat storage	A seat box approximately 42" wide x 12" high x 22" deep shall be installed against the center of the rear wall for seat mounting. The seat box shall be made from smooth aluminum and welded to the cab structure for seat mounting integrity. The seat box will be painted the cab interior colour. Both sides of the seat box shall have a hinged door with latch and an opening 15" wide x 10" high to allow access for storage in the seat box.
7.00	Instrument Panel	
7.01	Speedometer	One (1) electronic speedometer with integral digital odometer. The speedometer shall have a dual scale with kilometers per hour (KPH) as the dominant scale and miles per hour (MPH) on the minor scale . The speedometer scale shall read from 5 to 160 KPH (10 to 100 MPH). The odometer shall display kilometers.
7.02	Tachometer	One (1) electronic tachometer. The scale on the tachometer shall read from 0 to 3000 RPM.
7.03	Primary Air pressure Gauge	The scale on the air pressure gauges shall read from 0 to 140 pounds per square inch (PSI) . The air pressure scales shall be non-linear to expand the scales in the region of normal operation.
7.04	Secondary Air pressure Gauge	The scale on the air pressure gauges shall read from 0 to 140 pounds per square inch (PSI) . The air pressure scales shall be non-linear to expand the scales in the region of normal operation.
7.05	Fuel Gauge	The scale on the fuel level gauge shall read from empty to full.
7.06	DEF fluid Gauge	The scale on the DEF level gauge shall read from empty to full. With at least a full, 3/4, 1/2, 1/4 empty - gauge reading.
7.07	Instrument Annunciator	All indicator lights shall contain LED lamps.

7.08	Red Lamps	<ul style="list-style-type: none"> • Stop Engine - indicates critical engine fault. • Park Brake - indicates park brake is set. • Low Fuel - indicates low fuel. • Cab Ajar - indicates tilt cab is not locked down. • Volts - indicates high or low system voltage. • Low Oil Press - indicates low engine oil pressure. • High Coolant Temp - indicates excessive engine coolant temperature. • High Trans Temp - indicates excessive transmission oil temperature. • Low Air - indicates low air pressure in either system one or system two. • Low Coolant Level - indicates low engine coolant level. • Low Oil Level - indicates low engine oil level. • Air Filter - indicates excessive engine air intake restriction.
7.09	Yellow Lamps	<ul style="list-style-type: none"> • Check Engine - indicates non-critical engine fault. • Check Trans - indicates transmission fault. • ABS - indicates anti-lock brake system fault. • Water in Fuel - indicates presence of water in fuel filter. • Engine Maint - indicates engine maintenance is required.
7.10	Green Lamps	<ul style="list-style-type: none"> • Left and Right turn signal indicators. • Aux Brake Active - indicates secondary braking device is active. • High Idle - indicates engine high idle is active. • Low Trac - indicates low wheel traction for automatic traction control (ATC) equipped vehicles, also indicates mud/snow mode is active for ATC system.
7.11	Blue Lamps	<ul style="list-style-type: none"> • High beam indicator.
7.12	Audible Alarm	<p>The instrumentation system shall provide a constant audible alarm for the following situations:</p> <ul style="list-style-type: none"> • Low air pressure. • Low engine oil pressure. • High engine coolant temperature. • High transmission oil temperature. • Low coolant level. • High or low system voltage • Critical engine fault (Stop Engine).
7.13	Secondary Audible Alarm	<p>The instrumentation system will provide a three second alarm every three minutes for the following situations:</p> <ul style="list-style-type: none"> • Low fuel • Water in fuel
8.00	Manufacturer Label	
8.01	General	<p>A permanent plate will be mounted in a location that is easily visible from the driver's side door specifying the quantity and type of the following fluids that may be used in the apparatus for normal maintenance. Where a fluid is not applicable to the unit, the plate will be marked N/A to inform the service technician who may not be familiar with the apparatus.</p>

8.02	Fluid type and Capacity	The following fluids as a minimum will be listed on that plate: <ul style="list-style-type: none"> • Engine oil • Engine coolant • Transmission fluid • Pump transmission fluid • Pump primer fluid • Drive axle fluid • Air conditioning refrigerant • Power steering fluid • Cab tilt mechanism fluid • Transfer case fluid • Equipment rack fluid • Air compressor system lubricant • Generator system lubricant • Front tires air pressure • Rear tires air pressure
8.03	Seating Capacity	A permanent plate will be affixed in the driver's area that states the maximum number of personnel allowed to ride on the apparatus at any time.
8.04	Height / Length / GVWR	A sign will be affixed in the chassis cab, in plain sight of the driver that states the overall travel height, overall length, and gross GVWR of the apparatus.
8.05	Other	All other appropriate labels to ensure safe operation of the apparatus will be permanently affixed in conspicuous locations.

III - CHASSIS		
Index #	Item	Specification
1.00	Chassis	
1.01	General	All major equipment that is added to the chassis, such as transmission, transfer case, pump, etc. are to be mounted in such a way as to allow for removal of each component, without requiring the cutting out of chassis cross members, other body modules or chassis reinforcements. The frame parts which are not galvanized shall be powder coated prior to any attachment of components.
1.02	Frame & Cross Members	Frame & Cross members shall be constructed with Grade 8 zinc coated fasteners; "huck" bolts shall not be acceptable. Drilling on chassis frame flanges or welding to chassis frame shall not be permitted. The frame shall be galvanized to prevent corrosion.
1.03	Frame Stamped S/N	Apparatus Vehicle Identification Number shall be stamped into the Frame rail.
1.04	Frame Rail yield strength	110,000 psi minimum yield high strength low alloy steel.
1.05	Frame Rail minimum Resisting bending moment (RBM)	Resistance Bending Moment (RBM) minimum of 3,921,500 inch pounds. The frame option will suit a 100' mid mount platform unit
1.06	Frame finish	Frame shall triple channel be galvanized coated with a finish to prevent corrosion. Any finish applied to the Frame shall be applied before airlines and electrical wiring are installed. Axles, driveline running gear, battery boxes, air tanks and other assorted chassis mounted components shall be painted with standard black paint.

1.07	Cross-member finish	Frame shall be coated with a finish to prevent corrosion. Any finish applied to the Frame shall be applied before airlines and electrical wiring are installed.
1.08	Auto Greasing	The unit shall come with an auto greasing system for the chassis, preferred brand - Groeneveld.
1.09	Wheelbase	Wheelbase shall be appropriate for the mounting of a mid mount 100' ladder platform with as little rear overhang as possible
1.10	Overall Length	The basket platform should not hang over the rear of the apparatus body
2.00	Alignment	
2.01	General	The chassis frame rails shall be cross-checked for length and squareness. The front and rear axles are to be laser aligned. The front tires and wheels are to be aligned and toe-in set. Alignment must be properly set on a fully loaded truck.
2.02	Alignment certificate	Certified Alignment documentation required.
3.00	Steering	
3.01	General	The Goods shall be equipped with a hydraulic power steering sufficient for the weight and application of the vehicle. Steering system should allow for ease of steering for the driver to safely operate the vehicle and perform tight turning as required within confines of city congestion.
3.02	Steering Column	The steering column will be telescopic, tilt and height adjustable. Hydraulic power steering assist required and will come complete with a horn button self-cancelling turn signal switch and four-way hazard switch.
3.03	Cramp Angles	Turning Cramp angles shall be approximately 48 degrees in either direction.
4.00	Suspension	
4.01	Axle configuration	6 x 4 (single steer axle / tandem drive axle)
5.00	Front Axle	
5.01	Front Axle GAWR	Approx.24,000 lb capacity *The mass of the apparatus, when fully outfitted and loaded as per this standard, shall be a minimum of 10% less than the GVWR of the chassis. Axle shall be built for severe duty and loads as specified herein. **Air Ride suspension or independent front suspension is not preferred.
5.02	Front Springs	The spring capacity will meet or exceed the capacity of the front axle. Suspension shall be built for severe duty and loads as specified herein. **Air Ride suspension or independent front suspension is not preferred.
5.03	Front Shock Absorbers	Two (2) mono-tubular design, gas charged shock absorbers will be part of the front axle suspension package. The shocks shall be warranted for a period of five (5) years.
5.04	Front Wheels	There will be two (2) 22.5" x 13" front Alcoa or equivalent polished aluminum, hub piloted 10 stud disc wheels. Shall come with wheel saver gaskets. Wheels shall not come dressed with any nut covers or hub caps

5.05	Front tires	Front tires 445/65R-22.5 20PR shall be designed to meet or exceed the demands of the application. The front tire stamped load capacity shall be 24,600 pounds per axle with a nominal speed rating of 68 miles per hour when properly inflated to 120 pounds per square inch. The transmission/speedometer gear to be matched to the wheel/tire size. Independent tire loading must be less than 100 kg/cm of tire width as per British Columbia Motor Vehicle Act Regulations. Tires to come with pressure monitoring.
5.06	Front Axle Cramp Angle	The chassis shall have a front axle cramp angle of 48-degrees to the left and right.
5.07	Front Wheel Bearings Oil Lubricated	The front axle wheel bearings shall be oil lubricated and come equipped with an oil level visual inspection window.
6.00	Rear Axle	
6.01	Tandem Rear Axle GAWR	Approx. 63,000 lb *The mass of the apparatus, when fully outfitted and loaded as per this standard, shall be a minimum of 10% less than the GVWR of the chassis. **Air Ride suspension is not preferred.
6.02	Rear Suspension	The rear tandem suspension shall be Ridewell Dynalastic model RD-202, incorporating a straddle mount pedestal and urethane pivot bushings, preset load distribution and independent axle movement. Four accordion elastomer springs and four shock absorbers shall be provided to allow dampening of axles on jounce and rebound. The suspension shall have 54" axle centers and have a rated capacity of 63,000 pounds GAWR.. **Air Ride suspension is not preferred .
6.03	Rear Shock absorbers	Four (4) mono-tubular design, gas charged shock absorbers will be part of the suspension package. The shocks shall be warranted for a period of five (5) years.
6.04	Rear Axle	The rear tandem drive axle will be a Meritor axle or approved equivalent, adequate for severe duty and the loads as specified herein and have oil lubricated wheel bearings. The rear axle ratio to provide for a normal driving speed between 50 to 70 km/h and a maximum road speed of 110 km/h.
6.05	Type	The rear drive axle will be full floating and of sufficient size to transmit the full torque of the engine / transmission.
6.06	Traction control	The rear axle will have traction control with a "mud and snow" feature installed, as well as an interaxle lock.
6.07	Remote vents	The vents will be extended to provide a ground clearance of a minimum of 48" to prevent water from entering the differential.
6.08	Rear Wheels	There are to be eight (8) rear 22.5' x 8.25' Alcoa or equivalent polished aluminum, hub piloted 10 stud disc wheels. Shall come with wheel saver gaskets. Wheels shall not come dressed with any nut covers or hub caps
6.09	Rear Tires	The rear tires shall be 12R-22.5 16PR "H" tubeless radial mixed service tread. The rear tire stamped load capacity shall be 27,120 pounds per axle with a nominal speed rating of 75 miles per hour when properly inflated to 120 pounds per square inch.
7.00	Brakes	
7.01	General	The brake system will meet as a minimum, the testing requirement set out in NFPA 1901 - latest edition and SAE J-992. A rapid air build up air brake meeting CMVSS – 121 system and in compliance with NFPA 1901 - latest edition will be provided.

		Shall include advanced braking and protection systems
7.02	Advanced Braking systems	• Automatic Braking System
		• Automatic Traction Control
		• Electronic Stability Control w/ Roll Stability Control
		• The system shall have a minimum of (3) year or 300,000 km warranty provided by the system manufacturer
7.03	Advanced Braking System Diagnostics	Diagnostic Software shall be included for the Advanced Braking systems, and shall provide warning to the driver of a system malfunction.
7.04	Air Compressor	Shall be provided with an air compressor suitably sized for the demands of the system within this spec. Preferred Air Compressor shall be a Bendix BA-921 or equivalent. Minimum CFM shall be 17 due to the demands of the Air Primer system. Wabco® SS318, 18.7 CFM.
7.05	Air Tanks	There shall be suitably sized wet, primary and secondary tank systems for the braking system
7.06	Aux Air Tank	An additional 1200 cubic inch air reservoir shall be installed and isolated to prevent depletion of the air to the air brake system and to act as a supply tank for operation of non-brake air components. It shall be plumbed with a 90 psi pressure protection valve on the reservoir supply side in such a way that it does not have any effect on the primary or secondary air system. To be best plumbed off the wet tank.
7.07	Air Tank Mounting	Air tanks shall be suitably mounted with brackets that allow space between the tanks and the frame rails
7.08	Nylon Air line tubing	The dual air system shall be plumbed with colour coded reinforced nylon tube air lines. The primary (rear) brake line shall be green, the secondary (front) brake line red, the parking brake line orange and the auxiliary (outlet) will be blue. • Brass compression type fittings shall be used on the nylon tubing. All drop hoses shall be fiber reinforced neoprene covered hoses.
7.09	Remote Manual Air tank drains	Remote manual drains shall be installed on all reservoirs of the air brake system. All drains are to be remote located to below L1 and name tagged, c/w quarter turn pet cocks (Milton type preferred). Cables are not preferred.
7.10	Air Dryer	Air Dryer / system saver with replaceable spin-on desiccant filter and 12 volt 100 watt automatic heated moisture ejector shall be installed. Air dryer shall come with a three (3) year or 300,000 km warranty
7.11	Brakes - Front	Approved Front Disc Type Air brakes 17 inch vented rotors, with automatic adjustment
7.12	Brakes - Rear	Approved Rear Drum Air brakes 16.50 inch X 7.00 inch S-cam drum type. designed for the application and specification herein. S-Cam type with ArvinMeritor automatic slack adjusters. Brake dust shields shall be installed.
7.13	Rear Brake Chambers	The rear axle shall include MGM tandem 30/36 long stroke brake chambers

7.14	Front Wheel Service Brake lock up system	A front wheel service brake lock-up system shall be installed which will apply both the front air and rear spring tires upon application of the PP-1 push-pull valve in the cab.
7.15	Outside Air Intake Connection	A quick release outside air intake male connector shall be provided in the left cab step area for shoreline air intake to maintain air system build up. The air connector supplied shall be compatible with a Lincoln fitting. The inlet is to be located in the Driver's mid height step towards the of the step adjacent to the shore power inlet.
8.00	Driveshaft's	
8.01	General	The drive shafts on the chassis will be balanced and have "glide coat" splines on all slip shafts and be able to with stand the full torque developed by the engine and transmission.
8.02	Temporary Driveline	A temporary jackshaft driveline shall be installed by the chassis manufacturer to accommodate the mid-ship transfer case to drive the pump as specified by the apparatus manufacturer.
9.00	Fuel Tank	
9.01	General	Shall adhere to NFPA 1901 - latest edition
9.02	Mounting straps	The fuel tank shall be mounted with Stainless steel "U" straps with rubber isolation padding between the strap and the tank, tank and the frame rails.
9.03	Location	The fuel tank shall be mounted behind the rear axle and below the frame and as centered as possible between the frame rails.
9.04	Type	The fuel tank shall be a baffled design.
9.05	Vent port	There shall be a vent port for facilitating venting the top of the fill neck to allow rapid filling without "blow-back"
9.06	Rollover valve	There shall be a rollover ball check valve for temperature expansion and draw
9.07	Fill port location	The fuel fill port shall be located on the right / curbside of the apparatus, please consider options to fuel from both sides of the vehicle due to fuel station configurations.
9.08	Fill port type	Fill port shall be a 2" NPT port with cap
9.09	Fuel Tanks Access	There shall be service access to the top of the fuel tank, senders, fuel lines, and mounting straps.
9.10	Fuel Lines and Wiring	Lengths of fuel lines and wiring to fuel sender shall allow for lowering of the tank without the need to remove lines and wiring prior to lowering the tank. The fuel lines shall be wire braid
9.11	Drain Plug	There shall be a ½" NPT drain plug on the bottom of the tank.
9.12	Coating	The tank shall be coated with an anti-corrosive exterior metal treatment finish.

9.13	Capacity	The fuel capacity shall be approximately 68 gallons and shall allow the engine to drive the pump for 2 ½ hours at rated pump capacity at 150 psi (1000 kPa) net pump pressure and at the suction conditions specified in this standard or to operate at 60 percent of gross engine horsepower for 2 ½ hours, whichever is greater.
9.14	Electric Fuel Primer Pump	An electric fuel primer pump shall be provided
10.00	Automatic Tire Chains	
10.01	General	An OnSpot or approved equivalent Automatic Tire chain system shall be installed on the front rear drive axle of the chassis. The system shall include a switch on the dash with protective lock out within easy reach of the driver.
10.02	Tire Chain Interlock	The tire chains shall be interlocked with the transmission and shall engage only if the vehicle is traveling 50 KPH or less. After traveling over 50 KPH, the vehicle must be reduced to a speed below 8 KPH for the tire chains to be engaged or re-engaged.

IV - ENGINE AND TRANSMISSION		
Index #	Item	Specification
1.00	Engine / Power-Plant	
1.01	General	An internal combustion diesel engine of suitable size to operate all the equipment necessary as specified on the truck and able to power a loaded apparatus without undue hardship on the engine or powertrain components shall be supplied. Engine rating shall not be at the upper limits of its design standards. Cummins is the preferred engine option.
1.02	NFPA	The Goods will meet NFPA 1901 - latest edition apparatus and road performance standards as well as the road test standard understanding the preference for the narrowest width cab and desire for the overall length of the apparatus to be as short as possible.
1.03	EPA	Engine will be EPA certified to meet the current emissions standards as required for Emergency response fire apparatus. Engine must be able to operate on B5 biodiesel fuel. Preference will be for engine to safely operate also on B20 biodiesel fuel.
1.04	Engine protection alarm	An automatic visible and audible engine alarm for low oil pressure and or high and low coolant temperature will be installed in the cab and pump panel. The system will not allow the engine to de-rate if apparatus is being operated in pump mode.
1.05	Emergency Shut down	Two (2) emergency shut down controls are required one (1) at the pump panel and one (1) in the cab.
1.06	Diagnostics	Trouble /diagnostic codes shall be accessible from the drivers seat without the need for laptop or external connections of equipment.
1.07	Alternator	Approximate 320 amp rated alternator. Preference to pad mount design.
1.08	Starter	Heavy duty 12 volt gear reduction type electric starter with over crank and thermal protection. Preference to a 39MT or equivalent.

1.09	Weight to Power Ratio	With consideration to the end product and the truck manufacturers responsibility to match the horsepower requirement for the truck to perform all operations, there is a preference for the Engine / Power-plants weight to power ratio to be as close as possible to 100lbs per HP based on GVW and shall not exceed 110lbs per HP based on GVW, while meeting these requirements.
1.10	Horse Power Rating	Provide Horse Power rating charts as per SAE J1312 in accordance with J1349 - See Weight to Power ratio.
1.11	Fuel type	Diesel
1.12	Number of Cylinders / configuration	In-line 6
1.13	Displacement	Approx. 15 litres
1.14	Torque Rating	Provide Torque curve charts as per SAE J1312 in accordance with J1349
1.15	Engine Brake	Engine shall come equip with an Engine compression brake
1.16	Engine Brake controls	Settings shall be programmable to allow for the engine brake controls to be Off/High/Med/Low settings, or as the City deems is best, for the operation. The default should be to the high setting.
1.17	High Idle	High Idle speed shall be 1250 RPM
1.18	High Idle control	There shall be a manual High Idle switch in the cab and an automatic setting for High idle as battery voltage requires.
1.19	Engine Idle	Engine Idle Speed shall be 700 RPM
1.20	Drain plugs	Draining of fluids from engine shall be accessible in such a way not to allow for needless spillage on other components. Direct line of sight draining to floor shall be required for both engine oil and coolant. Coolant drain shall be a tap or petcock design. Engine oil drain shall utilize a magnetic drain plug.
1.21	Air Cleaner	The air cleaner shall be a dry type with a replaceable element, it shall have an outside air intake with an ember separator filter, positioned to avoid rain water or road splash water pickup.
1.22		There shall be an indicator light in the warning light cluster to show when the air cleaner element requires replacement.
1.23		There shall be a mechanical vacuum filter minder gauge to determine air filter quality without the need of electronics.
1.24	Oil filter(s)	Shall be easily accessible for maintenance and service. Shall not require tilting of the filter upon installation or removal

1.25	Fuel Filter(s)	There shall be a primary and secondary filtration system in place to ensure the cleanest possible fuel is attained. This shall be inclusive of a Fuel / water separator and water sensor with dash audible and visual warning for when water is present. Filters shall be easily accessible for Maintenance and servicing. Tilting of the filters, allowing spillage of fuel, upon removal and installation shall not be acceptable for maintenance and servicing. There shall be a fuel shut off valve on the draw line at the primary fuel filter to allow the ease of changing the fuel without excessive fuel spillage.
1.26	Fuel system Primer	The fuel system shall include an electric fuel primer to draw fuel from the fuel tank to the primary fuel filter.
1.27	Engine Fluid fills	All engine fluids shall be filled from under the cab
1.28	Engine Fluid Levels	All engine Fluid levels shall be able to be checked electronically from driver's seat and manually from under the Cab.
1.29	Turbo Charger	VGT Turbocharger is preferred
1.30	Engine Warranty	The engine and after treatment systems shall have minimum of five (5) year 160,000 km warranty as standard. Additional warranty options shall be provided, including any additional cost
2.00	Engine Exhaust System	
2.01	General	The exhaust system will help the engine meet the current EPA standards and is designed for emergency applications (short trips, high idle).
2.02	Exhaust location	The exhaust pipe will be of a horizontal design that extends the exhaust outlet forward of the rear dual wheels, exiting to the right side at a 90 degree angle to the body. The end of the exhaust pipe to be flush to the side of the body and mounted below the body by a minimum of 1.5".
2.03	Exhaust extraction plate	A Exhaust Extraction anchor plate will be installed center to center 24" above the exhaust pipe.
2.04	Engine Exhaust Wrap	The exhaust tubing between the engine turbo and the diesel particulate filter (DPF) shall be wrapped with a thermal cover in order to retain the necessary heat for DPF regeneration. The exhaust wrap shall also help protect surrounding components from radiant heat which can be transferred from the exhaust.
2.05	DEF	With the restrictions surrounding the DEF fluid and tank it should be noted that the fluid should be filled from the Drivers / street side of the apparatus. The means of filling of the fluid should ensure that any spillage should not cause damage to any other components by means of corrosion or contamination. This shall include but not be limited to Electrical components, batteries, wire harnesses, etc. minimum size shall be 6 gallons.
2.06	DPF system	Diesel Particulate Filter and system shall be easily serviceable. All components surrounding the system shall be protected for heat dissipation coming from the extreme temperature of the exhaust system.
3.00	Cooling System	
3.01	General	The cooling system will have sufficient capacity to keep the engine properly cooled under all conditions of driving or pumping operations and will be designed to meet or exceed the engine and or transmission manufacturer and EPA requirements. The complete cooling system will be mounted to isolate the entire system from vibration or stress.

3.02	Components	The cooling system will consist of the following main components: surge tank, an air to air charge air cooler mounted in front of the radiator, a shroud, a fan and required tubing. The engine cooling system will include a recirculation shield designed to act as a light duty skid plate below the radiator. The cooling system will have a complete de-aeration system capable of removing entrapped air from the system and equipped with drain cock to drain the coolant for serviceability.
3.03	Expansion Tank	The cooling system will be equipped with a separate expansion tank that allows the system to be filled and will include a low coolant probe and the ability to check the coolant level without removing the cap. The shall easily see the level of the coolant in the expansion tank from the ground. A low engine coolant indicator light and alarm shall also be provided.
3.04	Radiator	The radiator shall be a cross-flow design constructed in a manner so it can be re-buildable. Radiator shall be mounted in such a way that the twisting of the frame under normal operations does not cause harm to the radiator or housing
3.05	Coolant / Antifreeze	The coolant package shall include Extended / Long Life coolant as approved by the engine manufacturer.
3.06	Secondary Engine cooling	A supplementary single bundle type heat exchanger will be provided to allow the use of water from the discharge side of the fire pump to cool the engine coolant. It will be plumbed as to not allow water from the fire pump to intermix with the engine coolant. The heat exchanger is to be installed between the engine and the radiator without a shut-off valve. A stainless steel valve on the pump operator's station will control this cooling system, labelled Engine Cooler.
3.07	Cooling system hoses and clamps	All cooling system hoses shall be made of silicone and routed to limit chaffing or damage from other components. Clamps shall be stainless steel and designed for use on silicone hoses, as well they should provide constant torque to ensure appropriate level of torque can be achieved to seal the hose without damage to the hoses or clamps.
3.08	Engine Fan	Fan shall be a one piece molded polymer fan with shroud. The fan shall be thermostatically controlled
3.09	Engine Fan Shroud	A shroud and recirculation shield system shall be used to ensure air that has passed through the radiator is not drawn through it again.
3.10	Charge air cooler	Shall be designed for and approved by the engine supplied in the spec. Hose shall be silicone based with approved clamps.
3.11	Water cooled	Shall utilized long life coolant/antifreeze
3.12	Coolant / Water Filter	Shall have a Water / Coolant filter easily accessible for servicing. There shall be shut-off valve(s) to ensure limited loss of coolant while servicing the system.
3.13	Low Coolant Indicator Light and Tone Alarm	A low engine coolant indicator light located in the warning lamp center in the instrument panel shall be provided. In addition an audible tone alarm shall be provided to warn of low coolant condition.
4.00	Transmission	
4.01	General	Transmission shall be designed for the conditions and demands of Fire / Emergency response. Preference for an Allison transmission. Shall be sufficiently built for duty to the accordance to the size, weights, power, operation and speeds set out within these specifications.
4.02	Type	Automatic Transmission

4.03	# of Speeds	Preference will be for 6 forward speeds and 1 reverse.
4.04	Fluid checks	Fluid level checks shall be accessible from the driver's seat electronically and under the cab manually.
4.05	Diagnostics	Trouble /diagnostic codes shall be accessible from the driver's seat without the need for laptop or external connections of equipment.
4.06	Transmission oil	Transmission shall be filled with long life synthetic oil approved by the Transmission manufacturer.
4.07	Top Gear	There shall be an option for lock out for the top gear with the need for the driver to override to attain when needed.
4.08	Shift Selector	The transmission shall have an electronic push button shift selector mounted within suitable distance from the driver's seat
4.09	Transmission / Auxiliary Brake Pre-select	When the auxiliary brake is engaged, the transmission shall automatically shift to the next lower gear, and continue to shift to the next lower gear as vehicle slows assisting the braking system and slowing the vehicle.
4.10	Transmission Oil cooler	The transmission shall include a water to oil cooler system located in the cooling loop between the radiator and the engine. The transmission cooling system shall meet all transmission manufacturer requirements. The transmission cooling system shall feature continuous flow of engine bypass water to maintain uninterrupted transmission cooling
4.11	Transmission Warranty	The transmission shall be warranted for a minimum of five (5) years with unlimited mileage. Parts and labor shall be included in the warranty. Details of additional warranty and costs shall be provided.
4.12	PTO	A PTO shall be installed on the transmission by the OEM. The clutched shifted PTO is designed specifically for the transmission and provides an intermittent and continuous torque rating of 360 lb. ft. The PTO, which drives the hydraulic pump, shall meet all the requirements for the aerial unit operations. An amber light shall be installed on the cab instrument panel to notify the operator that the PTO is engaged.
4.13	PTO Location	The transmission shall have two (2) power take off (PTO) mounting locations, one (1) in the 8:00 o'clock position and one (1) in the 1:00 o'clock position. 2015-030 LH PTO Ctrl Rkr Enable "Aerial Master"/Rkr Actv "Aerial PTO"
4.14	PTO Switches	Switches for the power take off shall be wired to the V-mux node to be used by the OEM. There shall be an on/off rocker switch labeled "Aerial Master" wired to a V-mux input and output with integral light wired to the v-mux input terminal of the switch that shall illuminate when the switch in on and the v-mux output is active. There shall be an on/off rocker switch labeled "Aerial PTO" activated by the "Aerial Master" rocker switch with an input to the V-mux node when the switch is on and an integral light activated by an independent V-mux output. The switches shall be located on dash.

4.15	Hydraulic Pump	The hydraulic system shall be supplied by a pressure compensated, load sensing, variable full type pump. The pump shall provide adequate fluid volume to allow all ladder functions to operate simultaneously, without noticeable loss of speed. The pump shall supply oil only when the ladder is in motion, thereby preventing overheating of the hydraulic oil. An interlock shall be provided that shall allow operation of the aerial device PTO shift only after the chassis spring brake has been set and the chassis transmission has either been placed in the neutral position or the drive position if the driveline has been disengaged from the rear axle. The pump shall also provide power for the hose bed system.
4.16	Hydraulic Pump	The hydraulic pump for the generator system shall be connected to the chassis transmission through a "Hot Shift", electrically engaged power-takeoff system. The control to engage and disengage the power-takeoff system shall be installed in the chassis cab. The hydraulic system should included a variable displacement piston pump to supply hydraulic power to drive the Onan 8RBAB 8000 watt generator

V - GENERATOR		
Index #	Item	Specification
1.00	Auxiliary Power Unit	
1.01	General	The unit will be equipped with an hydraulically driven generator. A hydraulic pump will driven off the transmission PTO vis a "hot shift". It will supply power to but not limited to the following features/components of the apparatus: - all 120/240V systems acting as the system generator. The unit should have a minimum of a 5 year/1000 hour warranty. Provide extended warranty options.
1.02	Preferred Operation	<p>The generator, when activated, shall supply power for the following features/components of the apparatus:</p> <ul style="list-style-type: none"> • AC generator features (lights, cord-reel, chargers for small tool batteries, etc....)
1.03	Alternative	The Onan generator 8RBAB, 8000 watt specified is intended to provide information on what is currently used in our operation, however, the final design requirements is ultimately the responsibility of the Contractor to meet operational and performance requirements.
1.04	Mounting Location	The generator shall be mounted on the forward most upper part of the Fire Body above the pump module as centered to the Fire Body as spatial requirements allow for weight distribution. There shall be adequate air flow and ventilation as so the generator unit may safely operate without overheating.
1.05	Cover	A tread plate cover will be installed over the generator. The cover will be designed in such a manner as to allow for easy access to the generator when performing routine maintenance. The cover will also be designed in compliance with the generator manufacturer's air flow requirements.
2.00	System Components	
2.01	Generator	Preference for the 120v/240v 66.6/33.3 amps 60 hertz generator to provide a minimum of 8000 watts output.
3.00	Controls	
3.01	General	A LED generator display meter shall be provided with the generator. The display meter shall automatically sense a generator signal and begin displaying information. The digital meter display shall constantly monitor and display voltage, frequency, and amps. The display shall be capable of displaying total accumulated run time hours when the MODE button is pressed once. Press the MODE button twice to display the temperature of the oil returning to the oil reservoir.

3.02	Display	The display shall provide the user with the following information:
		Voltage
		Amps
		Run time indicator
		Frequency
		Mode button
		Oil temp returning to reservoir
3.03	Remote Start Switch	A remote start switch should be installed on the pump panel for the generator
3.04	Transfer Switch	A transfer switch should be installed that will automatically switch from the 120-volt shoreline power to 120-Volt generator power when required. The transfer switch shall be in close proximity to the load center.

VI - PUMP		
Index #	Item	Specification
1.00	Pump	
1.01	Alternatives	The pump and valves preferences specified are intended to provide information on what is currently used in operation, however, the final design requirements is ultimately the responsibility of the Contractor to meet operational and performance requirements.
1.02	Single Stage Fire Pump	The pump shall be a single stage centrifugal class "A" rated fire pump, designed specifically for the fire service. The preferred pump shall be capable of 2250 GPM at 150 psi. The entire pump will be assembled and tested at the pump manufacturer's factory.
1.03	Current Fleet Standard Pump	For comparison information: The standard SFS Frontline Pumper apparatus are outfitted with both Hale Qmax and Waterous CSU pumps. With the most recent being a Waterous CSU2250. Our preference is Waterous, to try to keep our fleet as standard as possible for operations, training and maintenance. The midship pump/gearbox provisions shall be for a Waterous CSUC20 pump
1.04	Midship Mounted Fire Pump	The pump shall be a Mid-ship mounted pump with a split shaft transmission design

1.05	Pump Body	The pump body and related parts shall be of fine grain alloy cast iron, with a minimum tensile strength of 30,000 PSI. All moving parts in contact with water shall be of high quality bronze or stainless steel. Pumps utilizing castings made of lower tensile strength cast iron are not acceptable. The pump body shall be split, on a single plane in two sections for easy removal of the entire impeller assembly, including wear rings and bearings from beneath the pump, without disturbing piping or the mounting of the pump. The pump shall have one (1) double suction impeller. The pump body shall have two (2) opposed discharge volute cut waters to eliminate radial unbalance. The pump shaft shall be rigidly supported by three bearings for minimum deflection. One high lead bronze sleeve bearing shall be located immediately adjacent to the impeller. The sleeve bearing shall be lubricated by a force-fed, automatic oil lubricated design, pressure balanced to exclude foreign material. The remaining bearings shall be heavy-duty, deep groove ball bearings in the gearbox and they shall be splash lubricated.
1.06	ULC Pump Certification	<p>The fire pump will be tested and certified by Underwriters Laboratories of Canada, to perform as listed below:</p> <ul style="list-style-type: none"> • 100% of rated capacity at 150 psi net pressure. • 70% of rated capacity at 200 psi net pressure. • 50% of rated capacity at 250 psi net pressure. <p>The entire pump, both suction and discharge passages, will be hydrostatically tested to a pressure of 600 PSIG, with a maximum discharge pressure of 400 PSIG.</p> <p>The pump will comply with the applicable requirements of "Standard for Automotive Fire Fighting Apparatus" CAN/ULC-S515, latest revision. The pump will be free from objectionable pulsation under all normal operating conditions. The pump will be certified in imperial gallons per minute (IGPM) and a ULC certificate to be provided at time of delivery. Pump ULC information to be stamped on a plate and installed on truck.</p>
1.07	Pump Mounting	The frame mounted pump module will be designed to protect components and be mounted in such a way as to allow easy access for service, repair and replacement of all components. The point where the pump module is mounted to the frame will be reinforced appropriately to carry the expected load for the life of the apparatus.
1.08	Pump Plumbing and piping	The entire pump, both suctions, discharge passages, both intakes and discharge valves and all plumbing are to be hydrostatically tested to a pressure of 600 PSI. All piping and fittings will be stainless steel and rated for high pressure. Stainless steel Victaulic couplings will be utilized where necessary for ease of service. Any flexible piping will be constructed with stainless steel couplings and used where necessary to prevent undue stress in the plumbing system.
1.09	Anodes	There is to be sufficient sacrificial anodes installed in the pump to prevent corrosion as per manufacturer's recommendation and will easily replaceable on both intake and discharge sides of the pump.
1.10	Over Heat Protection	There will be a Pump Manufacturer specific Overheat Protection Manager (OPM), installed on the pump. There will also be a warning light on the pump panel.
1.11	Pump / Engine Heat Exchanger	The chassis' engine that provides the power to drive the fire pump, will have a supplementary cooling system installed between the engine and the radiator that uses water from the discharge side of the pump to cool the engine coolant through the use of a closed heat exchanger. The water from the pump and the engine coolant will not be intermixed. This cooling system will be controlled by a valve on the pump operator's panel, and will be clearly labeled "Engine Cooler". To prevent damage from freezing, the heat exchanger will be plumbed through the master pump drain.

1.12	1/2" Pump Cooler Line	There will be a 1/2" line installed from the discharge side of the pump to the water tank. The line will be used to cool the pump during long periods of pumping when water is not being discharged. The pump cooler will be controlled with a quarter-turn ball valve on operators panel, and will be clearly labeled "Pump Cooler".
1.13	Pump Cooler Check Valve	There will be a check valve installed in the pump cooler line to prevent tank water from back flowing into the pump when it is not in use.
1.14	Mechanical Seal	The pump shall be equipped with mechanical seals. The mechanical seals shall be spring loaded, maintenance free and self-adjusting. Mechanical seal construction shall consist of a carbon sealing ring, stainless steel coil spring, Viton® rubber cup, and a carbide seat with Teflon® backup seal.
2.00	Transfer Case	
2.01		The pump transmission transfer case will be rigidly attached to the pump body assembly and be of the latest design incorporating a high strength unit capable of handling the maximum torque developed by the engine.
2.02		The pump and transmission will be easily separable. A two (2) piece shaft will be splined, allowing for individual repair of either the pump or transmission.
2.03		The pump shift mechanism will have an internal positive locking mechanism to insure that the transfer case stays in road or pump position.
3.00	Pump Controls	
3.01	Air Operated Pump Shift	The pump shift actuating mechanism will be air operated from a valve in the cab identified as "PUMP SHIFT". Full instructions for shifting the pump will be inscribed on the valve plate.
3.02	Manual Override Pump Shift	A manual override system will be supplied for the pump shift should a problem develop in the chassis air brake system. This is not to be remote mounted to the pump panel with a cable, it is to have a handle direct mounted to the pump shift shaft. An additional interlock be provided that prevents the pump from being taken out of "pump " position if neutral on the transmission has not been selected. There shall be a Label on the Pump Panel with instructions for Manual Override Pump Shift.
3.03	Dash Pump Shift Indicating lights	There are to be two (2) green pump system shift indicator lights in the chassis cab labelled: (1) Pump Engaged - illuminates when the chassis parking brake has been set and the pump has completed its shift into pump gear.(2) OK to Pump - illuminates when the pump and the chassis transmissions have been shifted completely into the correct gears for pumping.
3.04	Pump Panel Indicating light	One (1) green pump system shift indicator light will be provided on the pump panel labelled "OK to Pump". This light will only become engaged when the chassis parking brake has been set, and when the pump and the chassis transmissions have been completely shifted into the correct gears. The light will be located adjacent to the throttle control and will be labeled "Warning: Do Not Open Throttle Unless Light Is On".

3.05	Pressure Governor	Apparatus shall be equipped with a Class 1 "Total Pressure Governor" (TPG++) (or equivalent) that is connected to the Electronic Control Module (ECM) mounted on the engine. It will operate as a pressure sensor (regulating) governor (PSG) utilizing the engine's J1939 datalink for optimal resolution and response provided that J1939 is supported by the engine manufacturer. If J-1939 engine control is not supported, then analog remote throttle control shall be provided by the TPG+, subject to J1939 RPM data availability. Shall utilize control algorithms that minimize pressure spikes during low or erratic water supply situations and display operational status messages to the operator under certain circumstances. The TPG+ shall be backwards compatible to any engine that supplies J1939 RPM, Temperature and Oil Pressure information providing the ability to maintain consistent fleet fire-fighting capability.
3.06	Pressure Governor	TPG++ shall incorporate two 600 PSI transducers for best operation. PSG system diagnostics shall be built in and accessible by service technicians. Programmable pre-sets for RPM and Pressure settings shall be easily configurable. The TPG+ shall incorporate configurable parameters in the menu structure accessed through a diagnostic password. The "TPG+" shall also include indication of engine RPM, system voltage, engine oil pressure and engine temperature complete with audible alarm output for all. The "TPG+" uses the J1939 data bus for engine information, requiring no additional sensors to be installed. The TPG+ shall use J1939 broadcast warnings for the alarm points as a standard. The TPG+ shall be mounted on the pump panel in a convenient spot for viewing that will not be obstructed by hose or anything else. Exact location to be determined at pre-production meeting.
4.00 Primer		
4.01	Priming Pump Control	The Priming Pump will be controlled at the pump operator's panel. The control will be provided in the form of a push-button switch that is easily actuated with a gloved hand.
4.02	Primer	The priming pump will be an environmentally safe priming system. The Primer shall be a Air Venturi type system. Preferred system will be a 3 barrel design Trident Auto Air Priming system. To be best plumbed off the Aux Air Tank.
5.00 Pump Valves		
5.01	General	Except where noted, the preference shall be for all manual valves will be Akron 8800 series or Elkhart Unibody (or equivalent), quarter-turn, full flow, swing-out type. The flow regulating element of each valve will not change its position under any condition of operation involving discharge pressures to the maximum pressure of the pump. The means to prevent a change in position will be incorporated in the operating mechanism and will be permitted to be manually controlled. NOTE: All electric valves are preferred to be Elkhart Unibody (or approved equivalent).
5.02	Intake & Discharge port locations	NOTE: All Intake ports shall be located below the plain of the Steamer Port while all discharge ports shall be located above the Steamer Port. Final locations for controls and pump panel configurations will be determined at the Pre-production meeting. All Panel configurations must be approved and signed off prior to build.
5.03	Slow Close Mechanisms	Gated intakes and discharges that are 3" or larger will be equipped with a mechanism to prevent changing the position of the valve from full open to full close, or vice-versa, in less than 3 seconds as required by NFPA - latest edition.
5.04	Valve Controls	All valves will be controlled by electric controllers c/w flow meter & psi gauge. These valves shall have the ability to be greased, and shall have grease lines routed to a central point for the ease of greasing

5.05	Tank to Pump Check valve	There will be a check valve between the pump suction and the booster tank valve. The check valve will eliminate back flow into the water tank when the pump is connected to a pressurized source.
5.06	4" Tank to Pump Valve	There will be one (1) 4" electric full flow ball valve connected with a flexible hose from the tank to the pump. The tank to pump valve will be controlled from the pump operator's panel by an electric controller. 4" Tank to Pump.
5.07	2" Tank Fill Valve	There will be one (1) 2" full-flow tank fill valve plumbed with 2" plumbing from the pump to the tank. Installation will be completed with 2" high pressure flex hose. Stainless steel hose couplings will be utilized. The tank fill valve will be controlled from the operator's control panel.
5.08	6" Steamer Suction inlets	There will be two (2) 6" male steamer inlets, one (1) on each side of the apparatus. The suction fittings will include a removable die cast zinc screen to provide cathodic protection for the pump thus reducing corrosion.
5.09	6" Left Side Steamer Inlet	A short steamer barrel shall be installed to accommodate an intake valve without exceeding the legal overall body width. There shall be one (1) South Park model LHC26P14AC (or equivalent), 6" NST long handle steamer cap provided. The cap shall be manufactured from high quality brass that shall be polished to remove manufacturing irregularities with a chrome finish applied to the polished surface.
5.10	Short Steamer Barrel - Right Side	To accommodate an intake valve without exceeding the legal overall body width, a shorter steamer barrel will be installed on the right side of the apparatus.
5.11	Right Side Steamer Remote Intake Valve (Electric)	<p>The right steamer will be equipped with a Monarch intake valve. The valve will be a full flow butterfly type designed to mount on the fire pump between the suction extension and the suction tube behind the pump panel.</p> <p>A pressure relief valve will be provided that is factory set to 125 PSI and field adjustable from 75 to 250 PSI. The pressure relief valve will provide overpressure protection for the suction hose even when the intake valve is closed.</p> <p>The inlet valve will be operated by a 12 VDC electric motor with remote capabilities. The valve will be provided with a panel placard indicating control operations. The placard will have status lights to indicate whether the valve is open, closed, or traversing from one position to another.</p> <p>A panel mounted manual override will be provided to permit operation of the electric control valve in the event of abnormal operating conditions. The manual override will be designed to permit operation of the valve without the use of special tools or disassembly of the pump panel or valve.</p>
5.12	Bleeder Valve	There will be an air bleeder valve, provided on the pump panel for the steamer/intake equipped with the remote intake valve. The valve will be used to bleed off air or water as per NFPA - latest edition requirements. The air bleeder control shall be located on the left side pump operator's panel.
5.13	Steamer Inlet Adapter	There will be one (1) lightweight aluminum 30 degree elbow provided. Threads shall be: 6" swivel female NST with long handles to 4" Storz. The adapter shall be located on the right 6" steamer inlet.

5.14	4" Storz Cap & Chain	There will be one (1) lightweight aluminum 4" Storz cap provided. A chain attachment will be also supplied. The Storz blind cap shall be located on the right 6" steamer inlet adapter. One (1) 6" NST chrome plated long handle steamer cap will be provided.
5.15	Pump Drain Valve	A mechanical drain valve assembly will be supplied. This drain will provide the capability to drain the entire pump by a single control. The drain valve control will be mounted on the left side pump panel and identified as "Master Drain".
5.16	Intake Relief Valve	There will be an intake relief valve installed on the suction side of the pump. The valve will be the pre-set type, adjustable from 75 to 250 PSI, and will be designed to prevent vibration from altering the setting. The relief outlet will be directed below the pump with the discharge terminating in a 2-1/2" male NST connection. The discharge will be away from the pump operator and labeled "Do Not Cap". The intake relief valve discharge shall be located below R1 compartment, for ease of connecting a hose.
5.17	Gated Suction Inlets	<p>All suction valves, unless otherwise noted in the specifications, will be brass, quarter-turn, full flow, and swing-out type. Each valve will be designed in such a manner that the action of water against the regulating element will not affect its position.</p> <p>Each valve will be individually attached to the manifold of the pump with schedule 40 galvanized pipe. The plumbing to the valve will contain a minimum of elbows to keep friction loss to a minimum.</p> <p>The valves located in the pump compartment area will be partially recessed behind the panel with the portion of the valve that contains water protected from the elements.</p>
5.18	Intake Drains	Each gated intake will be equipped with a Class1 3/4" quarter turn bleeder valve. The bleeder valve will be equipped with a chrome plated handle to provide a positive grip while personnel are wearing gloves.
5.19	Intake Trim Plates	Each gated intake will have a polished cast aluminum or stainless steel trim plate around the intake valve and fitting. The trim plate will be easily removable without the need to disturb the valve.
5.20	Intake Strainers	Removable / replaceable strainers will be provided with each intake.
5.21	Left Side 2-1/2" Gated Intake	<p>There will be one (1) 2-1/2" gated intake provided on the left side of the pump compartment. The intake will be furnished with a 2-1/2" Akron valve and 2-1/2" plumbing. The intake will terminate with a 2-1/2" BCT female chrome swivel.</p> <p>The control for this valve shall be in the DOWN position when CLOSED, and in the UP position when OPEN.</p> <p>There will also be a 2-1/2" BCT rocker lug plug with Chrome finish provided on the adapter. A retention chain will be included with the plug. Elkhart valve to match other valves is preferred.</p>
5.22	Right Side 2-1/2" Gated Intake	There will be one (1) 2-1/2" gated intake provided on the right side of the pump compartment. The intake will be furnished with a 2-1/2" Elkhart Unibody valve and 2-1/2" plumbing. The intake will terminate with a 2-1/2" BCT female chrome swivel. There will also be a 2-1/2" BCT rocker lug plug with chrome finish provided on the adapter. A retention chain will be included with the plug.

5.23	Right Side 4" Gated Intake	There will be one (1) 4" gated intake provided on the right side of the pump compartment. The intake will be furnished with a 4" Elkhart Unibody electric valve and 4" plumbing. The intake will terminate with a 4" Storz adapter. A pressure relief valve shall be provided that is factory set to 125 psi and field adjustable from 75 to 250 psi. The pressure relief valve shall provide overpressure protection for the suction hose even when the intake valve is closed. The outlet of the pressure relief valve will have 2-1/2" NPT threads to allow directing the discharge flow away from the pump operators position. There will be one (1) 4" Storz blind cap with chain attached to the panel
6.00 Crosslay Configuration		
6.01	General	<p>Crosslay pre-connects will have 90 degree elbow type swivel on discharge outlets. These discharge outlets will be mounted as close to the middle of the crosslay bed as possible to allow the hose to be drawn easily off either side and to create hose kinking. The flooring will be punched to allow for adequate ventilation and drainage and decking in place.</p> <p>The dividers between the hose bed areas will be fabricated of 3/16" aluminum. It will be mounted in a channel on each end for adjustability. There shall be 2 dividers Allowing for 3 separated crosslay beds.</p>
6.02	Abraded Finish Crosslay Hose bed dividers	The crosslay hose bed and dividers will have a maintenance free abraded finish.
6.03	Horizontally Split Crosslay Storage	<p>There shall be two (2) horizontally split hose storage areas installed between the crosslay sidewall and divider. The split hose storage areas shall allow for storage of two (2) lines in the crosslays. The horizontal divider shall be Flip up shelves constructed of aluminum floors that rest on two angles for ease in reloading hose. These angles are to be bolted to the vertical dividers for any future up/down adjustment.</p> <p>The double stack 1-1/2" and 2-1/2" double stack Crosslay hose beds shall have a mid height flip up shelf.</p> <p>The flip up shelves are to be positioned at 17" from the floor in crosslay #2 (1-1/2") and 18" from the floor in crosslay #3 (2-1/2").</p>
6.04	Vinyl Crosslay Cover	The crosslays shall have a vinyl coated nylon cover installed. The front edge of the cover shall be retained in a "C" channel to prevent wind from lifting it. The back of the cover shall be attached to the apparatus body with Velcro. The end covers shall be incorporated into the top cover. The cover shall be black in colour.
6.05	Crosslay configuration	<p>The pre-connect hose beds shall be sized to accommodate the following hose load:</p> <ul style="list-style-type: none"> · Crosslay #1 – Shall measure a Approx. 5" wide · Crosslay #2 – Shall measure a Approx. 7" wide · Crosslay #3 – Shall measure a Approx. 10" wide

6.06	1-1/2" Crosslay	<p>There will be two (2) 1-1/2" crosslays above the side mount control panel. Each crosslay will be plumbed with a full-flow 2" Elkhart (or equivalent) valve. High pressure flex hose with stainless steel couplings will be used in plumbing the discharge to an 1-1/2" Male swivel elbow. These discharge outlets will be mounted as close to the middle of the crosslay bed as possible to allow the hose to be drawn easily off either side and to create hose kinking. The 90 degree elbow swivel on the discharge outlet will terminate NPHS thread.</p> <p>Each crosslay hose bed will have a capacity of 200' of 1-3/4", double jacket fire hose.</p> <p>Crosslays are to hold the following hose configuration:</p> <ul style="list-style-type: none"> · 150' of 1-3/4" double jacket fire hose - pre-connect, single stack. · 200' of 1-3/4" double jacket fire hose - pre-connect, double stack.
6.07	2-1/2" Crosslays	<p>There will be one (1) 2-1/2" crosslay above the side mounted operator's control panel. These crosslays will each be attached to the Right side pump panel 2 1/2" discharges. Each crosslay hose bed will have a capacity of 200' of 2-1/2" double jacket fire hose.</p> <p>Each crosslay is to hold the following hose configuration:</p> <ul style="list-style-type: none"> · 200' of 2 1/2" pre-connect, double stack.
6.08	2 1/2" Discharge Adapters	<p>Each 2 1/2" crosslay will come with a rigid female to male adapter with rocker lugs provided. Threads will be: 2-1/2" NST female x 2-1/2" BCT male. The adapter shall be located on each of the 2-1/2" crosslays.</p>
6.09	Crosslay Rollers	<p>Stainless steel rollers will be provided at each end of the crosslay hose bed to facilitate deployment of hose. Vertical rollers will be installed on each side of the hose bed opening, and a horizontal roller will be installed under the opening.</p>
6.10	Drain Valves	<p>Each discharge 2-1/2" or larger, with the exception of the crosslays and hard to access plumbing, will be equipped with a 3/4" quarter turn Class1 (or equivalent) drain between the valve and the discharge. There will be a chrome plated round handle provided on each drain valve to facilitate use with a gloved hand.</p> <p>Drain valves will be located in a row just above the running board and below the pump panel on each side of the apparatus pump compartment to reduce clutter in the pump panel area. Each drain valve will be colour coded to match the appropriate line it is connected to. The drain valves will be connected to the individual valves with flexible hose that is routed in such a manner as to assure complete drainage. Discharge from the drain valves will be routed to below the apparatus.</p>
6.11	Automatic Drains	<p>Crosslay and hard to access discharges will be equipped with Class1, model 34AD automatic drains (or equivalent). These drains will open whenever the pressure in the discharge line drops below 5 PSI. The drains will be located in areas that will allow the entire line to drain effectively. More than one drain will be used in lines that are uneven along their length.</p> <p>Where the drain valve is located above the frame rails of the chassis, the outlets will be extended with hoses to below the chassis frame rails.</p>
6.12	Discharge Elbows	<p>All discharges that are 2" or larger and are 42" or more above grade will be equipped with a downward pointing elbow of 30 degrees or more.</p>
6.13	Discharge Caps	<p>All discharges, except for those designated as pre-connects, will have a chrome cap. Caps for discharges 2-1/2" and smaller will be secured to the apparatus with suitable chains.</p>

6.14	Discharge Trim Plates	Each gated discharge will have a polished cast aluminum or stainless steel trim plate around the discharge valve and fitting. The trim plate shall be easily removable without the need to disturb the valve.
6.15	Right Side 2-1/2" Discharges	<p>There will be two (2) 2-1/2" NST discharges on the right side of the pump compartment located conveniently together. These discharges will be plumbed with 2-1/2" electric valves c/w electric controllers and 2-1/2" plumbing for higher pressure operation.</p> <p>Plumbing, valves, controllers and gauges shall be capable of the maximum discharge pressure of the pumps capabilities. These valves are to be supplied by the pump manufacturer.</p> <p>These discharges will have appropriate and identified gauges and flow meters.</p>
6.16	Right Side 2-1/2" Discharge Adapters	<p>Each Right Side 2 1/2" discharge will have a rigid female to male 30 degree adapter with rocker lugs and Chrome finish provided. Threads will be: 2-1/2" NST female x 2-1/2" BCT male.</p> <p>The adapters shall be located on the right pump panel 2 1/2" discharge.</p>
6.17	Front Bumper 2-1/2" Discharge - (Trash line)	There will be one (1) 2-1/2" NST discharge installed to the left side of the front bumper. The discharge will be plumbed with a 2-1/2" Elkhart valve and 2-1/2" plumbing. High pressure flex hose with stainless steel couplings will be used in the plumbing of this discharge.
6.18	Chrome Discharge Swivel - (Trash line)	The front bumper discharge will be equipped with a chrome swivel. The swivel assembly will have a 2-1/2" victaulic pipe end and a 2-1/2" male NST end. The swivel will have a specially designed elbow that reduces friction loss.
6.19	Discharge Adapter - (Trash line)	<p>There will be one (1) rigid female to male adapter with rocker lugs and Chrome finish provided. Threads will be: 2-1/2" NST female x 2-1/2" BCT male.</p> <p>The adapter shall be located on the front bumper pre-connect.</p>
6.20	Discharge Adapter - (Trash line)	<p>There will be one (1) rigid female to male adapter with rocker lugs and Chrome finish provided. Threads will be: 2-1/2" BCT female x 1-1/2" NPSH male.</p> <p>The adapter shall be located on the front bumper pre-connect adapter.</p>
6.21	Right Side 4" Large Diameter Discharge	There will be one (1) 4" NST discharge located on the right side pump panel. The discharge will be plumbed with an electric 4" Elkhart valve and 4" plumbing. The 4" discharge to be controlled by an electric controller c/w flow meter.
6.22	Elbow Adapter - Right Side 4" Large Diameter Discharge	<p>There will be one (1) lightweight aluminum 30 degree elbow provided. Threads shall be: 4" swivel female NST with rocker lugs to 4" Storz.</p> <p>The adapter shall be located on the 4" LDH.</p>
6.23	Discharge Adapter - Right Side 4" Large Diameter Discharge	<p>There will be one (1) 4" to 2-1/2" lightweight aluminum adapter provided. Threads shall be: 4" Storz with lugs with manual locks x 2-1/2" rigid male BCT.</p> <p>The adapter shall be located on the 4" LDH.</p> <p>There will also be a 2-1/2" BCT rocker lug cap with chrome finish provided on the adapter. A retention chain will be included with the cap.</p>

6.24	Aerial Waterway Discharge	The aerial waterway shall be plumbed from the pump to the turntable with 5" stainless steel pipe and a 4" EB40 Elkhart Unibody valve.
6.25	Aerial Waterway Hand Wheel Actuated Control	The aerial waterway discharge valve shall be controlled by an electric actuator. The electric actuator shall have a 25:1 gear ratio, which actuates from fully open to fully close in eight (8) seconds, a clutchless motor, and utilizes an electric controller with current limiting design. Opening and closing speed shall comply with the current NFPA Standard to minimize effects of water hammer.
6.26	Aerial Waterway Valve	The valve shall be actuated by an Elkhart Brass, model E14X, electric actuator installed on the valve. An Elkhart Brass APEX 300 Electric Valve Controller shall be provided.
6.27		Pipe should be hot dipped galvanized and then the exterior of the pipe is chromed
6.28	Controller	The controller should be capable displaying valve position on 3.5" LCD display.
6.29	Valve Controls	All 2-½" or smaller valves shall be controlled by a Trident quarter turn locking type push/pull control with direct linkages and universal yokes. Control rods shall be hard coated anodized aluminum ¾" rod and polished chrome plated zinc handles. The centerline of any valve control shall be no more than 72" vertically above the platform that serves as the pump operator's position.
7.00	Foam System	
7.01	General	The apparatus shall be equipped with a electronic, fully automatic, variable speed, direct injection, discharge side foam proportioning system. The system will be capable of handling Class A foam concentrates and most Class B foam concentrates.
7.02	Alternative	The Foam System specified is intended to provide information on what is currently used in operation, however, the final design requirements is ultimately the responsibility of the Contractor to meet operational and performance requirements.
7.03	Previous / current system	Hydro Foam Pro 2002 - (or equivalent) Components included in the system: <ul style="list-style-type: none"> • Operator Control and display • One (1) Paddle wheel Flow meter • Electric motor drive pump • Wiring Harnesses • Foam Injection Check valve • One (1) Low Level Foam Tank Switch

7.04	Digital display	<p>The digital computer control display will enable the pump operator to perform the following control and operation functions for the foam proportioning system:</p> <ul style="list-style-type: none"> • Provide push-button control of foam proportioning rates from 0.1% to 9.9% in 0.1% increments. • Show current gallon-per-minute water flow rate. • Show total gallons of water discharged, during and after foam operations are completed. • Show total gallons of foam concentrate consumed. • Simulate flow rates for manual operation. • Perform set-up and diagnostic functions for the computer control microprocessor. • Flash a low concentrate warning when the foam concentrate tank runs low. • Flash a no concentrate warning and shut the foam concentrate pump off, preventing damage to the pump, should the foam tank empty. 										
7.05	System Capacity	<p>System Capacity will be as follows:</p> <table border="0"> <thead> <tr> <th>Foam Concentrate</th> <th>2002 Maximum Water Flow GPM (LPM)</th> </tr> </thead> <tbody> <tr> <td>0.2%</td> <td>2500 (9464)</td> </tr> <tr> <td>0.5%</td> <td>1000 (3785)</td> </tr> <tr> <td>1.0%</td> <td>500 (1893)</td> </tr> <tr> <td>3.0%</td> <td>166 (628)</td> </tr> </tbody> </table>	Foam Concentrate	2002 Maximum Water Flow GPM (LPM)	0.2%	2500 (9464)	0.5%	1000 (3785)	1.0%	500 (1893)	3.0%	166 (628)
Foam Concentrate	2002 Maximum Water Flow GPM (LPM)											
0.2%	2500 (9464)											
0.5%	1000 (3785)											
1.0%	500 (1893)											
3.0%	166 (628)											
7.06	Foam System Plumbing	<p>The foam system will be plumbed to the following discharges:</p> <ul style="list-style-type: none"> · 2-1/2" Front Bumper discharge, · (1) 1-1/2" crosslay, · (1) 1-3/4" crosslay, · 2-1/2" crosslay, · aerial waterway. <p>Shut off valves shall be installed on foam tanks to allow for maintenance downstream from the tanks, so tanks do not have to be emptied.</p>										
7.07	Foam Refill System	<p>The apparatus will be equipped with an electronic, automatic concentrate refill system. It will be separate from the proportioning system to allow for simultaneous operations. The system will be capable of handling Class A or Class B foam concentrate. The apparatus will be plumbed from the externally accessed intake/flush port to the foam cell. The external intake/flush connection will be quick connect, cam-lock type and incorporated a check valve to prevent backflow. The refill line will be positioned in the lower portion of the foam cell to minimize agitation. The refill operation will be based on direct measurement of the concentrate level in the cell and the refill pump intake performance.</p>										
7.08		<p>The system must be capable of automatically stopping when the foam cell is full and warn the operator when the concentrate source is empty or any other conditions preventing flow occurs. The system will be equipped and electronic control suitable for installation on the pump panel. Incorporated within the control will be a microprocessor that receives input from the system while also monitoring foam concentrate pump output. An all bronze three-way valve will be included to allow that operator to flush the system after use.</p>										

7.09	Foam Refill system Pump	A 12-volt electric motor driven positive concentrate pump, with a minimum of 10 gpm @ 20 psi rating, with concentrate viscosity exceeding 5500 cps, will be installed per manufacturer recommendations. A pump motor electronic driver will receive signals from the computer control display and power the electric motor directly coupled to the concentrate pump. The system will receive readings when the concentrate tank is full and stop operation to prevent overflow. The system will terminate operations when flow is not detected on the intake side for 12 seconds.
7.10	Bypass System For Aerial Waterway	There shall be a bypass system provided with the Foam System that shall allow the aerial to either flow water or foam. The bypass shall be plumbed into the aerial waterway with 3" plumbing and an Elkhart Unibody 3" valve. The bypass valve shall be controlled by a Hand wheel. The hand wheel worm gear shall be connected to the remote mounted valve via a rod assembly. The hand wheel shall turn a gear sector mounted on the valve for smoother and easier operations under pressure. A position Indicator shall show the position of the ball valve as per NFPA 1901. Opening and closing speed shall comply with the current NFPA Standard to minimize effects of water hammer.
8.00	Tanks and Gauges	
8.01	Polypropylene Foam Cell	<p>There will be one (1) 25 imperial gallon polypropylene foam cell incorporated into the polypropylene water tank.</p> <p>There will be one (1) pressure/vacuum vent installed on the foam tank.</p> <p>There will be one (1) drain hose connected to the foam cell. The drain will have a 1/4 turn valve installed inside the pump house and it will drain below the frame rail of the chassis.</p>
8.02	Preferred Foam Tank Level Gauge	<p>The apparatus shall be equipped with one (1) Class1 " Intelli-Tank " Level Gauge (or equivalent) for indicating foam level. The Tank Level Gauge shall indicate the liquid level on an easy to read LED display and show increments of 1/8 of a tank. The tank shall include a shut off valve on the supply line from the tank. Each tank level gauge system shall include:</p> <ol style="list-style-type: none"> 1) A pressure transducer that is mounted on the outside of the tank in an easily accessible area. Sealed foam tanks will require zero pressure vacuum vents. 2) A super bright LED 4-light display with a visual indication at nine accurate levels. 3) A set of weather resistant connectors to connect to the digital display, to the pressure transducer and to the apparatus power.
8.03	Water Tank	The water tank will have a capacity of 500 Imp Gallons. Certification of the tank capacity to be recorded on the manufacturer's record of construction and to be provided to the purchaser upon delivery of the apparatus.
8.04	Tank Construction	The Poly-Tank will be constructed of 1/2" thick polypropylene sheet stock. This material will be a noncorrosive stress relieved thermoplastic, black in colour, and U.V. stabilized for maximum protection.

8.05	Tank Baffles	The transverse swash partitions will be manufactured of 3/8" polypropylene (natural in colour) and extend from approximately 4" off the floor to just under the cover. The longitudinal swash partitions will be constructed of 3/8" polypropylene (natural in colour) and extend to the floor of the tank through the cover to allow for positive welding and maximum integrity. All partitions will be equipped with vent and air holes to permit movement of air and water between compartments. The partitions will be designed to provide maximum water flow. All swash partitions will interlock with one another and be welded to each other as well as to the walls of the tank.
8.06	Tank Sump	There will be one (1) sump in the bottom of the water tank. The sump will be constructed of 1/2" polypropylene and will be located in the left front quarter of the tank. On all tanks that require a front suction, a 4" schedule 40 polypropylene pipe will be installed that will incorporate a dip tube from the front of the tank to the sump location. The sump will be used as a combination clean-out and drain. All tanks will have an anti-swirl plate located approximately 2" above the sump to pre-vent air from being entrained in the water while pumping.
8.07	Tank Fill Connection	All tank fill couplings will be backed with flow deflectors to break up the stream of water entering the tank, and will be capable of withstanding sustained fill rates of up to 1,000 GPM.
8.08	Tank Lid	The tank lid will be constructed of 1/2" thick polypropylene to incorporate a multi three-piece locking design that allows for individual removal and inspection if necessary. The tank lid will be recessed 3/8" from the top of the tank and will be welded to both sides and longitudinal partitions for maximum integrity. Each one of the lids will have hold downs consisting of 2" polypropylene dowels spaced a maximum of 30" apart. These dowels will extend through the covers and will assist in keeping the covers rigid under fast filling conditions. A minimum of two lifting dowels will be drilled and tapped 1/2" x 13" to accommodate the lifting eyes.
8.09	Tank Mounting	<p>The tank will rest on the body cross members in conjunction with such additional cross members, as required by the tank manufacturer.</p> <p>The tank will be isolated from the cross members through the use of hard rubber strips with, a minimum Rockwell Hardness of 60 durometer. Additionally, the tank will be supported around the entire perimeter and captured both front and rear as well as side to side to prevent the tank from shifting during vehicle operation.</p> <p>Although the tank will be designed on a free floating suspension principle, it will be required that the tank have adequate hold down restraints to minimize movement during vehicle operation.</p> <p>The tank will be completely removable without disturbing or dismantling the apparatus structure.</p>
8.10	Cradle For Water Tank Mounting	The tank carrier shall be designed specifically for this apparatus. The carrier structure shall be supported by and welded directly to the top plate of the torque-box.

8.11	Tank Fill / Vent	The tank will have a combination vent and manual fill tower marked "Water Fill." The fill tower will be constructed of 1/2" polypropylene and will be a minimum dimension of 8" x 8" at the outer perimeter. The tower will be located in the left front corner of the tank. The tower will have a 1/4" thick removable polypropylene screen and a polypropylene hinged-type cover. Inside the fill tower, approximately 4" down from the top, will be fastened a combination vent overflow pipe. The vent overflow will be a minimum of schedule 40 polypropylene pipe that is designed to run through the tank, and will be piped behind the rear wheels so as to obtain maximum traction.
8.12	Tank Drain Valve	One (1) 1-1/2" tank drain valve will be provided under the tank sump. The valve will have a locking lever to prevent accidental draining of the tank. The valve must be easily accessible.
8.13	Preferred Pump panel Water Tank Level Gauge	<p>The apparatus will be equipped with one (1) Class 1 Intelli-Tank™ water tank level gauge (or equivalent) provided on the pump operators control panel. The water tank level gauge shall indicate the water level on an easy to read LED display and show increments of 1/8 of a tank. The tank level gauge system will include:</p> <ol style="list-style-type: none"> 1) A pressure transducer that is mounted on the outside of the tank in an easily accessible area. 2) One (1) super bright LED 4-colour light display with a visual indication at nine accurate levels. 3) A set of weather resistant connectors to connect to the digital display, to the pressure transducer and to the apparatus power. 4) A Remote Driver Module to provide 7.5 amps per output (X4) and mimics the function of the Master Tank Level Display .
8.14	Preferred External Cab mounted Water Tank Level Indicator Lights	The apparatus will be equipped with two (2), Whelen PSTANK four colour LED water tank level status lights. Green light indicates a full tank, blue is half, amber is a quarter full and red means empty. There will be one light assembly mounted on each side of the cab at the top rear corner. Exact location to be determined at the pre-production meeting.
9.00	Pump House	
9.01	Independent Pump Compartment	The main body and the pump compartment will be fabricated as individual units. Both the body and pump compartment will be fabricated using precision holding fixtures to ensure proper dimensions. All attachment points will be heavily reinforced. The approximate width of the pump house shall not exceed 50".
9.02	Stainless Screws	Stainless steel screws will be provided throughout the body in locations such as: overlays, pump panels, and other numerous hardware mounting locations.
9.03	Left Side Modular Running Board	A modular running board will be installed on the left side of the pump compartment module. The running board will be constructed of non-slip treadbrite. The outside edge of the running board will be flush with the rub rail that is installed on the body to maintain a uniform appearance. All running boards will be installed with sufficient support to form a sturdy, non-deflecting step area for personnel.

9.04	Left Side Pump Operator's Platform	<p>An Innovative Industries (or equivalent) pull out platform shall be provided at the pump operator's control panel that can support a maximum of 500 pounds. The top surface of the platform shall be constructed of aluminum serrated bar grating for ease of maintenance and to provide a slip resistant surface for the operator. The platform shall lock in both the retracted and the extended position. The pull out platform shall be wired to the door ajar circuit.</p> <p>The pull out platform roller assembly shall have a powder coat finish for added corrosion protection.</p>
9.05	Right Side Modular Running Board	<p>A modular running board will be installed on the right side of the pump compartment module. The running board will be constructed of non-slip treadbite. The outside edge of the running board will be flush with the rub rail that is installed on the body to maintain a uniform appearance.</p> <p>All running boards will be installed with sufficient support to form a sturdy, non-deflecting step area for personnel.</p>
9.06	Right Side Pump Operator's Platform	<p>An Innovative Industries (or equivalent) pull out platform shall be provided at the right side pump panel that can support a maximum of 500 pounds. The top surface of the platform shall be constructed of aluminum serrated bar grating for ease of maintenance and to provide a slip resistant surface for the operator. The platform shall lock in both the retracted and the extended position. The pull out platform shall be wired to the door ajar circuit.</p> <p>The pull out platform roller assembly shall have a powder coat finish for added corrosion protection.</p>
9.07	Pump Panel Vertical Hose Compartment - Right	<p>There will be soft suction hose compartment vertically recessed in the pump panel on the right side.</p> <p>The hose well shall hold 50' of 5" hose. The LDH roll measures 9"W X 26"H X 17"D.</p> <p>The bottom of the hose well is to be ramped.</p> <p>There is to be a strap provided with the pump panel hose compartment. The strap will be installed on the compartment to retain the hose.</p>
10.00	Pump Panels	
10.01	Main Pump Control Panel	<p>The left side of the pump enclosure will be divided into two sections. The lower section will be where all valve controls, the primer control, the discharge relief valve controls (pilot valve), and other mechanical controls are located. This surface will be referred to as the "control panel".</p> <p>All valve controls will be the self-locking type, activated by either direct control or with a direct linkage utilizing friction locking bell cranks and universal ball swivels. The primary valve handles will have colour coded tags installed in a recessed area to clearly denote the purpose of each control.</p>
10.02	Approval of design and layout	<p>Exact lay out and design of Pump Panels shall be reviewed at Pre-production meeting will be signed off for approval prior to build.</p>

10.03	Instrument Panel	The surface above the control panel will contain all instruments, gauges, test fittings, and optional controls. This surface will be referred to as the "instrument panel". The instrument panel will be independent and hinged, on the forward edge, and latched so that it may be opened. All instruments, gauges, and other equipment will be installed with sufficient slack in any cabling, tubing, or plumbing to allow the panel to swivel to the fully open position.
10.04	Colour Coded Labels	To improve identification of discharges and intakes, colour coded tags will be provided. The tags will utilize an etching process to provide easy visibility and improved field service life. Tags will be affixed using an industrial grade adhesive backing, eliminating the need for pop rivets or screws into the panel or control handle. As well there shall be colour coded bezel decals shall be utilized to clearly identify valves, gauges and crosslays. Each discharge shall have its own colour to coordinate with the current colour coding of the SFS pump panels
10.05	Right Side Pump Panel	A single panel will be installed on the right side of the pump enclosure. This will be the area where any right side discharges, inlets, steamers, and other pump associated equipment are located. This panel will be easily removable. It will be fully removable for pump and plumbing access without the need to use hand tools. Any electrical equipment that may be installed will be equipped with connectors so they may be easily separated from the opening created when the below described front access panel is removed.
10.06	Pump Panel Lights	<p>The pump operator's control panel and the right side pump panel will each be illuminated by On Scene Solutions LED light strips. Each light assembly will have a plastic or Lexan lens to protect the lamp from the elements.</p> <p>The pump panel lights will become energized upon setting the parking brake so the gauge information provided may be consulted at any time the apparatus is parked.</p> <p>A stainless steel shield will be installed over the pump panel lights to further protect them from the elements and to act as a reflector for additional illumination.</p>
10.07	Panel Surfaces	The control panel, instrument panel, and right side pump panel will be fabricated from a minimum of 16 gauge stainless steel with brushed finish.
10.08	Pressure / Vacuum Test Ports	Class1 model 102709 pressure and vacuum test ports will be provided on the pump panel.
10.09	Pump Cooler Valve	Class1 model 34BV pump cooling control valve will be provided on the pump panel
10.10	Engine Cooler Valve	Class1 model 34BV engine cooling control valve will be provided on the pump panel
10.11	White Face / Black Numeral Gauge Display	The master pump gauges and individual pressure gauges will have a white face with black numbers and lettering. This will provide a high contrast and allow the gauges to be easily read by the operator.
10.12	Class 1 Pressure Gauges	There will be seven (7) individual pressure gauges installed on the pump panel. Each gauge will have dual readout capabilities, 0-400 PSI and 0-2800 kPa. The gauges will be approximately 2-1/2" in diameter.

10.13	Class 1 Flowminder (or Similar) Value System - Aerial Discharge	<p>The aerial discharge shall be equipped with a Class 1 Flowminder Value System or similar to give the pump operator or engineer an indication of actual volume of water (in gallons per minute) being discharged through the aerial waterway and the actual line pressure. The Flowminder or similar shall show total flow when a single "Total Flow" button is depressed and held.</p> <p>The Flowminder Value System shall consist of:</p> <p>A colour-coded bezel with digital display and mechanical pressure gauge on the pump panel. The flow display shall be weatherproof with super-bright digits at least ½" high. The pressure display shall be a 3-½" liquid filled, mechanical gauge with Sub Z freeze protection.</p> <p>A flow transmitter mounted in the discharge line piping between the pump and the discharge outlet. The transmitter is to consist of a weather resistant black composite housing with a stainless steel durable paddle wheel. The only part inserted into the water flow path shall be the paddle wheel.</p> <p>A set of connecting cables to connect the digital display to the flow transmitter and to the apparatus power.</p> <p>Machined mounting hardware to hold the transmitter in the correct position in the discharge line shall be provided and placed in strict accordance with the Class 1 mounting requirements as stated in the Operation and Instruction Manual.</p> <p>The flow meter shall be checked and calibrated prior to delivery of the apparatus.</p> <p>The pressure gauge shall be in PSI/KPA, and the aerial flowmeter shall be in GPM.</p>
10.14	Flow Meters	<p>There will be seven (7) flow meters. These flow meters will be on all discharges 2.5" and larger.</p>
10.15	Compound Pressure Gauges	<p>The two (2) master gauges shall be installed into a decorative chrome-plated zinc mounting bezel that also incorporates a test port manifold and a graphic overlay that identifies the master intake and discharge gauges, the vacuum test port, and the pressure test port. The test port manifold is solid cast brass with chrome-plated plugs.</p> <p>The gauge on the left shall be the master pump intake gauge and display a range from -30 to 400 PSI / -100 to 2750 kPa with black graphics on a white background. The gauge on the right shall be the master pump discharge gauge and display a range from 0 to 400 PSI / 0 to 2750 kPa with burgundy graphics on a white background.</p>
10.16	Pump Panel Speaker	<p>There shall be one (1) external weatherproof speaker, w/ on-off switch installed on the pump operator's panel. There is to be speaker wire run to the center dash access panel, with sufficient pigtail to attach to the customer radio.</p>
10.17	Air Horn Button On Pump Panel	<p>One (1) air horn button shall be provided on the pump panel.</p>

11.00	Pump Access Doors	
11.01	Instrument Panel	The surface above the control panel shall contain all instruments, gauges, test fittings, and optional controls. This surface shall be referred to as the "instrument panel". The instrument panel shall be independent and hinged and latched so that it may be opened. All instruments, gauges, and other equipment shall be installed with sufficient slack in any cabling, tubing, or plumbing to allow the panel to swivel to the fully open position.
11.02	Right Side Pump Access Door	There will be a treadbrite door above the right hand side pump panel to allow access to the pump compartment. The horizontally hinged panel will be of the single pan design and shall be positively latched in the closed position utilizing a pushbutton latch. A gas strut will be provided on the door with a mechanical drop down positive lock keeping the door open to a horizontal plain. This door will be wired into the hazard warning light circuit. An aluminum sill protector will be installed on the bottom of the door opening to protect the paint from chipping and scratching. Access Door is to be horizontally hinged.
11.03	Right side access door for Remote cab lift controller	As Crosslays #3 and #4 are to be connected to the right side pump panel discharge valves the hoses shall inhibit access to the remote cab lift. A additional treadbrite access door shall be outfitted to accommodate easy access to the cab lift remote without the need to disconnect these hoses.
11.04	Pump Access With Door	There will be a treadbrite access panel provided on the front of the pump compartment. The panel will be of the single pan design and shall be positively latched in the closed position. An aluminum sill protector will be installed on the bottom of the door opening to protect the paint from chipping and scratching.
11.05	Pump Compartment Lighting	There will be two (2) 4" LED lights installed in the pump compartment. The lights will be activated by an automatic switch in the right side pump compartment access door and will be located in a manner that will provide maximum lighting.

<u>VII - MAIN BODY</u>		
Index #	Item	Specification
1.00	General Body Construction	
1.01	General	The apparatus body will be designed to provide maximum storage of equipment and other accessories outlined in these specifications. All efforts will be made to avoid dead air space areas between compartments. If the method of manufacture must include air space voids, the areas will be adequately ventilated and drained, but not exposed to open weather.
1.02		The body and openings will be designed for rugged use and in a manner which will preclude cracking of welded joints.
1.03		The fabrication of the sheet metal for the body module will be by formed or bend and break construction using 3/16" 5052 aluminum plate. All bracket attachment points will be heavily reinforced.
1.04		Interior compartment dividing walls will not be less than 1/8" thick.

1.05		The interior of compartments will have a high adhesion grey polyurethane or similar coating applied for maximum protection of the body and equipment.
1.06		All seams in sheet metal below frame, and around the rear wheel well area to be welded continuous to prevent moisture from entering compartments. All other interior seams and corners to be sealed prior to painting.
1.07		Pop rivets" should not be used in any part of the apparatus.
1.08	Measurements	See Measurements section
1.09	Stepping, Standing, Walking Surfaces	All exterior surfaces designated by the manufacturer as stepping, standing, or walking areas will be constructed of aluminum or stainless steel, Grip Strut or Textured Treadbrite and will provide a highly slip resistant surface, even when the surface is wet. All interior surfaces designated by the manufacturer as stepping, standing, or walking areas will be slip resistant when the surface is dry. The degree of slip resistance will be in compliance with the intent of NFPA 1901 - latest edition. It is the desire of the fire department to purchase an apparatus that utilizes aluminum tread plate as an overlay of the main apparatus body structure. Aluminum tread plate may also be utilized in the construction of enclosure doors, lids and covers where applicable. Aluminum tread plate is not to be utilized as a main structural member of the apparatus body, compartments, or pump enclosure.
1.10	Tread plate Overlays	Horizontal walkways shall have aluminum tread plate overlays installed and vertical surfaces shall have aluminum overlays. Overlays shall be installed that are totally insulated from the apparatus with nylon shoulder washers that extend into holes in the body. Stainless steel cap nuts shall be employed where bolt ends may damage equipment or cause injury. After the apparatus is painted and the overlays are reinstalled, they shall be additionally sealed at the edges with a caulking compound. The exterior top tread plate overlay shall be mounted flush with the outer edges of the apparatus body. The following areas will have tread plate overlays installed: <ul style="list-style-type: none"> · All walkways and running boards. · The entire rear surface of the body. · Outside front faces of the side compartments. · The top surface of all side compartments, bending over the outside edge to form a drip rail.
1.11	Rear Wheel Wells	The fenders will be integral with the body sides and compartments with a seamless appearance. The fenders will be fitted with bolt-in removable full circular inner liners in the wheel well area for ease of cleaning and maintenance. There will be sufficient clearance provided in the wheel well to allow the use of tire chains when the apparatus fully loaded.
1.12	Rear Fenderettes	Polished stainless steel fenderettes shall be installed at each wheel well. The fenderettes shall be constructed of stainless steel that has been polished to a high quality finish.
1.13	Body Rub Rails	Rub rails will be installed beneath the compartment doors to protect them from damage should the body be brushed or rubbed against another object.
1.14	Rear Tow Eye	Minimum one (1) heavy duty rear tow eye will be installed directly below the rear of the chassis frame rails. The tow eye shall be capable of a straight pull rating without causing any damage to the body.

1.15	Handrails	<p>Handrails will be constructed of extruded aluminum of not less than 1-1/4" in diameter. All railing escutcheons and brackets will be chrome plated, and will be bolted to the body with stainless steel bolts. The lower bracket on all vertical handrails will have a drain hole drilled in it at the lowest point. Handrails will be provided in the following areas:</p> <ul style="list-style-type: none"> · Grab handle on top of catwalk on the left side of the apparatus in front of the tank fill tower · Grab handle on top of catwalk on the right side of the apparatus. · Vertical handrail on left back rear to access steps. · Horizontal handrail on left pump panel. · Horizontal handrail on right pump panel.
2.00 Body Mounting and Subframe		
2.01	General	The body module will be heavy duty, long life and be removable from the chassis frame for major repairs.
2.02		To assure proper body alignment and clearance the body sub frame will be either constructed or trued directly on the chassis. The body sub frame will be a one-piece structure designed to support the entire body in front, above, and behind the rear axle.
2.03		The body sub frame will be designed to provide a suitable support system and to prevent corrosion over a 20 year life. Preference for a body sub frame constructed from hot dipped galvanized steel tubing.
2.04		The main body sub frame shall be constructed from formed steel channel bolted and welded to the torque box. The sub frame shall be located at the front and rear of the body and in front of, above, and rear of the wheel well opening.
		The compartment area behind the rear axle shall be supported by a drop frame fabricated of steel tube and angles. All drop frame structures shall be welded directly to the torque box to allow the body to be a completely separate structure from the chassis.
2.05		The assembly design is to allow the body and sub frame to act as one (1) component, separate from the chassis. Body mountings that will not allow relief from chassis movement will not be acceptable.
2.06	Alternative	The body mounting specified is intended to provide information on what is currently used in operation, however, the final design requirements is ultimately the responsibility of the Contractor to meet operational and performance requirements.
2.07		Wood isolators are not acceptable to isolate the body frame members from direct contact with chassis frame rails.
3.00 Torque Box		
3.01		A mid mount "torsion box" subframe shall be installed on the chassis frame rails, integral with the stabilizers. The torque box and the turntable area which shall be constructed of "suitably sized" steel plate. The steel plates shall have a minimum yield strength of 100,000 psi. The torque box subframe assembly shall be capable of withstanding all torsional and horizontal loads when the apparatus is supported by the stabilizers. The torque box shall be bolted in place to the chassis frame rails using twenty-eight (48) 3/4" SAE grade 8 bolts with nuts.

3.02	Aerial Torque Box Paint	The aerial torque box shall be painted with PPG polyurethane enamel paint. The colour shall be (Black) PPG# MTK - 9000.
4.00	Stabilizers	
4.01	Front And Rear Stabilizers	<p>A minimum of two (2) sets of stabilizers shall be installed for stability. They shall be configured and placed to provide stability of the apparatus when the aerial is in use.</p> <p>The front stabilizers shall be located directly behind the chassis cab rear wall. The stabilizers shall be an integral part of the torque box, for maximum stability and to minimize the amount of loading being transferred to the chassis frame. A heavy-duty undersling assembly shall attach the front stabilizers to the front portion of the torque box. The undersling assembly shall be constructed of 3" x 6" x 1/4" square tubing, 1/4" & 3/8" steel gussets and 3/8" mounting plates. The overlap of the undersling and the torque box shall be a minimum of 24"</p> <p>The front stabilizers and torque box shall be attached to the truck frame in six (6) separate locations, three (3) each side of the apparatus, utilizing 3/8" steel plate. The mounting plates shall be located directly under the front stabilizers utilizing four (4) grade 8.625" bolts per side, under the front torque box area utilizing six (6) grade 8.625" bolts per side and at the rear stabilizer area utilizing four (4) grade 8.625" bolts per side.</p> <p>The rear stabilizers shall be double box tube design with jack cylinders that have a 4" internal diameter (bore) and a 2.5" diameter solid cylinder rod. The jack cylinders shall be equipped with integral holding valves which shall hold the cylinder either in the stowed position or the working position should a charged line be severed at any point within the hydraulic system.</p> <p>The steel used to build the stabilizer system shall have a minimum yield strength of 36,000 psi and ultimate tensile strength of 58,000 – 80,000 psi.</p> <p>Vertical jack cylinder rods shall be fully enclosed by a telescoping inner box to protect the cylinder rods, seal glands and pistons against damage from nicks, abrasion, and chrome damage. All vertical stabilizer cylinders shall be removable through the top of the box tube. Vertical stabilizers that require cylinders to be removed from the bottom shall not be acceptable. The inner double box system shall be further designed to stabilize the column load imparted upon the cylinder rod, thereby also protecting against damage which may occur from lateral loading which may be caused by side slopes, shifting or sliding of the apparatus on icy or unstable surfaces, sudden sinking of one or more jack pads, or on scene collision while the aerial device is deployed.</p> <p>Each extending style stabilizer shall have a polished stainless steel stabilizer cover. The cover shall be adjustable to allow for a proper fit.</p> <p>The stabilizers shall be connected to the hazard light circuit to warn the driver if they are not stowed when the parking brake is released.</p>
4.02	Stabilizer Stroke	The stroke of the stabilizer jack cylinders shall be a minimum of 22". The stabilizer pad shall be maintained at a stored height of approximately 12" to 15" (dependant on required ground clearance and angle of departure) resulting in a minimum ground penetration of 7" to 10" or greater.

4.03	Auxiliary Stabilizer Pads	An auxiliary pad for additional load distribution on soft surfaces shall be supplied for each stabilizer. The pads shall be constructed of ultra-high molecular weight composite material that is a minimum of 1" thick.
4.04	Stabilizer Extension System	Extension of the horizontal rear beams shall be activated by dual extension cylinders, which shall each have a 2" internal diameter (bore) and a 1.25" diameter cylinder rod. The extension cylinders shall be totally enclosed within the extension beams to prevent damage to the rod and hoses. The extension beams shall be 6.00" x 8.00" x .25" wall steel tubing with a steel plate welded to the top and bottom of each beam.
4.05	Fire Truck Leveling Stabilizer System	<p>The apparatus shall contain a Fire Truck Leveling (FTL) automatic stabilizer leveling system. The FTL automatic system shall provide an easy to operate push-button feature that enables the aerial operator the ability to quickly and efficiently setup the aerial stabilizer system. The FTL stabilizer system shall automatically level the apparatus, when setup on slopes within the defined parameters as defined by the Aerial Operations Manual, to within .2-degrees of level.</p> <p>In order to maximize safety as well as to allow the ability of "short-set" operations, the FTL shall be devoted to the down function of the stabilizer system. The extension/retraction functions are to be conducted manually.</p> <p>The controls and indicators shall be located at the rear control station, normally found at the rear center area of the apparatus. An LED indicator shall give the operator an actual, instantaneous visual indication of the level status of the apparatus.</p>
4.06	Mechanical Stabilizer Locks	<p>Each vertical jack cylinder shall be equipped with a mechanical pin lock to hold it in the working position. The pin shall be zinc plated and shall have a yellow dipped vinyl handle for increased visibility. The locking system shall be incorporated with the protective tubing used to prevent damage to the jack cylinder rod. The inner and outer jack tubes shall be double thickness in the pinning area for additional strength.</p> <p>Safety is of the utmost concern. It is the intent of the fire department to purchase an apparatus that utilizes mechanical stabilizer locks in addition to the hydraulic holding valves integral to the stabilizer jacks. Should a mechanical failure occur with the stabilizer system or hydraulic seepage cause a stabilizer to drift, the mechanical locks shall keep the desired "stabilizer set-up" in tact without compromising aerial capabilities or safety. There shall be no exception allowed to this requirement.</p>

4.07	Wear Pads/Bearing Surfaces	<p>Nylon wear pads impregnated with molybdenum disulfide and high in molecular weight shall be used between the stabilizer housing assembly and the extension tube for maximum smoothness of operation.</p> <p>Two (2) Nylatron wear pads shall be installed in each stabilizer extension system. There shall be one wear pad located on the top back portion of the extension tube assembly that shall glide on the inner wall of the top housing tube wall. There shall be an additional pad located on the inner wall of the bottom housing tube wall that shall separate the bottom side of the extension tube and the bottom wall of the housing tube. The pads shall be installed in such a manner as to reduce friction for ease of operation and to reduce the amount of metal-to-metal contact.</p> <p>Each stabilizer down-jack housing tube shall contain four wear pads, one (1) on each side of the tubes.</p>
4.08	Stabilizer Work Lights	<p>4" round clear LED floodlights shall be provided at each stabilizer location to illuminate the surrounding area. The lights shall be activated by the aerial master switch.</p>
4.09	Stabilizer Arm Warning Lights	<p>Two (2) Whelen model 5GR00FRR LED red flashing lights shall be mounted below each stabilizer beam, facing front and rear. These warning lights shall be activated by the aerial master switch.</p>
4.10	Stabilizer Cover Warning Lights	<p>There shall be one (1) Whelen model 60R00FRR LED-flashing light installed on each extending stabilizer cover panel. These lights shall be red in colour and activated by the aerial master switch.</p>
4.11	Electric / Hydraulic Stabilizer Controls	<p>The stabilizer controls shall be located at the rear of the apparatus. Two (2) stations shall be installed, one on each side at the rear, arranged so that the operator has full view of the stabilizer being positioned. All stabilizer control functions shall be of the electric paddle joystick style. The make and model of the joystick shall be the P-Q controls, model M105. The controls shall be designed to allow the stabilizers to be operated independently so that the vehicle may be set up in a restricted area or uneven terrain.</p> <p>An electrically actuated diverter valve shall be provided in conjunction with the stabilizer controls as a safety device. The diverter valve shall allow the hydraulic fluid to flow either to the stabilizer circuit or the turntable and ladder circuit, but not both simultaneously.</p> <p>A stabilizer deployment warning alarm, activated by the stabilizer mode, shall be provided at each stabilizer to warn personnel. The warning alarm shall deactivate only when all stabilizers are in the load supporting configuration, or when the diverter switch is no longer in the stabilizer mode.</p>
4.12	Air Horn Button In Rear Stabilizer Control Box	<p>One (1) air horn button shall be provided in the rear stabilizer control box.</p>

4.13	Hot Dip Galvanizing	<p>The extending stabilizer beams, inner jack tubes, and stabilizer pads shall be wheel-o-braided to remove any mill scale, or contamination prior to galvanizing.</p> <p>Following this preparation, the individual components shall be hot dip galvanized. The galvanizing process shall require that the entire assembly be completely submerged. Following the galvanizing process, the surface shall be ground smooth to remove dross. This preparation shall provide maximum protection for these critical components. No exceptions shall be allowed to this requirement due to stabilizers being exposed to salt spray and road debris.</p>
5.00 Compartments		
5.01	Compartments General	<p>All compartments shall be constructed to ensure the maximum usable space available is intended to be utilized while ensuring the smallest overall foot print of the vehicle. All considerations for service and maintenance must be considered for ease of access. Access panels shall be utilized for ease of maintenance and replacement of components.</p>
5.02	Roll Up doors	<p>All roll-up doors shall be preferred as Rom shutter type (or approved equivalent) with slats that roll onto a spool at the top of the compartment. They shall have a satin finish.</p>
5.03	Roll Up Door Handles	<p>The roll-up door will be supplied with a full width handle for ease of opening with only one hand, allowing quick access to equipment and nylon end shoes on every slat to assure operation without constant lubrication.</p>
5.04	Roll up door Locks	<p>There will be a power operated door lock provided on Rom roll-up type doors. A switch will be located in the chassis cab to lock and unlock all roll-up doors with power door locks. There will be a manual door lock with key provided.</p>
5.05	Sweep out construction	<p>Compartment floors will have a "sweep-out" design with door opening threshold positioned lower than compartment floor, permitting easy cleaning of compartments.</p>
5.06	Compartment Venting	<p>Each body compartment will be properly vented in a manner that will reduce the amount of dirt and water that may enter the compartment. Venting will be directly to the atmosphere rather than into another compartment, which would only spread moisture throughout the body rather than dissipate it.</p>
5.07	Compartment Drains	<p>Each compartment will be equipped duckbill style floor drains installed in the floor of each compartment. This style of drain is a one-way type drain to keep road grime from entering the compartment.</p>
5.08	Interlocking Tiles	<p>There will be interlocking dry-deck tiles provided with the apparatus and installed in compartments.</p>
5.09	Strut Channels	<p>All Shelving strut channels shall be galvanized and removable.</p>
5.10	Weatherproof Door Switches	<p>Due the harsh environment and susceptibility to moisture on the fire ground, the fire apparatus compartment doors will utilize weatherproof switches. Preferred switches will be weatherproof proximity switches where space permits. In tight locations, mechanical weatherproof switches will be used.</p> <p>The switches will be used for activation of the compartment lights and will provide a signal to the door open circuit in the cab.</p>

5.11	Shelving Channels	Allowance should be made for Strut channels to be installed in standard height compartment(s) for future shelves. Location of Struts will be finalized at the pre-construction meeting.
5.12	Adjustable Shelves	There shall be the ability to have adjustable in the side compartments. The adjustable shelves constructed of 3/16" aluminum sheet with 2" lips. The shelves shall be coated with a thermoplastic polyurethane coating. The shelves shall be fabricated in such a manner that liquids readily drain when spilled. Shelf location and layout will be discussed at the prebuild meeting.
5.13	Permanent Shelves	<p>There shall be two (2) permanent shelves installed on the apparatus. The shelves shall be constructed of heavy gauge aluminum sheet. The shelves shall be coated with a thermoplastic polyurethane coating. The shelves shall be designed in such a manner that will allow liquids to readily drain when spilled.</p> <p>The permanent shelves are to be located in L1 & R1 at the transition point.</p> <p>The permanent shelves shall have a lip on the outboard side to keep equipment from sliding against the door.</p>
5.14	Upper Body Storage Area	<p>There shall be a storage area above the body compartments and under the aerial ladder measuring approximately:</p> <ul style="list-style-type: none"> · 65" wide · 90" long · 9" high <p>A back heavy-duty vinyl tarp with elastic bungy cord through eyelets shall be provided to cover this area.</p>
5.15	Dunnage Compartment	A dunnage compartment shall be located above the pump module. The dunnage compartment floor shall be constructed of tread plate. The dunnage compartment shall have a hinged cover constructed from anti-slip tread plate material
6.00	L1 – Compartment	
6.01	L1 Compartment	<p>There shall be a full height compartment located ahead of the rear wheel on the left side of the apparatus body. This compartment shall be designated as L1 within these specifications and any ensuing paperwork or drawings after contract execution. It shall be equipped with a roll-up door. The dimensions of the compartment shall be:</p> <ul style="list-style-type: none"> • Height:- 24" • Width: 29" • Depth: 27" <p>Electrical load centre to be located here *</p>
6.02	Drip Pan	There shall be a drip pan with drain provided in the upper section of the compartment. The drip pan shall prevent moisture from the roll-up door spool from coming in contact with the breaker box.
7.00	L2 - Compartment	
7.01	L2 Compartment	<p>A compartment shall be located above the rear wheel on the left side of the apparatus body. This compartment shall be designated as L2 within these specifications and any ensuing paperwork or drawings after contract execution. It shall be equipped with a roll-up door.</p> <ul style="list-style-type: none"> • Height: 22" • Width: 84" • Depth: 27"

8.00	L3 - Compartment	
8.01	L3 - Compartment	<p>There shall be a full height compartment located behind the rear wheel on the left side of the apparatus body. This compartment shall be designated as L3 within these specifications and any ensuing paperwork or drawings after contract execution. It shall be equipped with a roll-up door.</p> <ul style="list-style-type: none"> • Height: 47" • Width: 41" • Depth: 27"
9.00	L4 - Compartment	
9.01	L4 - Compartment	<p>There should be a full height compartment behind the rear stabilizer. It should be equipped with a roll-up door.</p> <ul style="list-style-type: none"> • Height: 38" • Width: 18"
10.00	R1 - Compartment	
10.01	R1 Compartment	<p>There shall be a full height compartment located ahead of the stabilizer on the right side of the apparatus body. This compartment shall be designated as R1 within these specifications and any ensuing paperwork or drawings after contract execution. It shall be equipped with a roll-up door.</p> <ul style="list-style-type: none"> • Height: 28" • Width: 18" • Depth: 10"
11.00	R2 – Compartment	
11.01	R2 Compartment	<p>A compartment shall be located forward of the rear wheel on the right side of the apparatus body. This compartment shall be designated as R2 within these specifications and any ensuing paperwork or drawings after contract execution. It shall be equipped with a roll-up door.</p> <ul style="list-style-type: none"> • Height: 23" • Width: 29" • Depth: 27"
12.00	R3 - Compartment	
12.01	R3 Compartment	<p>A compartment shall be located above the rear wheel on the right side of the apparatus body. This compartment shall be designated as R3 within these specifications and any ensuing paperwork or drawings after contract execution. It shall be equipped with a roll-up door.</p> <ul style="list-style-type: none"> • Height: 17" • Width: 59 " • Depth: 16"
13.00	R4 - Compartment	
13.01	R4 Compartment	<p>There shall be a full height compartment located behind the rear wheel on the right side of the apparatus body. This compartment shall be designated as R4 within these specifications and any ensuing paperwork or drawings after contract execution. It shall be equipped with a roll-up door. One (1) aluminum adjustable full depth shelf shall be installed in the compartment. The shelf shall be constructed of 3/16" aluminum sheet with a minimum of 2" lips. The shelf shall have an abraded finish and shall be designed in such a manner as to allow liquids to readily drain.</p> <ul style="list-style-type: none"> • Height: 47" • Width: 42" • Depth: 14" Upper and 24" Lower

14.00	R5 Compartment	
14.01	R5 Compartment	<p>There shall be a full height compartment located behind the rear stabilizer on the right side of the apparatus body. This compartment shall be designated as R5 within these specifications and any ensuing paperwork or drawings after contract execution. It shall be equipped with a roll-up door.</p> <ul style="list-style-type: none"> • Height: 39" • Width: 18" • Depth: 27"
15.00	Rear Compartments	
15.01	Centre Compartment	<p>There shall be a centre compartment at the rear of the apparatus. The compartment shall be above the hose loader area. This compartment shall have a treadbrite horizontally hinged lift-up door. The compartment shall have a framework installed to divide area into three sections. There shall be pneumatic devices supplied to hold the door in the open position for access to the inside of the torque box. Compartment opening shall be approximately:</p> <ul style="list-style-type: none"> · 42" wide · 20" high
15.02	Two Side Compartments	<p>The ground ladders shall be stored within the torque box and two enclosed compartments, located between the torque box and the inside wall of the high side compartments. The ladders shall be removable from the rear of the apparatus. The ladders shall be enclosed so road dirt and debris cannot foul or damage the ladders. The ladders shall rest in full-length slides and shall be arranged so they can be removed individually. The apparatus shall be designed to accommodate the NFPA Pamphlet 1901 (latest revision) ladder load.</p> <p>There shall be two openings, one either side of Centre compartment for the storage of ladders and pike poles. The compartment openings shall be approximately:</p> <ul style="list-style-type: none"> · 11" wide · 28" high · 186" long
16.00	Ladder	
16.01	Description	<p>Ladders shall be provided by the apparatus manufacturer and shall comply with NFPA Pamphlet 1931. The following ladders shall be supplied with the apparatus at the time of delivery:</p> <p>One (1) 10' folding attic ladder(s), Duo Safety 585A One (1) 14' Fresno ladder(s), Duo Safety 701 One (1) 16' roof ladder(s), Duo Safety 875A One (1) 24' Two section extension ladder(s), Duo Safety 900A One (1) 35' Three section extension ladder(s), Duo Safety 1225A</p>
16.02	Ladder Rack - Pike Pole Storage	<p>Pike poles shall be stored near the ground ladders. Provisions shall be made to ensure the pike pole storage does not interfere with hose deployment.</p> <p>The following fiberglass handled pike poles shall be supplied with the apparatus at the time of delivery:</p> <p>Two (2) 4' D-Handle Fiberglass Pike Pole(s), Duo Safety FP4D Two (2) 6' Wood Pike Pole(s), Duo Safety WP6 Two (2) 8' Wood Pike Pole(s), Duo Safety WP8 Two (2) 12' Wood Pike Pole(s), Duo Safety WP12</p>

17.00	NFPA Step Requirements	
17.01	General	<p>All steps will have a surface area of at least 35 square inches and will be able to withstand a load of at least 500 pounds. Steps will be provided at any area that personnel may need to climb and will be adequately lighted. Each folding step will have two large open slots to prevent buildup of ice or mud and to provide a handhold when necessary. These folding steps are to be of a ball-burnished finished to prevent any finish from flaking off.</p>
17.02	Step Locations	<p>Steps will be provided in the following locations (please confirm style and make) Please ensure they do not interfere with any pump connections:</p> <p>Three (3) folding steps on the left front compartment</p> <p>Three (3) folding steps on the right front compartment</p> <p>In addition there shall be one (1) folding steps on the outside face of each front Stabilizer housing to assist in accessing the Crosslay hose beds</p> <p>NOTE: The exact number of steps provided may vary depending upon body configuration and options.</p> <p>The folding step on the outside face of each front stabilizer shall be approximately 19-1/2" above the rub rail.</p>
18.00	Rear Tail Board / Bumper	
18.01	Modular Rear Tail Board	<p>A modular bolt-on tail board will be installed on the rear of the apparatus to form a step area. The rear tail board will be constructed of non-slip treadbrite. The recessed rear tail board will be installed between the left and right side body, below the rear compartments. The tail board depth shall be determined by the overhang dimensions for the vehicle and the depth of the Rear compartment. minimum usable surface depth shall be 8".</p> <p>All running boards and rear tail board will be installed with sufficient support to form a sturdy, non-deflecting step area for personnel.</p>
18.02	Rear Bumper Modular Corners	<p>Rear Bumper Corners Shall be replaceable in sections of Left side and Right side pieces on either sides of the Rear Tail Board</p>
18.03	Hose Webbing	<p>There will be a heavy duty 1" x 1" black nylon webbing installed on the rear of the apparatus. The sides and bottom of the webbing shall be attached by D-rings and hook fasteners. Or Surrey approved equal.</p> <p>The final configuration and fastening design shall require approval.</p>
18.04	Rear Step Signal System	<p>A rear step buzzer system will be installed. It will consist of two (2) weather proof buttons at the rear step area, one each side, with a label reading "1-STOP, 2-GO, 3-BACK UP", and a buzzer in the cab that is activated by the rear step switch.</p>

19.00	Main Hose bed	
19.01	Hose Bed	The hose bed will be located ahead of the ladder turntable.
		There will be a hose chute to the side and rear of the hose bed on the right side to allow for the removal of the hose.
		Hose capacity will be a minimum of 1,000 feet of 4.00" large diameter hose.
		The hose bed will be fabricated of 5052-H32 aluminum with a tensile strength range of approx. 31,000 psi. The upper and rear edges of the hose bed side panels will have a double break for rigidity. The hose bed flooring will consist of removable aluminum grating with a top surface that is perforated to aid in hose aeration.
		The hose bed should be cover with a suitable vinyl cover and secured at four sides.
20.00	Air Bottle Compartments	
20.01	Air Bottle Compartments	There shall be eight (8) single cylinder air bottle compartments installed in the rear wheel well area. The tubes shall be constructed from injection-molded plastic to reduce damage to the air cylinders. There shall be a drain hole in the rear of the compartment.
20.02	Air Bottle Compartment Doors (O-Ring Gaskets)	The dual air bottle compartment will have a stainless steel hinged door with an O-ring gasket This needs to stay
21.00	Fuel Fill Access	
21.03	Fuel Fill	There will be a fuel fill pocket located on the right side (or if possible fill port on both sides) just behind the rear wheel well area. The fuel fill will have a Cast Products (or equivalent) aluminum door with bezel installed.
21.04	Fuel Tank Access Panel	There will be a removable panel provided in the rear compartment to allow for access to the fuel tank sending unit without removing the fuel tank.

VIII - LIGHTING SYSTEMS		
Index #	Item	Specification
1.00	Vehicle Lighting	
1.01	Clearance / Marker Lighting	LED clearance lights will be installed on the Cab and Body as necessary to be in full compliance with applicable SAE, ICC and FMVSS/CMVSS codes and regulations.
1.02	Rear Clearance / Marker Lighting	2" round LED clearance lights will be installed on the rear of the body as necessary to be in full compliance with applicable SAE, ICC and FMVSS/CMVSS codes and regulations.
1.03	Headlights	Preferred for Apparatus to have four (4) rectangular LED headlamps with a separate high and low beams in bright bezels shall be provided above the inboard warning lights.

1.04	Headlight and Marker light activation	The headlights and marker lights shall be controlled via a virtual button on the Multiplex display. There shall be a virtual dimmer control on the Multiplex display to adjust the brightness of the dash lights. The headlamps shall be equipped with the "Daytime Running" light feature, which shall illuminate the headlights when the battery master switch is in the "On" position and the parking brake is released.
1.05	Alternating Headlights	An alternating high beam headlamp flashing system shall be installed into the high beam headlamp system that will allow the high beams to flash alternately from left to right. The completed system shall be capable of using high beam to override flashing function and will flash high beams only when the low beam headlamps are selected.
1.06	Turn Signals - Front Cab Forward facing	Two (2) 6"x4" Amber "Arrow" LED programmable turn signals shall be installed in polished aluminum castings above the outer warning / headlamps lamps.
1.07	Turn Signals - Front Cab Corners	Two (2) round side turn signal/marker lights shall be provided on the front cab corners.
1.08	Cornering Lamps	Two (2) Whelen model 500 LED or equivalent steady-on cornering lamps with clear lenses shall be provided to illuminate the area adjacent to the front corner of cab when the turn signal switch is activated
1.09	Turn Signals - Mid Ship	There will be one (1) Truck-Lite model 21LED (or equivalent) midship auxiliary / turn signal lights installed in the rub rail, on each side of the body. Or City approved equal.
1.10	Midship Turn Signal	There shall be one (1) Whelen model 700 LED (or equivalent) turn signal lights, part number 70A00AAR with chrome flange, installed in the rear wheel well area, on each side of the body.
1.11	Rear Tail - Turn - Stop - Emergency Lighting assembly.	The preference will be for Whelen 600 series (6x4) lighting (or equivalent), to be installed. The lights will be mounted in the cast housing, on each side of the apparatus.
1.12	Cab LED Ground Lighting	The cab shall be equipped with 4" round LED ground lighting under each cab door. The lights will be activated by either a single switch on the Multiplex display or each respective door switch, as well all ground light will activate with park brake application.
1.13	Cab Step Lighting	4" round LED lights will be installed within the Cab step wells where personnel may be expected to climb on and off of the apparatus.
1.14	LED Ground Lighting	4" round LED lights will be installed beneath the apparatus in areas where personnel may be expected to climb on and off of the apparatus. The lights will illuminate the ground within 30" of the apparatus to provide visibility of any obstructions or hazards. These areas will include, but not be limited to, cab doors, side running boards, and the rear step area.
1.15	Walkway lighting	Peterson 397C LED (or equivalent) lights will be mounted in a manner that illuminates all walkways and steps for safe operation of the apparatus. These lights will become illuminated when the parking brake is engaged.

1.16	Cab Interior Lighting	<p>The cab interior lighting shall consist of the following:</p> <p>A red/white dome lamp shall be located over each door. The white lamp shall be activated by its respective door when opened and both activated by an individual switch on the light.</p> <p>A red/white dome lamp with individual switches shall be located in the headliner, over the engine tunnel to serve as a tunnel surface light.</p> <p>These lights shall be LED.</p>
1.17	Map Light	A Sunnex (or equivalent) instrument panel map light shall be installed on the right hand side (Officer's side) of the overhead HVAC consul.
1.18	Hand held spot light	Shall supply (1) Brinkmann 800-2301-0 Q-Beam Max Million III (or equivalent) Spotlight.
1.19	Door Panel Red Warning lights	Each panel will have a flashing warning red 4" round LED light installed in each inner door panel.
1.20	Flashing Door ajar Light	A red flashing door ajar light shall be located in the headliner, centered in the cab. The light shall be labeled " Do Not Move Apparatus ". The light shall be wired to indicate an open door on the cab when the parking brake is released.
1.21	Engine Tunnel Work lighting	A clear 4" round LED work light shall be provided and installed under the engine tunnel.
2.00	Compartment Lighting	
2.01	Compartment Lighting Activation	An automatic door switch will activate these compartment lights.
2.02	Roll up Door Compartment Lighting	LED light strips shall be used on either side of the compartment opening illuminating the entire compartment from bottom to top. These light strips shall be mounted and protected at or near the channels of the doors.
2.04	Hatch Compartment Lighting	There shall be LED lighting illuminating the compartment once opened. The light shall be directed into the compartment when the door is opened
2.05	Pump Compartment Lighting	There will be two (2) 4" LED lights installed in the pump compartment. The lights will be activated by an automatic switch in the right side pump compartment access door and will be located in a manner that will provide maximum lighting.
3.00	Warning Lighting	
3.01	General	The apparatus warning lights shall meet the following SAE standards J595 / J845 / J1849 / J578 / J575 / J2498 as required. Inclusive of the NFPA 1901 - latest edition
3.02	Inboard Front warning lights	There shall be Four (4) Red 6"x4" LED warning lights shall be installed on the cab fascia below the headlamps in a chrome housing.

3.03	Upper Zone A Light bar	There shall be one (1) - 72 - 74" LED light bar installed on the chassis cab roof. The light bar shall be equipped dual light configuration of RED WHITE flashing forward facing lights. On the outside left and right locations there shall be LED rotating beacon style lights that can be programmed to rotate to the outer side and change to white colour to act as a ALLEY Light on demand. All forward facing lights shall have a RED flash with park brake applied and an alternating RED WHITE with park brake released. An override shall be provided for the front facing WHITE lights to act as a FRONT SCENE light activated by a separate switch through the multiplex display. All lens covers on light bar shall be clear. Programming and flash patters are to be finalized at the pre-production meeting.
3.04	Lower Zone B Warning Lights	There will be three (3) Red 6"x4" LED lights with flanges installed in the lower warning zone. The lights will have red replaceable lenses. One at the front bumper area, one at the middle of the cab, one at the rear wheel area.
3.05	Upper Zone C Rotating Lights	There shall be two (2) LED rotating beacons installed high at the rear of the apparatus. The lights shall have red lenses. Preference to Federal Signal SLR (or equivalent). The left beacon shall rotate at 120 RPM and the right beacon shall rotate at 90 RPM.
3.06	Upper Zone C Amber Warning lights	There will be two (2) 6"x4" Amber LED lights with flanges installed in the upper warning zone. The lights will have amber replaceable lenses. *Locate above the 900 Series scene lights.
3.07	Lower Zone D Warning Lights	There will be three (3) Red 6"x4" LED lights with flanges installed in the lower warning zone. The lights will have red replaceable lenses. One at the front bumper area, one at the middle of the cab, one at the rear wheel area.
3.08	Grille Strobe Light LED	There will be one (1) White with clear lens 7"x3" LED light installed on the front of the cab. The LED light will be wired in such a manner as to be disabled when the parking brake is set. Locate either on or above the front grille.
3.09	Opticom	Opticom™ Model 794H LED Emitter (or equivalent): High-priority emitter. The emitter shall be wired in such a manner as to be disabled when the park brake is set. A switch in the main switch panel shall control the unit in conjunction with the park brake circuit.
3.10	Opticom Mounting	The lightbar shall include an Opticom mounted off center to the left in the front of the light bar. The cable shall exit the lightbar on the right side of the cab.
3.11	Directional Lighting LED - Option 1	There shall be one (1) Federal Signal 42", 8-head VPX Signal Master c/w Federal Signal SignalMaster Controller SMC1 (or equivalent). This light assembly is to be mounted above the rear tailboard compartment and below cribbing storage compartment, housed in a custom built step / handle that will run across the back of the tail board body. The controller is to be flush mounted in the dash. Exact mounting and location for both are to be decided at the pre-production meeting.
3.12	Directional Lighting LED - Option 2	Please note option 2 in the "Additional Options" tab for Directional Lighting LED

4.00	Scene Lighting	
4.01	Cab - Side Scene Lighting	Two (2) White with Clear lens 9"x7" LED scene lights shall be installed on the sides of the cab. The lights shall be surface mounted one (1) each side of the cab. The lights shall be controlled by separate switches one (1) for the left side and one (1) for the right side, and when a cab door is opened on the associated side is opened.
4.02	Fire Body - Side Scene Lighting	<p>There will be five (5) 7"x3" LED Scene lights with gradient 8-32 degree optics installed on the apparatus.</p> <p>One (1) light shall be located on the upper rear center face of cab for the illumination of the Crosslay Hose Beds & Dunnage area. This light shall be switched by the Multiplex system and shall be one of the earliest lights to shed through the Multiplex system. Shedding point to be determined at pre-production.</p> <p>Locate two (2) scene lights on the left side of the body, (1) to the front and (1) toward the back.</p> <p>Locate (2) scene lights on the right side of the body, (1) to the front and (1) toward the back.</p> <p>These lights shall be switched by the Multiplex system and when a cab door on the corresponding side is open.</p>
4.03	Forward facing Scene Lighting	Forward Facing Scene lighting shall utilize the Apparatus Light bars forward facing white lighting in an override state to provide front scene lighting. This option shall be switchable through the Multiplex system and functional with the Park brake in both the on and off position.
4.04	Rear Facing Scene Lighting	<p>There will be two (2) 9"x7" LED Scene lights with internal and external optic design for superior scene-lighting without angle brackets installed on the apparatus.</p> <p>The lights shall be located at the upper rear of the apparatus (1) each side.</p> <p>The rear scene lights will be controlled by the Multiplex system in the cab, rear work light switch, and when the transmission is placed in reverse.</p>
4.05	Rear Facing Scene lighting - switching	<p>There will be a switch at the rear of the apparatus to activate the backup lights and rear scene lights when the parking brake is set. This switching circuit shall be deactivated when the parking brake is released.</p> <p>There will shall also be a switch provided in the cab to activate the backup/scene lights when the parking brake is set. This switching circuit shall be deactivated when the parking brake is released.</p> <p>In addition to the lights being activated by the above switches, the lights will also come on when the transmission if placed in reverse.</p>
4.06	Stabilizer Work Lights	Four (4) Truck-Lite LED clear floodlights one shall be provided at each stabilizer location to illuminate the surrounding area. The lights shall be located under the stabilizer beams and activated by the aerial master switch

4.07	Turntable tracking Work Lighting	<p>The turntable shall be lighted for nighttime operation with a minimum of three (3) LED work lights, which shall be automatically activated by the aerial master switch (day or night). The work lights shall be so positioned that the light shall be directed toward the decking. The lights shall have integral chrome hoods to keep light from glaring upward into the operator's eyes.</p> <p>An additional light shall be recess mounted in the front access door of the control stand.</p>
4.08	Aerial Spotlights	<p>Two (2) LED 12volt work lights which produce 3,600 lumens. 12volt combination spot / flood lights shall be furnished. The "tracking" lights shall be mounted under the base section of the ladder. The lights shall be switched by a switch on each light head, and from the operator control station at the base of the ladder.</p>
4.09	Aerial Spotlights	<p>The rectangular extruded light fixture with die cast end caps with a light fixture shall have a single panel of (2) horizontal clusters of LED lamps with a molded vacuum metalized reflector that draws 6 amps at 12 Volts. The light shall be mounted with an aluminum adapter plate attached to the pole with an On-Off toggle switch, switch box and a locking swivel joint with a 3/4" diameter NPT threaded base to allow the light to be manually tilted up/down and locked in position by the operator. There shall be a removable handle standard on the light-head. The light shall have the Whelen HDP Heavy-Duty Professional five year warranty.</p> <p>The light shall be complete with one (1) Whelen pedestal mount. Lights to be mounted at the rear of the appliance above the rear compartments.</p>
4.10	Platform Deck lighting	<p>Optronics mini LED lights shall be installed for platform deck working lights. The lights shall provide adequate lighting within the platform to illuminate the entire floor area during nighttime operations. The lights shall be hooded to direct all light downward and shall automatically energize anytime the aerial system is activated. The lights shall be installed inside of the platform in such a manner to prevent damage during operation by moving or shifting equipment in the platform.</p>
4.11	Platform Warning Lights	<p>Four (4) Whelen 700 Series Super-LED lights shall be installed on the platform. The LED lights shall be installed one on each side of the platform and two on the front of the platform. The LED lights shall be red in colour and flash any time the emergency master has been activated, but off when the aerial diverter valve is activated. All LED lights shall be wired through the aerial device swivel.</p>
4.12	LED Lights At Aerial Tip	<p>Two (2) Unity LED 12-volt combination spot/flood lights shall be installed at the tip of the aerial. Each light shall be capable of 1,800 LUMENS and 50,000-hour lamp life. Each light shall have a water resistant on-off toggle switch located on the main housing. The lights shall be located on the front of the aerial platform, one (1) driver's side and one (1) officer's side of center. The tip light(s) shall be controlled by a toggle switch located on the turntable control console.</p>
4.13	Aerial Mounted 120-Volt Receptacle	<p>There shall be one (1) 120 Volt receptacle mounted on the end of the fly section. The receptacle shall be wired through the electrical swivel, and shall be controlled from the breaker box located in the body.</p> <p>The receptacle shall be a duplex 3-wire straight blade, household type receptacle, 5-20, 120Volts, 20 Amp, with a spring-loaded weather resistant cover. A load center shall be installed on the rear face of the platform with breakers for each 120V component located on the platform.</p>

4.14	12-Volt Receptacles At Ladder Tip	There shall be one (1) 12 volt receptacles provided at the ladder tip.
5.00	Lighting Preferred Packages	Below are the preferred lighting packages or a Surrey Approved Equivalent.
5.01	72"-74" Light Bar	Federal Signal Navigator LED light bar with outside SLR rotators and internal Quadra Flare warning lights. (or approved equivalent)
5.02	6"x4" Red Warning Lights	Federal Signal Quadra Flare LED lighting with replaceable lenses. (or approved equivalent)
5.03	6"x4" Turn Signals	Federal Signal Quadra Flare "Arrow" LED lighting with replaceable lenses. (or approved equivalent)
5.04	7"x3" Front Intersection grill light	Federal Signal Quadra Flare LED lighting with replaceable lenses. (or approved equivalent)
5.05	7"x3" Scene Lighting	Whelen 700 Series Super-LED Light heads (or approved equivalent)
5.06	9"x7" Scene Lighting	Whelen 900 Series Super-LED Light heads. (or approved equivalent)
5.07	4" Round lighting	All 4" lighting shall be Truck-lite 44 Series LED Lighting (or approved equivalent)
5.08	Compartment and Panel Strip lighting	On-Scene Solution LED Night Axe (or approved equivalent)

IX - ELECTRICAL SYSTEMS		
Index #	Item	Specification
1.00	12 volt system	
1.01	12 Volt Wiring	All wiring must be concealed or out of weather and harm's way but must be accessible to any junctions, relays, end points, Harnesses etc. All wiring connectors must be assembled with dielectric grease. All 12 volt wiring will be done in accordance with the requirements of NFPA 1901 - Latest edition.
1.02	12-Volt System Schematic	A complete electrical schematic for the apparatus shall be provided. This schematic shall be specifically prepared for this individual unit rather than a generic schematic designed to accommodate all apparatus.
1.03	Amp Load Analysis	The entire 12V electrical system will have an "Amperage Load Analysis" completed on the apparatus prior to delivery. A copy of the analysis will be supplied with the apparatus at the time of delivery. At the time of delivery a detailed electrical schematic will be furnished. It will be supplied on a full size print for easy review.
1.04	12 Volt Systems Test	After completion of the unit, the 12 volt electrical system will undergo a battery of tests as listed in the latest addition of NFPA 1901. These tests will include, but not be limited to: a reserve capacity test, alternator performance test at idle, alternator performance test at full load, and a low voltage alarm test. Certification of the results will be supplied with the apparatus at the time of delivery.

1.05	Circuit Protection	Circuit protection devices, which conform to SAE standard, will be utilized to protect each circuit and will be readily accessible. All circuit protection devices will be sized to prevent wire and component damage when subjected to extreme current overload. General protection circuit breakers will be Type-I automatic reset (continuously resetting) or Type-II (manual resetting) and conform to SAE J553 or J258. When required, automotive type fuses conforming to SAE J554, J1284, J1888 or J2077 will be utilized to protect electronic equipment.
1.06	Circuits	All circuits will be protected against corrosion, excessive heat, excessive vibration, physical damage and water spray. Any circuit, which draws 15 amperes or more, be switched through relays. At any place where the harness or sub-harness passes through metal, heavy grommets will be installed.
1.07	Harnesses	Harnesses will be modular in design for ease of repair and maintenance. All wire harnesses will be easily accessible and replaceable. The wire will be individually colour coded and will be labeled as to its function on the insulation. All wire connections will be protected with a marine "soft seal" to promote a lasting corrosion free connection. All connectors will be weather resistant and connected with high quality components.
1.08	Large Harnesses	Large harnesses will include spare wires.
1.09	Large Harness Connectors	Large harness connectors will be the Deutsche series or similar quality, with sealing plugs for any sockets not containing a wire.
1.10	Switches	Light switches will be of the rocker type with an integral indicator light that will show when the lights are energized. All switches will be appropriately identified.
1.11	Relays and Breakers	All relays and circuit breakers will be clearly labelled.
1.12	Remote Throttle Harness	An apparatus interface wiring harness for the engine and transmission pump interlocks shall be supplied with the chassis. The harness shall include a connector for connection to a chassis pump panel harness supplied by the body builder and shall terminate in the left frame rail behind the cab for connection by the body builder. Separate circuits are also included for engine oil pressure warning light, engine coolant temperature warning light, low fuel light, check engine light, stop engine light, high idle switch and high idle indicator light.
2.00	Cab Accessory Power	The electrical distribution panel to be designed to accommodate all communication equipment power requirements as listed and other accessories.
2.01	12 Volt ATC/ATO fuse panels	Three (3) Blue Sea, 6 circuit ATO/ATC fuse blocks c/w cover and negative bus, shall be provided and installed within an electrical distribution location in the dash. Operating amperage per block shall be 100 amps. <ul style="list-style-type: none"> • One block to be Master switched power • One block to be battery direct • One block to be Ignition switched power
2.02	Dual USB Port	A dual USB charging port will be provided around the center of the front dash between the driver and the officer for the charging of electronics such as laptops and tablets.

2.03	Power And Ground Studs - Battery Direct	<p>Power and grounding studs shall be provided and installed behind the electrical center cover with a breaker. The studs shall be #10 and capable of carrying up to a 40 amp battery direct load.</p> <p>The power and ground studs are to have two (2) switched on with ignition and two (2) battery direct (hot).</p>
3.00	Batteries	
3.01		Shall meet all requirements as outlined within the NFPA 1901 - latest edition
3.02		Shall meet all requirements as outlined within the ULC S515 - latest edition.
3.03		Preferred batteries will be Group 31-950 CCA Absorbed Glass Mat style, exceeding the minimum CCA recommendations of the engine manufacturer
3.04		The batteries shall be readily accessible for examination, testing, maintenance and replacement.
3.05	Battery Jumper studs	There shall be battery jumper studs provided, with covers, and located in the drivers step area. These studs shall allow for the apparatus to be jump started in the event of battery failure. (exact location to be determined at Pre production meeting)
4.00	Battery Conditioner	
4.01	Shore Power Inlet	A 20 amp male electrical receptacle with a gray weatherproof cover and box. This shore power inlet is to be located in the driver's step area.
4.02	Battery Conditioner	A Kussmaul Auto Charge 40 LPC battery conditioner shall be supplied. The battery conditioner shall provide a 40 amp output for the chassis batteries and a 15 amp output circuit for accessory loads. The battery conditioner shall be mounted in the cab in the LH rear facing outer seating position
4.03	Remote Charge Status Center	The remote charge status Info center display will be viewable through the driver's side center crew cab window.
5.00	Multiplex System	
5.01	Preferred	<p>Preference is for the apparatus to be equipped with a V-MUX Multiplex System (or equivalent). There are several key benefits to multiplexing, one is to reduce the number of connections in a vehicles electrical system, because of this it is important to limit the amount of modules and wiring that control certain functions of the vehicle, therefore wherever it is stated that an "add-on" module will not be acceptable and it shall be built as a multiplexed apparatus. in addition the current fleet uses this system.</p> <p>Preference for the latest model of Weldon V-Mux Multiplex System (or equivalent).</p> <p>The Multiplex system shall be able to perform in extreme temperature conditions, from 40° to +85° C (40° to +185° F.) The system shall be sealed against the environment, moisture, humidity, salt or fluids such as diesel fuel, motor oil or brake fluid. The enclosures shall be rugged to withstand being mounted in various locations or compartments around the vehicle. The modules shall be protected from over voltage and reverse polarity.</p>
5.02	Alternative	The Multiplex system specified is intended to provide information on what is currently used in operation, however, the final design requirements is ultimately the responsibility of the Contractor to meet operational and performance requirements.

5.03		Apparatus shall be equipped with a multiplex electrical management system
5.04		Shall be a peer - peer system
5.05		There shall be 2 displays, one for the driver and the other for the officer
5.06	Drivers Display	Shall have all required functions available
5.07	Officer Display	The Officer's display will only control the HVAC, emergency lighting, scene lighting, alley lighting, dome lighting, ground lighting, occupant info, open door detail, time & date adjust.
5.08	Load Shedding	Load Shedding: The System shall have the capability to Load Shed with 8 levels any output. This means you can specify which outputs (barring NFPA restrictions) you would like Load Shed. Level 1 12.9v, Level 2 12.5V, Level 3 12.1V, Level 4 11.7V, Level 5 11.3V, Level 6 10.9V,
		Level 7 10.5, Level 8 10.1. Unlike conventional load shedding devices you can assign a level to any or all outputs. No addon modules shall be acceptable; the module with the outputs must perform this function.
5.09		Load Sequencing: The System shall be able to sequence from 0 8 levels any output. With 0 being no delay and 1 being a 1second delay, 2 being a 2second delay and so on. Sequencing reduces the amount of voltage spikes and drops on your vehicle and can help limit damage to your charging system. No addon modules shall be acceptable; the module with the outputs must perform this function.
5.10	Outputs:	Output Device: The System shall have solid-state output devices. Each solid-state output shall be a MOSFET (Metal Oxide Semiconductor Field Effect Transistors); MOSFETs are solid-state devices with no moving parts to wear out. A typical relay, when loaded to spec, has a life of 100,000 cycles. The life of a FET is more than 100 times that of a relay. No addon
		Modules shall be acceptable; the module with the outputs must perform this function.
5.11		Flashing Outputs: The System shall be able to flash any output in either A or B phase, and logic is used to shut down needed outputs in park or any one of several combined interlocks. The flash rate can be selected at either 80, or 160 FPM. This means any light can be specified with a multiplex truck with no need to add flashers. Flashing outputs can also be used to warn of problems. No addon modules shall be acceptable; the module with the outputs must perform this function.
5.12		PWM: The modules shall have the ability to PWM at some outputs so that a Headlight PWM module is not needed. No addon modules shall be acceptable; the module with the outputs must perform this function.
5.13		Diagnostics: An output shall be able to detect either a short or open circuit.
5.14	Inputs	The inputs shall have the ability to be switched by a ground or battery signal. The inputs shall be filtered for noise suppression via hardware and software so that RF or dirty power will not trick an input into changing its status.

5.15	Automatic Climate Control:	The Multiplex system shall have the capability to provide automatic climate control, this shall occur by the use of PWM outputs and a Digital readout that combines other vehicle functions as well. The Climate control shall be an integral part of the Multiplex system. No add-on modules shall be acceptable; the module with the outputs must perform this function.
5.16		Shall have output controls on interlock systems
5.17		Shall provide controls for HVAC system
5.18		Shall have the capability for automatic climate control
5.19		Shall provide controls for emergency lighting
5.20		Shall be capable to communicate with the engine ecm and provide automatic high idle function as battery voltage requires.
5.21		Shall be able to show diagnostic code warning information from engine ECM.
5.22		Shall provide controls for Scene lighting with independent switching for Left side Scene, Right Side Scene, Front Scene, Rear Scene, Hose bed / Cross lay
5.23		Shall be a sealed system against the environment, moisture, humidity, salt or fluids such as diesel fuel, motor oil or hydraulic fluid.
5.24		Shall be able to flash any output in either an A or B phase and use a logic signal to shut down needed outputs when in park, or any one of several combined interlocks.
5.25		Shall provide door open detail showing a diagram of 3 sides of the apparatus alerting which doors are open visually and in written dialogue on the screen.
5.26		Shall have self diagnostics and communicate to perform diagnostics on all outputs of the multiplex system on the apparatus
5.27		Shall be able to provide real time information regarding Load shedding, system status, wiring shorts, wiring opens, network failures.
5.28		Shall be able to store faults occurring in the system for future diagnostics and repairs
5.29	Auto Throttle	The Multiplex system will be able to perform automatic high idle via a network gateway or by using an existing output on a module to provide the proper signals to an OEM engine ECU. This task will be handled with existing inputs and outputs.
5.30	Inputs	1. The inputs will have the ability to switch by a ground or battery signal. 2. The inputs will be filtered for noise suppression via hardware and software so that RF or dirty power will not trick an input into changing its status.

5.31	Audible Alarm for Open Door Light	An audible alarm shall be wired to the open door light, which will sound when a door is open and the park brake is off with the vehicle in gear. This shall include the ability to safely override the alarm (if malfunction occurs in the system) and yet reset once power is disrupted.
5.32	Data recording device	The chassis shall have a Vehicle Data Recorder (VDR) system installed. The system shall be designed to meet NFPA 1901- latest edition and shall be integrated with the Multiplex electrical system.
5.33	Reverse Camera(s)	Reverse camera(s) will be installed, and the V-Mux display screens shall be video ready for back-up cameras, thermal cameras, and DVD. Please provide options.
6.00	120 volt / 240 volt GFI System	
6.01		The entire 120/240-volt electrical system will be installed in compliance with the requirements of NFPA 1901 - latest edition. This will include all testing, labelling, wiring methodology, and dimensional requirements. Certification of compliance will accompany the apparatus at the time of delivery.
6.02		There will be a 120/240-volt load centre incorporated into the 120/240 volt wiring system. The load centre will include adequate circuit breakers to protect the loads specified for this apparatus. All 120/240 volt AC wiring will be done in accordance with the requirements of NFPA 1901 - latest edition, CSA and National Electrical Code. Circuit panel to be easily accessible.
6.03	Location of Load centre	The 120/240V circuit panel to be located in compartment L1.
6.04	Branch Circuit Overcurrent Protection	Overcurrent protection devices will be provided for circuits in accordance with NFPA 1901 newest version. The load center will be equipped with a non-GFI two pole main breaker when the six or more individual branch circuits are present. Overcurrent protection devices will be marked with labels to identify the function of the circuit they protect.
7.00	R4 - Compartment Electrical Distribution	
7.01	General	The Compartment will house an electrical cord reel with 200" of Cord terminating with a 4 gang outlet box. As well as have a Dual receptacle outlet internal to the compartment with a 6-8 outlet GFI Power bar. There shall also be 12 volt positive and ground posts for wiring additional accessories as required.
7.02	Dual receptacle outlet	A 20 amp dual receptacle outlet shall be internally mounted on the forward left side wall. This outlet shall be come powered with generator power as well as with shore power.
7.03	Cord Reel	There will be one (1) Hannay model ECR1616-17-18 (or equivalent) 120 volt electric rewind cord reel installed on the apparatus with a push button labeled REEL REWIND installed for 12 volt rewinding of each cord reel. The reel will be equipped with 200' of yellow STW Seoprene 105 degree Celsius 10/3 wire installed with a cable stop to prevent damage to cable fittings. The cord reel shall be located in the upper centre rear compartment, allowing use to either side of the apparatus. Exact location to be determined at pre-production meeting.

7.04	Cord Reel - Junction Box	There will be one (1) Extenda-Lite model EJB-CS (or equivalent) back lighted electrical junction box, equipped with four (4) electrical receptacles, two on each side. Each receptacle will be equipped with a spring loaded snap cover. A cord reel will be prewired to the cast aluminum junction box to supply power to the four receptacles. An extension cord will be connected to the junction box through a heavy duty water resistant strain relief and flexible extender. Each side of the junction box will be fitted with polypropylene faceplates which are back lighted so that plug orientation to the receptacles is quick and easy to align. The receptacles shall be 15 / 20 amp GFCI
7.05	Power Bar	There shall be a 4 - 6 receptacle Power bar mounted on the Left side upper wall
7.06	12 volt distribution	There shall be a Positive post and Ground post studs for 12 volt power distribution and wiring of the 12 volt rewiring motor.
8.00	Cab Intercom System	
8.01	Sigtronic US-67S Intercom	There will be a Sigtronics US-67S intercom system supplied and installed on the apparatus. The system will have the following capabilities: Drivers Position Intercom / PTT Officers Position Intercom / PTT Three (3) Crew Positions Intercom. And in addition, one at the low ladder control pedestal, and two at the tip of the platform, these should also be PPT The following accessories shall be provided: One (1) radio adapter interfaces, eight (8) SE-8 headsets. Radio interface to be for a - Motorola Control Head 02, Model M25URS9PW1N
9.00	Platform Wiring	
9.01	Wiring	Controls within the platform area shall include: - Elevation, extension and retraction controls - Platform safety override leveling button and light - Water curtain control - Loadminder readout with alarm - Two hooded control station panel illumination lights - Monitor function controls - Intercom - Three-position speed selector switch - Consideration should be given add spare wires for additions options, or faults with wiring

X - HYDRAULICS		
Index #	Item	Specification
1.00	Hydraulics	
1.01	Hydraulic System	The hydraulic oil tank shall have an approximate capacity of 50 gallons. A dipstick shall be provided to check the oil level. The oil fill shall be furnished with a cap that shall act as a ventilator provide clean fresh air into the oil tank and a 40 micron filter to provide positive protection from contaminates. A magnetic drain plug shall be provided in a low point of the oil tank. An easily accessible 10 micron replaceable oil filter shall be installed on the hydraulic oil tank. The hydraulic oil tank shall be furnished with two pick-up tubes, one tube being used for normal operation and the other for emergency operation. The emergency pick-up tube shall extend further down into the oil tank to provide for some reserve oil in case a hydraulic line is broken. The hydraulic system shall be protected from possible hydraulic pump malfunctions by a relief valve, which shall route the excess oil into the oil tank when the pressure in the hydraulic system exceeds 3,500 PSI. The hydraulic control valves shall also be protected by being plumbed to a pressure relief valve to protect them from high pressure.

1.02	Hydraulic Pressure Gauge	There shall be a pressure gauge at the ground level control station and one at turntable control console to monitor the hydraulic system pressure. The gauge shall be liquid filled to prevent gauge shock when the hydraulic system is energized. The liquid shall not be vulnerable to freezing in sub-zero temperatures.
1.03	3 Micron, High Pressure Filter	There shall be a 3-micron filter installed in the output line of the hydraulic system, after the hydraulic pump.
1.04	Reservoir Valve	Two (2) 1/4 turn ball valves shall be installed on the hydraulic reservoir to isolate it from the hydraulic system. This shall minimize hydraulic fluid loss when changing filter elements during routine maintenance.
1.05	Emergency Hydraulic Pump	The apparatus shall be equipped with one (1) emergency hydraulic pump electrically driven from the chassis battery system. The emergency pump shall be capable of providing adequate ladder functions to stow the unit in case of main hydraulic pump failure. Two (2) control switches for this emergency pump shall be provided. One switch shall be installed at each one of the following two (2) control stations; The Turntable Control Console and the Stabilizer Control Station. Each control shall be a spring-loaded momentary switch. A red indicator light shall be mounted adjacent to each switch to indicate activation of the emergency pump.

XI - AERIAL LADDER PLATFORM		
Index #	Item	Specification
1.00	Aerial Ladder	
1.01	100' Aerial Ladder Construction Standards	The aerial ladder shall be of the mid mount design with the turntable mounted forward of the rear axle of the apparatus, and the ladder extending toward the rear of the apparatus when in the bedded position. The aerial ladder shall be comprised of a number of sections and shall extend to a nominal height of 100' at 72 degrees, measured in a vertical plane from the basket handrail to the ground to the ground. To maintain a maximum level of safety, units exceeding a 76 degree angle of inclination, in accordance with NFPA 1931/1932, current edition, shall not be acceptable.
1.02	Smart Leveling Stabilizer System	The apparatus shall contain a Smart Self Leveling (SSL) stabilizer leveling system. The SSL automatic system shall provide an easy to operate push-button feature that enables the aerial operator the ability to quickly and efficiently setup the aerial stabilizer system. The SSL stabilizer system shall automatically level the apparatus, when setup on slopes within the defined parameters as defined by the Aerial Operations Manual, to within + or - 1-degree of level. In order to maximize safety as well as to allow the ability of "short-set" operations, the SSL shall be devoted to the down function of the stabilizer system. The extension/retraction functions are to be conducted manually. The controls and indicators shall be located at the rear of the apparatus. A Class 1 UV450 display shall give the operator an actual, instantaneous visual indication of the level status of the apparatus.
1.03	Operational Envelope / Reach	The aerial ladder shall have an operations range of -12 degrees elevation to +72 degrees elevation. A minimum horizontal reach of 100' on a level surface shall be measured from the ground to the handrail of the platform at maximum extension and elevation. A minimum horizontal reach of 98' shall be measured from the turntable centerline to the leading edge of the platform with the aerial at 0 degrees elevation.

1.04	Structural Material	The primary load support members of the ladder shall be constructed of certified 100,000 PSI yield strength (minimum) steel tubing. Each section shall be trussed diagonally, vertically, and horizontally using welded steel tubing. All critical points shall be reinforced for extra rigidity and to provide a high strength to weight ratio. All ladder rungs shall be constructed of A606 Type 4 certified steel tested per ASTM A370 standards. A606 Type 4 exhibits superior corrosion resistance over regular carbon steel as a result of the development of a protective oxide film on the surface. A606 Type 4 shall meet a minimum 6.0 Atmospheric Corrosion Factor. The ladder rungs shall be round and welded to each section utilizing "K" bracing for torsional rigidity.
1.05	Primary Dimensions	The inside dimensions of the ladder shall be as follows (this is an indication and will depend on the number of sections): - Base Section: 56" - Lower Mid Section: 46" - Center Mid Section: 36" - Upper Mid Section: 28" - Fly Section: 22" The height of the handrails above the center line of the rungs shall be as follows: - Base Section: 40" - Lower Mid Section: 39" - Center Mid Section: 32" - Upper Mid Section: 29" - Fly Section: 26"
1.06	Rung Coverings	Each rung shall be covered with secure, heavy duty, deep serrated rubber sheathing. Attachment of the sheathing to the rung shall be by mechanical means and an adhesive application. Under no circumstance shall the rung covers turn when a rung is at ambient temperature (75 degrees F) or at an elevated temperature (350 degrees F); there shall be No Exception to this requirement for the safety of persons climbing the ladder sections. The sheathing shall be easily replaceable if the rubber becomes worn, however the rung covers shall be designed, constructed, and installed with lifetime service as the objective.
1.07	Turntable	<p>The turntable shall be designed in such a manner as to allow a generous working area, regardless of the position of the aerial. The aerial has a maximum elevation of 72-degrees. The turntable shall allow ample working room, within the perimeter handrail with the aerial positioned at maximum elevation. The turntable shall also be designed to allow for the most efficient use of space on the apparatus body.</p> <p>The turntable shall be a minimum of 94" side to side and 83" forward to aft.</p> <p>It shall be covered with Treadgrip Safedeck pattern decking to allow the walking surface to shed liquids with unparalleled ease and comply with NFPA intent, so as to provide secure footing for the operator in all weather conditions.</p> <p>A downward lip shall "skirt" the turntable decking around the entire circumference to provide protection from hazards.</p>

		<p>The three handrails shall each be of one-piece construction and provide large sweep corners at the edge of the turntable. Each shall be 42" high and be covered with deeply serrated rubber sheathing for maximum grip in all environments. The handrails shall be installed around the rear 180-degree perimeter of the turntable for operator and personnel safety. Each individual handrail shall be secured to the turntable by the use of two (2) minimum 5/8" anchor bolts on the underside of the turntable. Additionally, chrome plated stanchions with rubber gaskets shall be provided on the top surface of the turntable where each railing meets the decking surface.</p>
		<p>Fire Research Man saver Bars shall be installed in the two gaps between the handrails. These man saver bars shall be permanently attached at one end.</p>
		<p>All hoses and electrical lines shall be routed under removable covers so they do not present a tripping hazard. The covers shall also be designed to prevent damage from occurring to these components. Likewise, the center of the turntable shall have a removable step cover to prevent tripping hazards as well as provide for easier transition to the first rung of the aerial ladder.</p>
1.08	Aerial Pivot Pins	<p>The aerial device pivot pins shall be located on the turntable and shall attach the aerial device base section to the turntable. To maintain a suitable safety factor, the pivot pins shall be composed of certified structural steel, thereby ensuring structural integrity.</p> <p>In the interest of safety, the pivot pins shall be located as low as possible, and shall be at the aerial device base rails. This shall keep the pivot points away from the areas where persons egressing to and from the aerial base section, might place their hand(s). Aerial pivot pins shall be installed with a means provided to keep the pins in place. The design shall not inhibit the pins from being removed by a trained mechanic.</p>
1.09	Heavy Duty Ladder Travel Support	<p>A heavy-duty ladder rest with poly pads shall be provided for support of the ladder in the travel position. The travel support shall be fabricated from heavy-duty steel tubing. The travel support shall be designed to be easily removable to allow for ease of maintenance and repair when necessary. The base section of the ladder shall contain stainless steel scuff plates shall where the ladder comes into contact with the ladder support. An indicator light shall be provided on the turntable to indicate when the ladder is aligned with the travel support and may be lowered into it. The ladder rest shall be attached to the torque box for added stability. The ladder rest shall be illuminated for nighttime operation. The illumination light shall automatically turn on with the aerial master switch.</p>
1.10	Elevation System	<p>Two (2) double acting lift cylinders shall be utilized to provide smooth precise elevation from 6 degrees below horizontal to 72 degrees above horizontal. The lift cylinders shall have a 7" internal diameter (bore) and a 4" solid cylinder rod. The lift cylinders shall be equipped with integral holding valves located on the cylinder to prevent the unit from lowering should the charged lines be severed at any point within the hydraulic system.</p> <p>The lowering of the ladder shall be controlled by a pressure-limiting valve so as to limit the downward pull of the ladder when it is bedded. Both raising and lowering functions shall be influenced by flow compensation, which shall maintain ladder tip speed within the design speed regardless of load, angle, or extension. Ladder tip speed shall be decelerated above 65 degrees in order to reduce "tip-lash". Ladder lowering shall be controlled on the down motion to prevent the cylinders from completely retracting, thus allowing a cushion of oil for continuous ladder load readout.</p>

		Elevation cylinder upper and lower pivot pins shall be installed with a means provided to keep the pins in place. The design shall not inhibit the pins from being removed by a trained mechanic.
1.12	Angle Indicator (Lighted)	<p>There shall be a liquid filled angle indicator mounted on the base section of the aerial ladder. The indicator shall give accurate elevation in degrees from -20 to +80 degrees in relation to level. The liquid shall be of proper viscosity and composition to stay in liquid form even when exposed to below zero temperatures. Reading of the indicator shall be accomplished by observing the position of a suspended ball in relation to the degrees of elevation as marked on the indicator housing.</p> <p>The indicator shall be lighted for nighttime operations.</p>
1.13	Extension/Retraction System	<p>A full hydraulic powered extension and retraction system shall be provided using two (2) sets of siamese hydraulic cylinders and cables. Each set shall be capable of operating the ladder in the event of a failure of the other. Extension and retraction of the telescopic sections shall be internally limited within the cylinders, eliminating excess strain on the cables, sheaves, and ladder structure. Each of the cylinder, cable, and sheave assemblies shall be completely independent of the other, so as provide a safety factor wherein a failure of one assembly will not affect the function and operation of the other. The extension cylinders shall be equipped with counter balance holding valves to synchronize the cylinders for smoother operation and prevent the unit from retracting should the charged lines be severed at any point within the hydraulic system.</p> <p>The reeling of the cable shall be such as to provide synchronized, simultaneous movement of all sections from full extension to full retraction. All pulleys and sheaves shall be enclosed as an added safety feature. No Exception.</p>
1.14	Aerial Cable Diameters	State extension/retraction cable diameters:
		Sections:
		Fly Section:
1.15	Extension Indicator	<p>There shall be numerals affixed to the inside of the handrail of the base section, opposite the turntable control console. The numerals shall be at appropriate intervals, indicating total aerial extension in 5-foot increments. A band on the first fly section shall align with these marks at the appropriate extension distance.</p> <p>The extension indicator colour shall provide a high contrast with the colour of the ladder section to which it is applied. This shall make the length of aerial extension easily readable by the operator by merely glancing at the indicators. Numerals indicating length of extension shall be placed adjacent to indicating bands.</p>
1.16	Certified Cable Swaged Shackles	All swaged shackles ends shall have a certification test from the manufacturer of the assembly.

1.17	Wear Pads/Bearing Surfaces	Nylon wear pads impregnated with molybdenum disulfide and high in molecular weight shall be used between the telescoping sections for maximum weight distribution, strength, and smoothness of operation. This impregnation shall provide a lubricating function. Stainless steel adjustment screws shall be provided on the wear pads to permit proper side tension. Plates shall be installed on the sides of the slide pads where adjustment screws come into contact with them. No Exceptions shall be allowed to this requirement to keep the adjustment screws from embedding themselves into the pads, which may cause the pad to crack and fail.
1.18	Rotation Bearing	An approx. 48" diameter external tooth, swing circle bearing shall be used for the rotation system. The bearing shall provide 360 degrees continuous rotation. The bearing shall be designed specifically for the aerial device in lieu of the aerial device being designed to accommodate a particular bearing. The turntable base and the torque box bearing plate surfaces that contact the bearing shall be machined to prevent loading the bearing when the attaching bolts are brought to full torque. Machining of the surfaces shall be done after all welding to assure no further distortion of the material. Shims shall not be acceptable, as they shall reduce the surface contact area significantly thereby causing a concentration of forces at the shims.
1.19	Bolt Torquing From Top Side	All rotation bearing bolts shall be able to be torqued from the topside of the turntable without the bolt or nut being held under the turntable by a person. This shall require a design that shall stop all chance of the bolt "spinning" while torque is being applied to the fastener. Application of Loctite or a similar compound alone, without any other means provided to hold the fastener; shall not be acceptable. Additionally, this design feature shall not incorporate drilling, bending, welding on, or in any way; modifying the structural fastener, nut, or washers.
1.20	Rotation Gear Reduction Box	A hydraulically driven planetary gearbox with a drive speed reducer shall be used to provide infinite and minute rotation control throughout the entire rotational travel. The Rotation gear reduction box shall be installed on the topside of the turntable so that it is easily accessible, yet it shall be installed so that it does not provide an obstruction or tripping hazard to persons on the turntable. Specifically, it shall be installed toward the front of the turntable, under the aerial ladder base section. Under no circumstance shall the gearbox present any interference with the aerial device, even at low elevations. A spring applied, hydraulically released disc type swing brake shall be furnished to provide positive braking of the turntable assembly. Provisions shall be made for manual operation of the rotation system should complete loss of hydraulic power occur. These provisions shall include a hand crank supplied with the unit. The hydraulic system shall be equipped with pressure relief valves, which shall limit the rotational torque to a non-destructive power. All moving parts of the rotation gear reduction box shall be enclosed or under the turntable decking so that no safety hazards are present.
1.21	Hydraulic Swivel	The aerial device shall be equipped with a hydraulic swivel, which shall connect the hydraulic lines from the hydraulic pump and reservoir to the aerial control bank at the turntable, above the point of rotation. The hydraulic swivel shall allow for 360 degrees of continuous rotation of the aerial device with no loss of speed or capacity in functions.
1.22	Electrical Swivel	The ladder shall be equipped with an electrical swivel to allow for 360 degrees of continuous rotation of the aerial while connecting all electrical circuits through the rotation point. A minimum of thirty two (32) collector rings shall be provided.

1.23	Rotation Interlock System	The aerial device shall be equipped with a rotation interlock system to prevent the ladder from being rotated to any side where the stabilizers are not sufficiently extended to provide for the full tip load rating.
		The system shall monitor the stabilizers for extension. When a stabilizer is not sufficiently extended (short-jacked) to provide full tip load rating, the system shall prevent the aerial from being rotated more than 12 degrees past the front or rear centerline into the short-jacked side of the apparatus.
		Once activated, the system shall prevent the aerial from being rotated past the front or rear corner of the apparatus where a stabilizer is not properly deployed.
		A slowdown feature shall be built into the rotation interlock system. When the aerial is operating in a short-jacked mode, the rotational speed shall be automatically reduced, by approximately 50%, when the aerial is rotated to within approximately 10 degrees of the front or rear centerline of the apparatus. The rotational speed shall remain reduced throughout an arc of approximately 20-degrees over the front or rear of the apparatus, regardless of the direction of the rotation movement.
		The rotation function shall automatically stop when the aerial approaches the front or rear corner area of the short-jacked side of the apparatus.
		The rotation interlock system shall allow for normal operation on the side of the apparatus where the stabilizers are sufficiently extended for full tip load rating.
		An override system, activated by Push/Pull knobs within the main turntable control pedestal, shall be provided that allows the operator to rotate the aerial into the non-recommended (short-jacked) side of the apparatus, should the situation absolutely demand it.
		Push/Pull knobs shall be utilized to activate the manual override. Once the manual override is activated the aerial shall be capable of rotating to the side where a stabilizer is not fully deployed.
1.24	Apparatus Body Damage Control Interlock System	To ensure the maximum amount of safety, units allowing aerial rotation to the short-jacked side of the apparatus or systems which only include a visual and audio warning without automatically stopping rotation shall not be acceptable.
		A safety feature shall be included in the aerial operational system that minimizes the possibility of damage to the apparatus body at all angles for all standard (non-override) operational modes.
		The system shall automatically stop the downward movement of the aerial at a preset angle of elevation unless the aerial has been rotated at least 80-degrees, left or right, from the center of the ladder support. Once this rotation point is reached, full range downward movement (to minus 6 degrees) shall be allowed.
		The aerial manufacturer shall determine and set the angle of elevation where downward aerial movement is stopped. The highest point of an apparatus, in relation to the distance from the turntable, shall be used to determine the preset elevation angle stopping point.

		<p>The system shall also minimize the possibility of accidental damage to the apparatus body from aerial rotation whenever the aerial elevation is below the preset elevation angle stopping point.</p>
		<p>Rotational speed shall be reduced by approximately 50% when the aerial is rotated to within a minimum of 10 degrees of a body avoidance stopping point. Aerial rotation shall automatically stop before the aerial contacts the body of the apparatus.</p>
		<p>The body damage interlock system shall have no effect on aerial operation when the aerial is raised above the preset downward movement stopping point.</p>
		<p>The body damage interlock system shall not eliminate the possibility of damage to components such as telescopic lights that are in a raised position.</p>
1.25	Aerial Stow Operation Interlock System	<p>A safety feature shall be included in the aerial operational system that limits the possibility of damage to the apparatus when stowing the aerial.</p> <p>When a mid mounted aerial is positioned over the cab area of the apparatus, the interlock system shall not allow the downward movement of the aerial to go below a preset angle of elevation. The stow-zone shall be approximately 2-degrees of rotation to the left and right side of the center of the aerial bed support. Once this stow-zone envelope is attained, downward movement of the aerial shall be allowed for proper positioning into the bed support.</p> <p>An indicator light shall be located at the turntable control station to inform the aerial operator when the stow-zone envelope is attained.</p>
1.26	Cradle Interlock System	<p>A cradle interlock system shall be provided to prevent the lifting of the ladder from the nested position until the operator has positioned all of the stabilizers in a load-supporting configuration. A switch shall be installed at the cradle to prevent operation of the stabilizers once the aerial has been elevated from the nested position. There shall be a manual override switch that allows the ladder to be lifted from the cradle when the aerial is set up in the "Short-Jacked" configuration.</p>
1.27	Lower Control Station	<p>A control station with pendant control shall be located at the rear of the apparatus in an easily accessible area. The control panel shall be illuminated for nighttime operation. The following items shall be furnished at the control console, clearly identified and located for ease of operation and viewing:</p> <ul style="list-style-type: none"> · Individual stabilizer down indicator lights · Aerial PTO engaged indicator light · High idle switch with indicator light · Emergency hydraulic pump control with indicator light · Stabilizer/Aerial diverter control with indicator light · Level assist switch · Side to Side leveling bubble <p>A weatherproof compartment shall be furnished behind the control panel and shall contain the aerial circuit breakers, interlock components and control circuit distribution terminals.</p>

1.28	Turntable Control Console	<p>The turntable control station will be located on the right side of the turntable so the operator may easily observe the basket while operating the controls. A console cover will be provided at the turntable control station. The controls will be so designed to allow the turntable control station to immediately override the basket controls even if the ladder is being operated by the basket controls. The following items will also be provided at the turntable control station and be clearly identified and illuminated for nighttime operation and conveniently located for ease of operation and viewing:</p> <ul style="list-style-type: none"> • Three (3) separate controls for raise/lower, extend/retract, and left/right rotation • Intercom controls • Tip tracking light switch • Emergency power unit switch • Operator's load chart • Two (2) position switch for selecting aerial operational speed • Aerial monitor switches
1.29	Basket Control Station	<p>The basket control station will be located at the front, center of the platform basket. The following items will also be provided at the basket control station and be clearly identified and illuminated for nighttime operation and conveniently located for ease of operation and viewing:</p> <ul style="list-style-type: none"> • Three (3) separate controls for raise/lower, extend/retract, and left/right rotation • Intercom controls • Tip tracking light switch • Basket leveling switches • Operator's load chart • Aerial monitor switches
1.30	Aerial Loadminder System	<p>There shall be a LoadMinder at the operator's pedestal that indicates the load(s) on the aerial device. The display shall be in the form of an LED illuminated bar graph. The instrument shall be readable in day and night conditions. The display shall be a "real-time" display, thereby giving immediate readings to the operator. Additionally, a colour coded bar shall be above and below the actual LED bar graph, to surround the actual reading given to the operator; thereby making the display easier and faster to read. The colour-coded bars shall progress from Green to Yellow, and finally to Red. When the LED bar graph illuminates, representing a load on the aerial ladder, the operator need only glance at the display to determine the load applied to the aerial device - in relation to 100% rated aerial device capacity.</p>
		<p>The readout given by the display shall be continuous, shall be relative to the NFPA compliant aerial device rated capacity as stated in these specifications, and shall including (but not be limited to) the following items:</p>
		<p>Accumulated equipment on any and all ladder sections, or at the tip including manufacturer installed items or customer-installed items.</p>
		<p>Accumulated personnel on any and all ladder sections or at the platform</p>
		<p>Accumulated ice buildup on any and all ladder sections or at the platform.</p>
		<p>The total load suspended from any load lifting / rappelling eye installed by the manufacturer.</p> <p>Any load reaction from dynamic loads placed on or realized by the aerial structure.</p>

		<p>Any water weight or reactionary force realized by the aerial structure.</p>
		<p>Any combination of the above items.</p>
		<p>The Loadminder as described shall be designed in such a manner that the operator will not have to refer to an angle indicator, extension tape, or load chart; or be required to guess at, or try to calculate the loads or forces applied to, or interacting with the aerial device at any given time, and in any situation. This shall be in compliance with NFPA 1901 newest revision. Systems that require the use of a load chart, angle indicator or extension tape shall not be acceptable for safety reasons.</p>
		<p>The LoadMinder shall be connected to a 100 dba alarm at the operator's control station that shall sound when the ladder load is above the rated capacity. This alarm system shall also be connected to two (2) strobe lights on the end of the base section, one on each side, to provide further notice to the operator of an unsafe condition. A test button shall provided to test the operation.</p>
1.31	Aerial Ladder Load Chart	<p>Two (2) load charts installed on the aerial platform; one (1) at the turntable control console, and one (1) in the platform at the tip of the aerial. The load charts shall illustrate the full operating range of the platform, with the waterway dry or flowing water.</p>
1.32	Aerial Communication System	<p>An Atkinson Dynamics two (2) station communication system shall be provided between the aerial platform and the turntable control console. The communication system shall be a two-way system with the communication speaker at the platform requiring no operator attention to transmit or receive. The transmitting and receiving volume controls shall be located at the turntable control console.</p>
1.33	Hour Meter	<p>There shall be an hour meter installed at the turntable control station, connected to the system engagement control for the aerial. The meter shall register the total hours of aerial use for scheduling periodic maintenance.</p>
1.34	Breathing Air System	<p>Breathing air shall be supplied to the aerial platform. The air system shall include two (2) 4500 PSI, 444 cubic foot air cylinders. The cylinders shall be mounted to the base section of the ladder using bracket mounts. The air cylinders shall be interconnected to the air system through a pressure regulator. A shut-off valve shall be supplied with each cylinder. In order to protect the valve and the regulator, a tread plate guard shall be installed over the end of each cylinder. The air system shall be routed to the platform using hose specially designed for use in breathing air systems. At the platform, the breathing air shall be piped to two (2) air mask quick disconnects located on the front wall. A 50' refill hose shall be provided for refilling the air cylinder without having to remove the tank from its mounting.</p>
		<p>Three (3) quick disconnect air outlets shall be provided. One (1) shall be mounted at the turntable console and two (2) shall be mounted on the front wall of the platform.</p>

		The apparatus shall be equipped with a Class1 Dual Airminder system to provide the operator a visible indication of the air remaining in the breathing air system and to offer a visual and audible warning when the level becomes too low. Indicators shall be located on the turntable control console and in the platform.
2:00	Basket/Platform	
2.01	Structure	The complete basket structure will be constructed of welded high strength steel certified by the manufacturer to have a minimum of 100,000 lb per square inch yield strength on all structural members. The aerial basket will be fully tested and independent third party certified.
2.02	Basket Size	The flooring of the basket will be aluminum grating with an aggressive serrated surface. This decking shall provide excellent footing in all environments and working conditions The floor will measure approximately 33 long x 72 wide. The stepping surfaces will meet the skid-resistance requirements of current NFPA 1901 standard.
2.03		Four (4) stainless steel pompier belt safety loops should be attached to the inside of the basket. Two (2) lifting eyes will be provided on the bottom side of the basket support structure. Each lifting eye will be rated for 500lb.
2.04		Four (4) rubber bumpers are provided on the bottom side of the basket structure for damage protection when setting it down on a surface.
2.05	Platform Access Gates	The sides of the basket will be of tubular steel construction and aluminum sheet skin, and along with the basket doors, will form a continuous 42.00" high wall around the basket. Two (2) swing-in, spring-loaded, self-closing doors will be of steel frame construction with an aluminum sheet skin and will be provided on the 45 degree angles at the front of the platform. A paddle style 104 of 133 door latch will allow the basket doors to be opened from the outside by applying pressure to the paddle with the hand. The rear of the platform will be equipped with a vertical self-closing gate for transfer to and from the platform's ladder device.
2.06	Hose Box	There will be one (1) hose storage box(es) with a cover and rubber draw latch provided at the platform. A brushed stainless steel scuffplate will be provided under each latch. The box(es) will be located at the right side of the basket when viewed from the turntable and will match the finish of the aerial device. The box(es) will be sized to fit 50' of 1.75" diameter hose. Drain holes will be provided in the bottom corners of each box and a louver will be provided on each side near the top of the box, below the latches.
2.07	Basket Heat Shield	A heat reflective shield constructed of 0.063 aluminum will be provided on the front, sides, bottom, and access doors of the basket. The front, side and access door heat shields will be painted to match the aerial basket. The heat shields on the bottom of the basket will be easily removable for ease of servicing components located under the basket. These heat shields will be provided with a non-glare finish.
2.08	Water Curtain	To further protect from any heat below the platform, a water curtain nozzle with a circular pattern shall be mounted in the center of the underside of the platform. This device shall be electrically actuated from the platform control station and provide a minimum of a 75 GPM spray.
2.09		Universal accessory mounting receptacles will be permanently affixed on the left side of the basket to receive options such as the rescue basket holders, rappelling arms, roof ladder brackets, winch, etc. Complete interchangeability will be required without modification to the basket.
2.10	12-Volt Receptacles At Ladder Platform	There shall be one (1) 12 volt receptacles provided at the ladder platform.

2.11	Aerial Mounted Pick Axe Bracket	There shall be one (1) pickaxe-mounting bracket installed on the fly section. In addition to providing the bracket, a strap shall be provided to hold the axe in the bracket.
2.12	Pick Head Axe - Fiberglass	There shall be one (1) Pick Head Axe provided in the bracket on the fly section.
2.13	Aerial Mounted Pike Pole Bracket	There shall be one (1) pike pole-mounting bracket installed on the fly section. In addition to providing the bracket, a strap shall be provided to hold the pike pole in the bracket
2.14	Pike Pole	There shall be one (1) 6' Pike Pole, Duo Safety WP6, provided in the bracket on the fly section.

XII - AERIAL WATERWAY		
Index #	Item	Specification
1.00	Waterway System	
1.01	General	A waterway system shall be provided consisting of the following components and features.
		A 5" outside diameter pipe shall be connected to the water supply on one end and to a water swivel at the rotation point of the turntable. The swivel shall allow the ladder to rotate 360 degrees continuously while flowing water.
		A 5" inside diameter pipe waterway swivel shall be routed through the rotation point swivel up to the heel pin swivel. The heel pin swivel shall allow the water to flow to the waterway while elevating the aerial ladder from - 8 degrees below to +72 degrees.
		The heel pivot pin shall not be integral with the waterway swivel at any point. The design of the water way shall allow complete servicing of the waterway swivel without disturbing the heel pivot pin.
1.02	Waterway Pipe Diameters	The integral telescopic water system shall consist of a 5.50" diameter tube for the base section, 5.00" diameter tube for the lower mid section, 4.50" diameter tube for the center mid section, 4.00" diameter tube for the upper mid section, and 3.50" diameter tube for the fly section.
1.03	Waterway Material - Chrome Plated Steel	The telescopic water pipes shall be composed of high quality steel. The pipes shall be professionally prepared to accept a highly durable, hot dipped galvanizing coating. Preparation shall include degreasing as needed followed by wheel-o-braiding to remove any contaminates or scale.
		Following preparation, each water pipe shall be hot dipped galvanized. The pipes shall be completely submerged in the galvanizing bath to ensure 100% coverage, and intimate bonding of the galvanic coating to the steel. Following the dipping process, all dross shall be ground and the perimeter of the pipe shall be ground to a smooth finish.

		<p>Each pipe shall then be prepared to be heavily chrome plated. Materials (nickel / copper/chrome) used in the chrome plating process shall be of the highest purity to complete the chrome plating process. The chrome shall be polished to an extremely high luster.</p>
		<p>The result of the preceding processes shall be an aerial waterway that is of unequalled quality and durability. The heavy galvanizing and CP-84 chrome plating shall ensure that no corrosion occurs on the waterway, and that the outer surface remains smooth for long seal life. Additionally, the chrome plating shall aid in preventing nicks, scratches, and abrasions from occurring where they would otherwise easily occur with softer and more malleable aluminum tubes.</p>
		<p>The waterway on the base section of the aerial device shall be galvanized with the process described above, followed by complete coverage utilizing PPG paint of job colour.</p>
1.04	One (1) Waterway Relief Valve	<p>A ¾" safety relief valve shall be installed in the base section waterway. The relief valve shall be pre-set at 240 psi. The valve shall protect the waterway from overpressure, which is normally caused by the capping of the monitor outlet. This valve shall in no way is to act as a relief for the total flow of the system.</p>
1.05	Waterway Drain Valve	<p>Waterway Drain Valve An 1-½" drain valve shall be installed in the lower section of the aerial plumbing under the truck. The valve, when opened, shall drain the aerial waterway and lower plumbing</p>
1.06	Aerial Waterway Rear Inlet / Outlet	<p>There shall be a 4" aerial waterway inlet / outlet installed on the rear of the apparatus. The inlet / outlet shall be as low as possible to reduce the amount of weight on the fire hose coupling. Inlet / outlets that are located in areas that would cause the hose to block access to equipment or stepping areas shall not be acceptable.</p>
1.07	Waterway Butterfly Valve	<p>There shall be a 4" electric over air-actuated butterfly valve in the waterway. The valve shall be controlled from a switch on the pump panel. This valve shall allow the aerial inlet to be used to supply the aerial device when open, or as a discharge from the pump when it is closed.</p>
1.08	Aerial Inlet Fitting	<p>The 4" aerial inlet shall be provided with a male fitting that terminates with 4" NST threads.</p>
1.09	Storz Adapter	<p>There shall be one (1) 4" storz x 4" swivel female NST, rocker lug, 30° adapter supplied. The adapter shall be manufactured from lightweight aluminum alloy</p>
1.10	Storz Adapter	<p>There shall be one (1) 4" storz x 2-½" male BCT/BAT supplied. The adapter shall be manufactured from lightweight aluminum alloy with a hard anodized finish for corrosion protection.</p>
1.11	Cap W/Cable	<p>There shall be a 2-½" BCT/BAT cap with cable supplied. The cap shall be polished to remove manufacturing irregularities and a chrome finish shall be applied to the polished surface. The cable shall be a 12" long, coated airline cable with looped ends for attachment.</p>

1.12	Aerial Nozzle Safety Chain And Screw Bracket	There shall be a safety cable attached to the aerial nozzle to allow the nozzle to be removed. A bracket with a 3-1/2" screw base shall be provided on the fly section for the nozzle to mount on.
1.13	Elevated Master Stream Appliance	<p>An Elkhart Brass 8294-04 Scorpion remote controlled all electric single waterway monitor shall be installed at the end of the waterway. The monitor shall be equipped with two (2) drive positioning motors, one each for vertical and horizontal movement. Each positioning control shall be equipped with a manual override.</p> <p>The monitor shall be capable of vertical travel of 45 degrees above to 45 degrees below horizontal and horizontal travel to be 180 degrees. The rated tip load of the aerial device shall not be affected by the position of the nozzle throughout the entire range as listed above.</p>
1.14	Elkhart SM-1250e Nozzle	An Elkhart Select-O-Matic master stream nozzle model SM-1250E complete with a 3.5" swivel base shall be provided. The nozzle shall be equipped with an electric pattern control. The nozzle shall be designed for flows of 1250 gpm. The nozzle shall be rated at an operating pressure of 75 psi.
1.15	1-1/2" Pre-Connect	One (1) 1-1/2" NH pre-connect shall be located in the rear floor of the platform. The pre-connect shall be gated at the outlet with a quarter turn valve. A tread plate box shall be provided to hold up to 10' of 1-3/4" hose with a nozzle attached.
1.16	2-1/2" Discharge	A 2-1/2" discharge is required per NFPA 1901, current edition. Selecting this option without a 2-1/2" discharge(s) at the tip will require a signed SOE.
1.17	12 Function Handheld Radio Remote For Aerial/Monitor/Nozzle	<p>There shall be a remote control system installed on the apparatus. The remote control system shall operate the normal aerial operation functions and the monitor, nozzle functions.</p> <p>The radio remote control system shall consist of a modulator/transmitter unit and a receiver/decoder unit. The system shall operate on the 5RF channels in accordance with FCC Subpart D - low power communications devices, part 15.117.</p> <p>The control box shall contain three toggle switches for the aerial functions and three toggle switches for the monitor/nozzle functions. There shall be an on/off switch and an emergency off switch on the control box. The control box shall contain a finger trigger that is conveniently located on the back bottom portion of the control box.</p> <p>The trigger switch located on the bottom portion of the control box shall be utilized to determine the variable speed of the respective aerial functions.</p>
1.18	Two Control Stations For The Elevated Master Stream Appliance	The aerial master stream device shall have two (2) separate control stations. One station shall be at the main aerial turntable control console the other station shall be located at the tip of the ladder. Each station shall have the capability of controlling the nozzle pattern as well as the horizontal and vertical position of the device.

XIII - PAINT & DECALING

Index #	Item	Specification
1.00	Apparatus Paint	
1.01	Cab Two Tone Paint	The cab shall be painted two tone with a finished break line 1.5" below the cab side windows and down to the top of the grill on the cab front fascia. All cab painting must be completed prior to the installation of glass accessories or any other cab trim to assure complete paint coverage and maximum corrosion protection.
1.02	Cab Upper Paint Colour	Shall be PPG FBCH 2185 WHITE
1.03	Cab Lower Paint Colour	Shall be the same as the rest apparatus which will be painted (RED) PPG# FBCH - 75380 alt
1.04	Cab Upper and Lower Paint Break striping	A .5" (1/2") gold reflective tape with black borders shall be applied on the break line between the two different coloured surfaces.
1.05	Apparatus Body Paint	The apparatus will be painted with High Solids Polyurethane Base/Clear Coat.
1.06	Apparatus Body Paint Colour	The apparatus will be painted (RED) PPG# FBCH - 75380 alt
1.07	Touch Up Paint	One (1) container of touch-up paint will be supplied for each colour.
1.08	Paint Interior Cab	The interior metal surfaces shall be painted with a "Zolatone type" black/gray texture finish.
1.09	Paint Inner Door Panels	The inner door panel metal surfaces shall be painted with a "Zolatone type" black/gray texture finish.
1.10	Body Compartmentation Coatings	The interior of the body compartments will be coated with a gray (preferred) thermo-plastic polyurethane coating. The coating will be durable enough to withstand everyday abuse of equipment removal and shifting.
1.11	Pump House Paint Colour	The paint will be job colour, same as the body (RED) PPG# FBCH - 75380 alt
1.12	Pump plumbing and valves	No Paint
1.13	Aerial Component Protection / Paint	<p>All aerial device components above the rotation point that are not chrome plate bright aluminum treadplate or stainless steel shall be painted. All areas to be painted shall be sanded to remove any metal flakes and smooth any rough surfaces. All surfaces to be painted shall be phosphatized to remove metal impurities, aid paint adhesion and inhibit rust. The components shall be prime painted with an Low V.O.C. high solids non-isocyanate primer and finish painted with a Low V.O.C. extremely durable, single stage ultra high solids high gloss polyurethane paint. The support structure and components below the rotation point shall be painted black.</p> <p>Prefer the extending stabilizer beams, inner jack cylinder protective tubes, and stabilizer pads shall be hot dip galvanized.</p>

1.14	Aerial Corrosion Protection	The majority of the internal structural members of the aerial structure shall be 100% concealed from oxygen. Totally concealed members are not subject to the possibility of corrosion attacking the metal from the interior. Structural tubing of the aerial structure that contains drilled holes or is exposed to outside air and elements shall be protected to eliminate the possibility of corrosion occurring from the inside of the tube.
		The interior of exposed tubing shall be coated with a compound labeled NWAC 120-4. The application of the coating shall be applied after the welding process of the aerial structure is complete and shall cover 100% of the interior of the structural tube.
		NWAC 120-4 is an effective cavity corrosion inhibitor that provides long-term protection for both ferrous and non-ferrous metals. The resulting water-repellant, flexible, air-dried film has a remarkable crevice penetrating, spreading and clinging characteristic. The product dries to a nearly transparent film and provides maximum corrosion protection for all void spaces subject to humidity and condensation.
		Use of this process shall constitute a 20-year internal corrosion warranty for the aerial structure.
1.15	Aerial Device Paint Colour	The aerial device shall be painted with PPG Delfleet High Solids polyurethane enamel paint. The colour shall be PPG# FDGH2185 white.
1.16	Aerial Ladder Egress Paint Colour	The aerial ladder egress shall be painted with PPG Delfleet High Solids polyurethane enamel paint. The colour shall be PPG# FDGH4353 red.
1.17	Aerial Torque Box Paint	The aerial torque box shall be painted with PPG polyurethane enamel paint. The colour shall be (Black) PPG# MTK - 9000.
2.00	Reflective Lettering / Decals	
2.01	Lettering Colour	Gold Reflective with Black outline / shadowed
2.02	Lettering Font	Symbol ITC (Roman) font
2.03	Lettering Size	Approx. 4"
2.04	# of Letters per Apparatus	73 including the rear compartment lettering
2.05	Lettering Locations	"FIRE RESCUE" to be applied to the front of the cab with "FIRE" on RH and "RESCUE" on LH. "FIRE / RESCUE" to be on L2/R2 in the 4" White stripe. "CITY OF SURREY" on LH upper body.
2.06	Rear compartment Reflective lettering	"KEEP BACK 150 METERS" to be on door in Black diamond grade reflective. Letters to be bold font for best possible visibility.

2.07	6" Reflective Canadian Flag	There shall be two (2) 6" reflective (wavy type) Canadian Flags installed on the apparatus. The flags shall be located above the front cab doors ahead of the 810-scene light.
2.08	Custom Door Decals	There shall be a pair of custom door decals supplied by the customer that shall be installed by the OEM manufacturer.
2.09	Aerial Special Labels	<p>Legible, permanent signs shall be installed in positions readily visible to the operator to provide operational directions, warnings, and cautions. The signs shall describe the function of each control and provide operating instructions.</p> <p>Warning and caution signs shall indicate hazards inherent in the operation of the aerial device. These hazards shall include, but shall not be limited to:</p> <p>Electrical hazards involved where the aerial device does not provide protection to the personnel from contact with, or near proximity to, an electrically charged conductor.</p> <p>Electrical hazards involved where the aerial device does not provide protection to ground personnel who might contact the vehicle when in contact with energized electrically charged conductors.</p> <p>Hazards from stabilizer motion.</p> <p>Hazards that can result from failure to follow the manufacturer's operating instructions.</p>
2.10	Aerial Device Specification Placard	<p>A permanent label shall disclose the following information relative to the aerial device:</p> <ul style="list-style-type: none"> · Make · Model · Insulated or non-insulated · Serial number · Date of manufacture · Rated capacity (s) · Rated vertical height · Rated horizontal reach · Maximum hydraulic system pressure · Hydraulic oil type and capacity · All other appropriate labels to ensure safe operation of the aerial device shall be permanently affixed in conspicuous locations.

2.11	Manufacturing Labels	A permanent plate shall be mounted in the driver's compartment specifying the quantity and type of the following fluids that may be used in the apparatus for normal maintenance. Where a fluid is not applicable to the unit, the plate shall be marked N/A to inform the service technician who may not be familiar with the apparatus.
		· Engine oil
		· Engine coolant
		· Transmission fluid
		· Pump transmission fluid
		· Pump primer fluid
		· Drive axle fluid
		· Air conditioning refrigerant
		· Power steering fluid
		· Cab tilt mechanism fluid
		· Transfer case fluid
		· Equipment rack fluid
		· Air compressor system lubricant
		· Generator system lubricant
		· Front tires air pressure
· Rear tires air pressure		

		<p>A permanent plate shall be affixed in the driver's area that states the maximum number of personnel allowed to ride on the apparatus at any time. A sign shall be affixed in the chassis cab, in plain sight of the driver that states the overall travel height, overall length, and gross GVWR of the apparatus. On any gated inlet on the apparatus, a permanent label shall be provided that states:</p> <p>"WARNING: Death or serious injury might occur if proper operating procedures are not followed. The pump operator as well as individuals connecting supply or discharges hoses to the apparatus must be familiar with water hydraulics hazards and component limitations."</p> <p>All other appropriate labels to ensure safe operation of the apparatus shall be permanently affixed in conspicuous locations.</p>
3.00	Reflective Striping	
3.01	NFPA Compliant Reflective Striping	<p>Reflective striping will be applied to the exterior of the apparatus in a manner consistent with the National Fire Protection Association (NFPA) 1901, latest edition. It will consist of a 1", 4", and a 1" wide stripe low across the front of the chassis and along the sides up to the first compartment on each side where it shall then angle up and back to a point above the wheel well area where it shall then run level to the back edge of the body. There will be a 1" gap provided between each of the stripes.</p> <p>A 6" wide, red/green-yellow chevron stripe will be applied across the rear of the apparatus at 45-degree angle. To be determined at pre-production meeting</p>
3.02	Rub rail reflective striping	There shall be 2" reflective striping installed in the rub rail channel. The reflective striping shall be diamond grade quality material for increased visibility. The reflective shall be silver in colour.
3.03	Door Panel Chevron	Each door will have reflective chevron and a reflective stripe on the outer edge
4.00	Body Compartment Coating	
4.01	General	The interior of the body compartments will be coated with a gray (preferred) thermo-plastic polyurethane coating. The coating will be durable enough to withstand everyday abuse of equipment removal and shifting.

<u>XIV - OPTIONS & REQUIREMENTS</u>		
Index #	Item	Specification
1.00	Manuals	For all lists and manuals below Preference will be for Digital copies to be included.
1.01	Operations Manual	Two (2) Hard copy Operations manuals for entire Apparatus. One (1) digital copy.
1.02	Maintenance Manual	Mechanical Maintenance Manuals for entire Apparatus
1.03	Parts Listing	Parts listing for all parts shall be provided
1.04	Engine Manual	Engine Operation and Maintenance Manuals
1.05	Transmission Manuals	Transmission Operation and Maintenance Manuals

1.06	Required Software licences	Engine Diagnostic software - Cummins Quick Check
1.07		ABS Diagnostic software
1.08		SRS Diagnostic software
1.09		Multiplex Diagnostic software
1.10		Additional Software as required
1.11		N/A
1.12	Pump Manual	Two (2) Pump Operation & Maintenance manuals will be supplied at the time of delivery.
2.00	Drawings	
2.01	Build Drawings	As built spec specific drawings
2.02	Wiring Drawings	As built spec specific Wiring Diagrams
2.03	Electrical Schematics	A complete electrical schematic for the apparatus is to be provided. This schematic will be specifically prepared for this individual unit rather than a generic schematic designed to accommodate all apparatus.
2.04	Measurement Schematic	As built Schematic of measurements
2.05	Alignment Drawing certification	As built Alignment certification
3.00	Inspections	
3.01	Pre-Production Meeting	Required
3.02	Inspection #1 - Cab, Chassis and main fire pump	Required
3.03	Inspection #2 - Inspection of Pump installation, all plumbing, structural body installed, and, primed and ready for Pre Paint Inspection	Required
3.04	Inspection #3 Pre delivery inspection	Required
3.05	Training and Support Services	Refer to Sections 46 through 54 of Schedule A – SPECIFICATIONS OF GOODS – PART I GENERAL REQUIREMENTS for additional information.

4.00	Over Weight Permit	
4.01		The supplier will provide the fire department with an overweight operating permit for the City of Surrey and any highways the unit may operate on, whether in service or travelling to the suppliers maintenance facility
5.00	Optional Items	
5.01	Directional Lighting LED - Option 2	Directional LED lighting running from mid-point on rear of apparatus down the side of the apparatus above the side compartment header. LED micro lighting would be amber in colour and activated through a multiplex switch or separate controller. Lighting would act as a traffic directional advisor. This lighting will allow for the apparatus to be parked on an angle to the road protecting the scene and having the directional amber lights running from the rear of the truck down the side towards the front along the upper header above the side compartments. This option would be a custom build and a preferred option over the Directional Lighting LED option 1.
6.00	Additional Equipment	
6.01	Axe Bracket	There will be two (2) axe mounting brackets/pockets located on the apparatus. Exact design to be determined at pre-production meeting. Locate on the front surface of the fire body, one (1) each side.
6.02	Pinch Point Crow Bar Bracket	Supply one (1) Akron PPBH (or equivalent), raised mount, pinch point bar holder set. Ship loose.
6.03	PPV Fan	Supply one (1) V18-BL-12-AC-SP 18" fan with charger & two batteries (or approved equivalent)
6.04	Electronic Valve controllers	Supply (1) additional controller as stock part (ship loose)
6.05	Multiplex Display	Supply one (1) additional Multiplex Display (ship loose)
7.00	SFS Supplied Additional Equipment	
7.01	Antennas	Surrey Fire Service will supply (2) Antennas to be mounted on the roof of the Cab. One (1) shall be mounted on the Upper Left side while the other to be mounted on the Upper Right side. Exact location to be determined at Pre production meeting.
7.02	2 Way Radio	Surrey Fire Service Shall Supply a 2-way radio that will be flush mounted in the center console on the officer's side of center above the electronic siren.
7.03	Door Crest Decals	There shall be a pair of custom door decals supplied by the customer that shall be installed by the OEM manufacturer.

XV - MEASUREMENTS		
Index #	Item	Specification
1.00	Complete Vehicle	<p>The overall size, weight and manoeuvrability of the finished apparatus are critical values to the Surrey Fire Service.</p> <p>Note: Contractor should provide a preliminary review drawing(s) / diagrams / schematics outlining the proposed Goods and preferably showing all sections of the below measurements.</p>
1.01	Overall Height	
1.02	Overall max Width	Surrey Fire Service is committed to the best fit package in which we can achieve the smallest possible vehicle while keeping to the constraints of this spec.
1.03	Overall Length	Surrey Fire Service is committed to the best fit package in which we can achieve the shortest possible vehicle while keeping to the constraints of this spec. Please provide the following details:
1.04	Chassis Wheelbase	
1.05	Angle of Approach	
1.06	Angle of Departure	
1.07	Break-over clearance	
2.00	Steering	
2.01	Cramp Angle To the Left	
2.02	Cramp Angle to The Right	
2.03	Turning Radius	
2.04	Wall to Wall	
3.00	Cab	
3.01	Overall Height	
3.02	Cab Width	
3.03	Cab Length	
4.00	Cab Interior	
4.01	Floor to ceiling height non raised roof	

4.02	Drivers seat area width	
4.03	Floor to ceiling height in raised roof area	
4.04	Officers seat area width	
4.05	Crew area span width	
4.06	Crew area height from floor to ceiling	
4.07	Crew Area height from seat to ceiling height	
4.08	Crew area leg room from seat in down position to dog house depth	
5.00	Cab Doors	
5.01	Drivers door Height from Cab Floor	
5.02	Drivers door Opening Width	
5.03	Officers door Height from Cab Floor	
5.04	Officers door Opening Width	
5.05	Right side Crew door Height from Cab Floor	
5.06	Right side Crew door Opening Width	
5.07	Left side Crew door Height from Cab Floor	
5.08	Left side Crew door Width Opening	
5.09	Drivers entry step measurements	First step - 11.5" deep x 31.13 " wide Intermediate step -8.5" deep x 32.5" wide
5.10	Officers entry step measurements	First step - 11.5" deep x 31.13 " wide Intermediate step -8.5" deep x 32.5" wide
5.11	Right side Crew entry step measurements	First step 11.5" deep x 22.44" wide Intermediate step 10.25" deep x 22.75" wide
5.12	Left side Crew entry step measurements	First step 11.5" deep x 22.44" wide Intermediate step 10.25" deep x 22.75" wide
6.00	Body	

6.01	Body Width	100"
6.02	Overall Height	130"
6.03	Overall Length	Approximate 520"
6.04	Body rear overhang	Surrey Fire Service is committed to the best fit package in which we can achieve the shortest possible vehicle while keeping to the constraints of this spec. Maximum rear overhang shall be 90".
7.00	Compartments - As Applicable	
7.01	RH Mid EMS Compartment Dimensions	See Main Body - Compartment Specifications
7.02	Curb side - R1 - Height	See Main Body - Compartment Specifications
7.03	Curb side - R1 - Width	See Main Body - Compartment Specifications
7.04	Curb side - R1 - Upper Depth	See Main Body - Compartment Specifications
7.05	Curb side - R1 - lower Depth	See Main Body - Compartment Specifications
7.06	Curb side - R2 - Height	See Main Body - Compartment Specifications
7.07	Curb side - R2 - Width	See Main Body - Compartment Specifications
7.08	Curb side - R2 - Upper Depth	See Main Body - Compartment Specifications
7.09	Curb side - R2 - Lower Depth	See Main Body - Compartment Specifications
7.10	Curb side - R3 - Height	See Main Body - Compartment Specifications
7.11	Curb side - R3 - Width	See Main Body - Compartment Specifications
7.12	Curb side - R3 - Upper Depth	See Main Body - Compartment Specifications
7.13	Curb side - R3 - Lower Depth	See Main Body - Compartment Specifications
7.14	Curb side - R4 - Height	See Main Body - Compartment Specifications
7.15	Curb side - R4 - Width	See Main Body - Compartment Specifications

7.16	Curb side - R4 - Upper Depth	See Main Body - Compartment Specifications
7.17	Curb side - R4 - Lower Depth	See Main Body - Compartment Specifications
7.18	Curb side - R5 - Height	See Main Body - Compartment Specifications
7.19	Curb side - R5 - Width	See Main Body - Compartment Specifications
7.20	Curb side - R5 - Upper Depth	See Main Body - Compartment Specifications
7.21	Curb side - R5 - Lower Depth	See Main Body - Compartment Specifications
7.22	Street side - L1 - Height	See Main Body - Compartment Specifications
7.23	Street side - L1 - Width	See Main Body - Compartment Specifications
7.24	Street side - L1 - Upper Depth	See Main Body - Compartment Specifications
7.25	Street side - L1 - Lower Depth	See Main Body - Compartment Specifications
7.26	Street side - L2 - Height	See Main Body - Compartment Specifications
7.27	Street side - L2 - Width	See Main Body - Compartment Specifications
7.28	Street side - L2 - Upper Depth	See Main Body - Compartment Specifications
7.29	Street side - L2 - Lower Depth	See Main Body - Compartment Specifications
7.30	Street side - L3 - Height	See Main Body - Compartment Specifications
7.31	Street side - L3 - Width	See Main Body - Compartment Specifications
7.32	Street side - L3 - Upper Depth	See Main Body - Compartment Specifications
7.33	Street side - L3 - Lower Depth	See Main Body - Compartment Specifications
7.34	Street side - L4 - Height	See Main Body - Compartment Specifications
7.35	Street side - L4 - Width	See Main Body - Compartment Specifications
7.36	Street side - L4 - Upper Depth	See Main Body - Compartment Specifications

7.37	Street side – L4 – Lower Depth	See Main Body - Compartment Specifications
7.38	Street side – L5 - Height	See Main Body - Compartment Specifications
7.39	Street side – L5 - Width	See Main Body - Compartment Specifications
7.40	Street side – L5 – Upper Depth	See Main Body - Compartment Specifications
7.41	Street side – L5 – Lower Depth	See Main Body - Compartment Specifications
7.42	Upper Body Compartment - Depth	See Main Body - Compartment Specifications
7.43	Upper Body Compartment - Width	See Main Body - Compartment Specifications
7.44	Upper Body Compartment - Length	See Main Body - Compartment Specifications
7.45	Under Hose Bed Compartment - Height	See Main Body - Compartment Specifications Requirements for equipment
7.46	Under Hose Bed Compartment - Width	See Main Body - Compartment Specifications Requirements for equipment
7.47	Under Hose Bed Compartment - Depth	See Main Body - Compartment Specifications Requirements for equipment
8.00	Weights	The weight of the miscellaneous equipment is to be evaluated by the Proponent and a GVWR and GAWR will be provided to safely carry the fully equipped "wet "apparatus including all tanks, pump, specified hose load, personnel weight and ground ladders. The weight rating shall include a minimum safety factor of 10% in its evaluation.
8.01	GVW	Certified readings document for each apparatus
8.02	GAWR - Front	Certified readings document for each apparatus
8.03	GAWR - Rear	Certified readings document for each apparatus
8.04	Dry Weight (entire Apparatus)	Certified readings document for each apparatus
8.05	Wet Weight (entire Apparatus, fully loaded)	Certified readings document for each apparatus
8.06	Dry Weight Front Axle	Certified readings document for each apparatus
8.07	Wet Weight - Front Axle (fully loaded)	Certified readings document for each apparatus
8.08	Dry Weight Rear Axle	Certified readings document for each apparatus

8.09	Wet Weight - Rear Axle (fully loaded)	Certified readings document for each apparatus
8.10	Centre of Gravity	

REFERENCE INFORMATION

The following documents are included as reference information to assist the Contractor in preparing their Quotation.

1. Schedule B-1 – Technical and Functional Specifications – Requirements Response Matrix.
2. Schedule B-2 – Additional Warranty Response Matrix.

The Technical and Functional Specifications – Requirements Response Matrix, attached as Schedule B-1 and Additional Warranty Response Matrix, attached as Schedule B-2, forms a part of and is incorporated into Parts I & II of this Schedule A – Specifications of Goods.



SCHEDULE B – QUOTATION

RFQ Title: SUPPLY AND DELIVERY OF ONE ONLY 100 FT. MID-MOUNT TOWER FIRE APPARATUS

RFQ No: 1220-040-2024-032

CONTRACTOR

Legal Name: _____

Contact Person and Title: _____

Business Address: _____

Business Telephone: _____

Business Fax: _____

Business E-Mail Address: _____

CITY OF SURREY

TO:

City Representative: Sunny Kaila, Manager, Procurement Services

Email: purchasing@surrey.ca

1. If this offer is accepted by the City, such offer and acceptance will create a contract as described in:
 - (a) the Agreement
 - (b) the RFQ;
 - (c) the specifications of Goods set out above and in Schedule A; and
 - (d) other terms, if any, that are agreed to by the parties in writing.

2. Capitalized terms used and not defined in this Quotation will have the meanings given to them in the RFQ. Except as specifically modified by this Quotation, all terms, conditions, representations, warranties and covenants as set out in the RFQ will remain in full force and effect.

3. I/We have reviewed the RFQ Attachment 1 – Draft Quotation Agreement – Good. If requested by the City, I/we would be prepared to enter into that Agreement, amended by the following departures (list, if any):

Section	Requested Departure(s) / Alternative(s)

4. The Contractor acknowledges that the departures it has requested in Sections 3 of this Quotation will not form part of the Agreement unless and until the City agrees to them in writing by initialing or otherwise specifically consenting in writing to be bound by any of them.

5. The Contractor offers to supply and deliver to the City of Surrey the Good for the prices set out below plus applicable environmental levies and taxes as follows:

A. PURCHASE PRICE

In accordance with the Contract Documents, which terms and conditions I/we have carefully examined and agree to, the undersigned hereby submits a firm Quotation for the design, construction and delivery of the vehicle(s) in accordance with the Specifications for the price(s) as listed below, delivered F.O.B. City of Surrey, Fire Hall #9, Mechanical Division, 14901 – 64th Avenue, Surrey, British Columbia, V3S 1X8, Canada.

The following price(s) include and covers all duties, taxes, handling and transportation charges, and all other charges incidental to and forming part of this Quotation. The Contractor shall be responsible for customs clearance and payment of any duties and/or taxes owing at time of importation into Canada, as applicable.

Year, Make & Model: _____

SUPPLY AND DELIVERY OF ONE ONLY 100 FT. MID-MOUNT TOWER FIRE APPARATUS

PARTICULARS	PURCHASE PRICE
PRICE PER UNIT:	\$ _____
Province of B.C. ENVIRONMENTAL LEVY (Lead Acid Batteries):	\$ _____
Province of B.C. Advance Disposal Fee (Tires):	\$ _____
Air Conditioning Surcharge:	\$ _____
Other Fees/Levies (please state):	
(a)	\$ _____
(b)	\$ _____

GST: (5%) on \$ _____

PST: (7%) on \$ _____

\$ _____

TOTAL QUOTATION PRICE:

\$ _____

ALL PRICING IN CANADIAN DOLLARS.

B. OPTIONAL WORK:

The following is a list of Optional Work. Optional work may be included in the supply and delivery of the Good at the sole discretion of the City. Plus applicable taxes.

Line Item	Description	Price
OP-1	Directional Lighting LED – Option 1:	\$
OP-2"	Directional Lighting LED – Option 2:	\$
OP-3	Directional Lighting LED – Option 2:	\$
Other (State)		\$

OP-1 Refer to the Schedule B-1- Technical and Functional Specifications Response Matrix Response form worksheets, Section (VIII) Lighting Systems, sub-section 3.11;

OP-2 Refer to the Schedule B-1 - Technical and Functional Specifications Response Matrix Response form worksheets, Section (VIII) 3.12 under "Lighting Systems; and

OP-3 Refer to the Schedule B-1 - Technical and Functional Specifications Response Matrix Response form worksheets, Section (XIV). sub-section 5.01 under "Options and Requirements"

C. PRICING FOR PRE-PRODUCTION MEETING AND FACTORY INSPECTIONS

The following tables are a list of optional price(s) to the work and forms part of this RFQ, upon the acceptance of any or all of the optional prices(s). The optional prices are an addition to the Total Quotation Price and do not include applicable taxes. DO NOT state a revised Total Quotation Price.

Pricing for in-person options should include all costs for travel (commercial transportation [i.e., airfare] to and from Surrey, British Columbia to meeting/manufacture site and local travel [to and from airport]), meals and accommodation and hosting two (2) Surrey Fire Department Representatives, for three (3) individual and consecutive eight (8) hour days dedicated to meeting and inspection meetings as set out in Schedule B – Form of Agreement. It is preferred that a minimum of three (3) weeks' advance notice be provided to the Fire Department representative(s) to allow for proper arrangements to be made.

Table 1 – Pre-Production Meeting (Refer to Section 25 of the Agreement of additional information)		
Description	Option A: Price for In-Person Meeting	Option B: Price (if any) for Video conference
Pre-Production meeting held at a designated City facility in accordance with the provisions as set out in Section 25. of the Agreement.	\$	\$

Table 2 – Factory Inspections #1 through #3 (Refer to Sections 39 of the Agreement for additional information. Additionally, refer to Schedule B-1 – Technical and Functional Specifications/Response Matrix.)		
Description	Option A: Price for In-Person Meeting¹	Option B: Price (if any) for Photo inspections only
Inspection #1 – Inspection of Cab, Chassis and Main Fire Pump. Price to include three (3) days of dedicated cab, chassis and main fire pump inspection meeting time, for the attendance of two (2) Fire Department representatives (not including travel time).	\$	\$
Inspection #2 – Inspection of pump installation, all plumbing, and structural body installed, and, primed and ready for paint. Price to include three (3) days of dedicated cab, chassis and main fire pump inspection meeting time, for the attendance of two (2) Fire Department representatives (not including travel time).	\$	\$
Inspection #3 – Pre-Delivery. Price to include three (3) of dedicated cab, chassis and main fire pump inspection meeting time, for the attendance of two (2) Fire Department representatives (not including travel time).	\$	\$

Table 3 – In Person Third Party Factory Inspection	
Description	Price for Third Party Inspection
For Inspection #3 – Includes photographs and detailed inspection documents, and an inspection completed at the Contractor’s plant by an independent party.	\$

D. SUPPLY AND DELIVERY OF GOOD

The Contractor will supply and deliver the Goods that meet the specifications and requirements set out in Schedule A – Specifications of Goods of the Agreement. The Contractor will complete and deliver to the Delivery Point the Good in accordance with the following schedule.

	<u>Completion Date</u>	<u>Delivery Date</u>
Fire Apparatus	_____	_____

Note: While the City anticipates purchasing a Good, there is no guarantee of any volume of purchase.

E. PAYMENT TERMS:

A cash discount of _____ % will be allowed if the invoices is paid within _____ days, or the ____ day of the month following, or net 30 days, on a best effort basis.

Technical and Functional Specifications / Requirements Response

6. I/We have reviewed the RFQ Attachment 1 – Draft Quotation Agreement – Goods, Schedule A – Specifications of Goods including Parts I & II. The Contractor should set out in its Quotation in detail how its proposed technical and functional solution meets the technical and functional specifications/requirements of RFQ Attachment 1 – Draft Quotation Agreement – Goods, including Part I & II. Any variance from those technical and functional specifications/requirements should be clearly pointed out by the Contractor in its Quotation, including where conflicts may exist between the Contractor’s proposed solution and the technical and functional specifications/requirements as described therein.

Contractors should complete and include with their Quotation the City’s Schedule B-1 – Technical and Functional Specifications / Requirements Response Matrix response Form worksheets.

The Schedule B-1 – Technical and Functional Specifications / Requirements Matrix may be viewed and/or downloaded from the City of Surrey’s Managed File Transfer Service (MFT) link noted below. Printing will be the sole responsibility of the Contractor.

In the URL, or address field at the top, enter the following address: <https://mft.surrey.ca/> and hit “enter”.

Enter “surreybid” as the User Name, “Welcome” as the password and then click “Login”

<https://mft.surrey.ca/>

Login ID: surreybid

Password: Welcome

Locate Folder: 1220-040-2024-032

7. Each Quotation should be accompanied by a set of "Contractor's Specifications" consisting of a detailed description of the Good proposed and to which Good should conform. Computer run-off sheets are not acceptable as descriptive literature. The specifications should indicate size, type, model and make of all component parts and equipment.

Indicative Design Submittal

8. Each Quotation should be accompanied by an indicative design. The indicative design should represent a full size, conceptual, blueprint type of drawings and detailed engineering drawings of the Goods, representing a level of design sufficient to enable a thorough evaluation of the Contractor’s design concepts. Such drawings should be drawn to scale using a CAD program to ensure accurate and professional drawings.

These drawings should address following views:

- (i) top view (entire truck);
- (ii) front end view;
- (iii) rear end view;
- (iv) left side view;
- (v) right side view; and

Contractor should:

- (a) show the overall dimensions and configuration of the Goods and the arrangement of compartments and equipment storage;
- (b) be consistent with the technical and functional requirements set out in Part II Schedule A – Specifications of Goods;
- (c) clearly indicate, to scale, all exterior portions of the Goods, including controls, lights, railings, gauges, etc.; and
- (d) provide a narrative that further describes the key features and innovative aspects of the Contractor’s design concept.

Experience, Reputation and Resources:

9. Contractor’s relevant experience and qualifications in delivering the Goods similar to those required by the RFQ:

10. Contractor should describe the level of research and development investment you make in your products:

11. Performance History. Provide the number of Goods similar to the proposed model delivered in the past five years, including timeframes for delivery. Provide a copy of recall notices and Fleet Defects issued for the proposed model during the previous five years along with the number of affected Goods in service.

12. Key Personnel: Contractors should identify and provide the background and experience for the key personnel that would perform the Contractor’s work, outlining their intended roles in meeting the requirements. If appropriate, also include a complete organization chart, identifying all roles and areas of responsibility.

Preference may be given to a Contractor and proposed personnel that demonstrate knowledge and experience involving the successful design, development and manufacturing goods similar to the Goods. Each Contractor should make clear in its Quotation its relevant knowledge and experience, and that of its proposed key personnel. Without limiting the foregoing, each Contractor should provide copies of Emergency Vehicle Technician (EVT) certifications for its current staff of technicians at its service center.

13. Contractor should provide the background and experience of all sub-contractors and material suppliers proposed to undertake a portion of the Good (use the spaces provided and/or attach additional pages, if necessary):

DESCRIPTION OF WORK	SUB-CONTRACTOR'S NAME	YEARS WORKING WITH SUB-CONTRACTOR	TELEPHONE NUMBER AND EMAIL

14. Operational Facility: Contractors should provide satisfactory evidence that it has an operational facility adequate for the manufacture of the Goods that it intends to furnish, as well as documented experience of construction of multiple goods similar to those which are the subject of the Quotation and their successful operation for periods of years. (It is the intention of the City to purchase heavy duty fire apparatus of proven design, and not prototypes.)
-
-

15. Contractors should provide references (name, telephone number) (use the spaces provided and/or attach additional pages, if necessary). The City's preference is to have a minimum of three references. Previous clients of the Contractor may be contacted at the City’s discretion.
-
-

Preliminary Production and Delivery Schedule:

- 16. Contractors should provide for the Good a preliminary production schedule and delivery schedule, with committed timelines for the construction of the Good with a delivery date at the Delivery Point. It is preferred that the preliminary production schedule be prepared in the form of a Gantt Chart or in a similar format.

Training and Support Services, On-Call Support and On-Site Service, Parts Support and Warranty:

- 17. Training and Support Services. (Refer to Sections 46 through 54 of Schedule A – SPECIFICATIONS OF GOODS. Contractor should provide a description of the general approach and methodology that the Contractor would take in performing the training and support services described in the Agreement:

- 18. On-Call Support and On-Site Service.

- (a) What technical and engineering support could the Contractor provide to the City? Please include location these services will be provided and how the City’s needs will be addressed in critical times. Please include the breadth and depth of this support.

- (b) What technical and engineering support could be provided by original equipment manufacturers (OEM) that supports the major components in each Good (e.g., engine, transmission, chassis, wiring)? Please provide letters of assurance from OEM’s, if possible.

- (c) What and how would technical liaison and field services will be supplied to the City by the Contractor?

- (d) How field service team member’s abilities, experience, and qualifications could meet the City’s expectation of a high level of support? Contractor should provide an organizational chart showing current BC based personnel names and titles.

19. Replacement Parts Support:

(Refer to Sections 85 through 87 of the Agreement.)

Contractor should:

- (a) Identify the location of the parts provider the Contractor now maintains or agrees to establish and the hours of operation. Please identify the parts providers that OEM suppliers of major components within North America that will support the supply chain of components on the Goods.

- (b) Describe how the Contractor's parts supply team member's abilities, experience and qualifications will meet the City's expectation of high level of support.

- (c) State what parts of engine, transmission, running gear, chassis, body and equipment the Contractor will carry in its parts service centre or directly supported through a North American supply chain by other parties or Original Equipment Manufacturers.

20. Warranty. Contractor should provide information on its ability to meet the warranty terms set forth in the Agreement and specify any warranties in addition to those provided in Attachment 1 – Quotation Agreement - Goods. Contractor should submit with its Quotation a detailed program for in-house warranty work to be performed by the City's Fire Services mechanical division staff with the Contractor reimbursing the City for all expenses and supply whatever parts, assemblies, systems, etc., that are necessary to complete the repairs.

Contractor should complete and include with their Quotation the City's Schedule B-2 Additional Warranty Response Matrix worksheets.

The Additional Warranty Response Matrix worksheets may be viewed and/or obtained at the Managed File Transfer Service (MFT) link noted below. Printing will be the sole responsibility of the Contractor.

Schedule B-2 may be viewed and/or downloaded from the City of Surrey’s Managed File Transfer Service (MFT):

In the URL, or address field at the top, enter the following address: <https://mft.surrey.ca/> and hit “enter”.

Enter “surreybid” as the User Name, “Welcome” as the password and then click “Login”

<https://mft.surrey.ca/>

Login ID: surreybid
Password: Welcome
Folder: 1220-040-2024-032

21. I/We the undersigned duly authorized representatives of the Contractor, having received and carefully reviewed the RFQ including without limitation the draft Agreement submit this Quotation in response to the RFQ.

This Quotation is offered by the Contractor this _____ day of _____, 2024.

CONTRACTOR

I/We have the authority to bind the Contractor:

(Legal Name of Contractor)

(Signature of Authorized Signatory)

(Print Name and Position of Authorized Signatory)

(Signature of Authorized Signatory)

(Print Name and Position of Authorized Signatory)