



CITY OF SAN ANTONIO
Finance Department, Purchasing Division

REQUEST FOR OFFER (“RFO”) NO.: 6100017697

FOAM ENHANCED PUMPER TRUCK

Date Issued: JANUARY 12, 2024

RESPONSES MUST BE RECEIVED **NO LATER** THAN:
10:00 AM, CENTRAL TIME, JANUARY 22, 2024

Responses may be submitted by any of the following means:

Electronic submission through the Portal
Electronic submission by e-mail

Bid Bond: None Performance Bond: None Payment Bond: None Other: None

See Supplemental Terms & Conditions for information on these requirements.

Affirmative Procurement Initiative: None DBE / ACDBE Requirements: None

See Instructions for Offerors and Attachments sections for more information on these requirements.

Pre-Submittal Conference: None

Staff Contact Person:

Jody De La Rosa

Procurement Specialist II

Email: jody.delarosa@sanantonio.gov

Phone Number: 210-207-0543

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003 - INSTRUCTIONS FOR OFFERORS

Submission of Offers.

Submission of Offer's. ***Offer(s) maybe submitted through the Portal or by E-mail**

Submission of Electronic Offer's. Submit one offer electronically by the due date provided on the Cover Page. All times stated herein are Central Time. Any offer or modification received after the time and date stated on the Cover Page shall be rejected. All forms in this solicitation which require a signature must have a signature affixed thereto, either by manually signing the document, prior to scanning it and uploading it with your submission, or affixing it electronically.

Submission of Offers by Email. Submit one document by email to the Staff Contact Person, by the due date provided on the Cover Page. All times stated herein are Central Time. Any offer or modification received after the time and date stated on the Cover Page shall be rejected.

Modified Offer. Offer's may be modified provided such modifications are received prior to the time and date set for submission of Offer, and submitted in the same manner as original offer "**electronically**". Electronic offer's, a modified offer will automatically replace a prior offer submission. See below for information on submitting Alternate Offer's.

City shall not be responsible for lost or misdirected offers or modifications.

For electronic offers, Offeror's electronic submission, with accompanying affirmations, constitutes a binding signature for all purposes.

Offerors are cautioned that they are responsible for the security of their log on ID and password, since unauthorized use could result in Offeror's being held liable for the submission.

Certified Vendor Registration Form. If Offeror has not completed the City's Certified Vendor Registration (CVR) Form, Offeror is required to do so prior to the due date for submission of offers. The CVR form may be accessed at <http://www.sanantonio.gov/purchasing/>. Offerors must identify the correct name of the entity that will be providing the goods and/or services under the contract. No nicknames, abbreviations (unless part of the legal title), shortened or short-hand names will be accepted in place of the full, true and correct legal name of the entity.

Alternate Offers. Alternate offers may be allowed at the sole discretion of City.

Electronic Alternate Offers Submitted Through the Portal. All alternate offers are recorded with original offers when submitted electronically.

Catalog Pricing. (This section applies to offers using catalog pricing, unless this is a cooperative purchase.)

The offer will be based on manufacturer's latest dated price list(s). Said price list(s) must denote the manufacturer, latest effective date and price schedule.

Offerors shall be responsible for providing one copy of the manufacturer's catalog for each manufacturer for which an offer is submitted. Offeror shall provide said catalog at the time of submission of its offer. Manufacturers' catalogs may be submitted in any of the following formats: paper copy or CD ROM for offer(s) submitted on paper, or PDF file for offers submitted electronically.

Offerors may submit price lists other than the manufacturer's price list. Said price list(s) must denote the company name, effective date and price schedule. These price lists are subject to approval of the City Finance Department-Purchasing Division.

Specified items identified herein, if any, are for overall offer evaluation and represent the commonly and most used items. Net prices entered for those specified items must reflect the actual price derived from quoted price list less all discounts offered.

Restrictions on Communication.

Offers are prohibited from communicating with: 1) City officials, as defined by §2-62 of the City Code of the City of San Antonio, regarding the RFO or offers from the time the RFO has been released until the contract is posted for consideration as a City Council agenda item during a meeting designated as an "A" session; and 2) City employees from

the time the RFO has been released until the contract is awarded. These restrictions extend to “thank you” letters, phone calls, emails and any contact that results in the direct or indirect discussion of the RFO and/or offer submitted by offeror. Violation of this provision by offeror and/or its agent may lead to disqualification of Offeror’s offer from consideration.

Exceptions to the restrictions on communication with City employees include:

Offerors may ask verbal questions concerning this RFO at the Pre-Submittal Conference.

Offerors may submit written questions, or objections to specifications, concerning this RFO to the Staff Contact Person listed on the Cover Page on or before one calendar days prior to the date offers are due. Questions received after the stated deadline will not be answered. Questions submitted and the City’s responses will be posted with this solicitation. All questions shall be sent by e-mail or through the portal.

Offerors may provide responses to questions asked of them by the Staff Contact Person after responses are received. The Staff Contact Person may request clarification to assist in evaluating the Offeror’s response. The information provided is not intended to change the offer response in any fashion. Such additional information must be provided within two business days from City’s request.

Offerors and/or their agents are encouraged to contact the Small Business Office of the International and Economic Development Department for assistance or clarification with issues specifically related to the City’s Small Business Economic Development Advocacy (SBEDA) Program policy and/or completion of the SBEDA form (s), if any. The point of contact is identified on the Cover Page. Contacting the Small Business Office regarding this RFO after the due date is not permitted. If this solicitation contains Affirmative Procurement Initiatives, it will be noted on the Cover Page.

If this solicitation contains DBE/ACDBE requirements, offeror and/or their agents may contact the Aviation Department’s DBE/ACDBE Liaison Officer for assistance or clarification with issues specifically related to the DBE/ACDBE policy and/or completion of the required form(s). Point of contact is Ms. Barbara Patton, who may be reached via telephone at (210) 207-3592 or through e-mail at Barbara.Patton@sanantonio.gov. Offerors and/or their agents may contact Ms. Patton at any time prior to the due date for submission of offer. Contacting her or her office regarding this RFO after the offer due date is not permitted. If this solicitation contains DBE/ACDBE requirements, it will be noted on the Cover Page.

Pre-Submittal Conference.

If a Pre-Submittal Conference is scheduled, it will be held at the time and place noted on the Cover Page. Offerors are encouraged to prepare and submit their questions in writing in advance of the Pre-Submittal Conference in order to expedite the proceedings.

Pre-Submittal Conference participation is optional, but highly encouraged.

Respondents who join the WebEx Pre-Bid Conference are highly encouraged to email the solicitation’s Staff Point of Contact confirming Respondent attendance and participation through the WebEx.

Any oral response given at the Pre-Bid Conference that is not confirmed in writing and posted with this solicitation shall not be official or binding on the City.

To request an interpreter for the deaf or other assistance, call (210) 207-7245 Voice/TTY. Interpreters for the deaf must be requested at least 48 hours prior to the meeting.

Changes to RFO.

Changes to this RFO made prior to the offer due date shall be made directly to the original RFO. Changes are captured by creating a replacement version each time the RFO is changed. It is Offeror’s responsibility to check for new versions until the offer due date. City will assume that all offers received are based on the final version of the RFO as it exists on the day offers are due.

No oral statement of any person shall modify or otherwise change or affect the terms, conditions or specifications stated in the RFO.

Preparation of Offers.

All information required by the RFO must be furnished or the offer may be deemed non-responsive and rejected. Any ambiguity in the offer as a result of omission, error, unintelligible or illegible wording shall be construed in the favor of City.

Correct Legal Name. If an Offeror is found to have incorrectly or incompletely stated the name of the entity that will provide goods and/or services, the offer may be rejected.

Line Item Offers. Any offer that is considered for award by each unit or line item must include a price for each unit or line item for which Offeror wishes to be considered. All offers are awarded on the basis of low line item, low total line items, or in any other combination that serves the best interest of City, unless City designates this solicitation as an "all or none" offer in the Supplemental Terms & Conditions.

All or None Offers. Any offer that is considered for award on an "all or none" basis must include a price for all units or line items. In an "All or None" offer, a unit price left blank shall result in the offer being deemed nonresponsive and disqualified from consideration. An "All or None" offer is one in which City will award the entire contract to one offeror only.

Delivery Dates. Proposed delivery dates must be shown in the offer form where required and shall include weekends and holidays, unless specified otherwise in this RFO. Proposed delivery times must be specific. Phrases such as "as required", "as soon as possible" or "prompt" may result in disqualification of the offer. Special delivery instructions, if any, may be found in the Specifications / Scope of Services section of this document, or in the Purchase Order.

Tax Exemption. The City of San Antonio is exempt from payment of federal taxes, and State of Texas limited sales excise and use taxes. Offerors must not include such taxes in offer prices. An exemption certificate will be signed by City where applicable upon request by Offeror after contract award.

Samples, Demonstrations and Pre-award Testing. If requested by City, Offeror shall provide product samples, demonstrations, and/or testing of items offered to ensure compliance with specifications prior to award of the contract. Samples, demonstrations and/or testing must be provided within 7 calendar days of City's request. Failure to comply with City's request may result in rejection of an offer. All samples (including return thereof), demonstrations, and/or testing shall be at Offeror's expense. Samples will be returned upon written request. Requests for return of samples must be made in writing at the time the samples are provided. Otherwise, samples will become property of City at no cost to City. Samples that are consumed or destroyed during demonstrations or testing will not be returned.

Estimated Quantities for Annual Contracts.

Designation as an "annual" contract is found in the contract's title on the Cover Page of this document. The quantities stated are estimates only and are in no way binding upon City. Estimated quantities are used for the purpose of evaluation. City may increase or decrease quantities as needed. Where a contract is awarded on a unit price basis, payment shall be based on the actual quantities supplied.

Offerors shall thoroughly examine the drawings, specifications, schedule(s), instructions and all other contract documents.

Offerors shall make all investigations necessary to thoroughly inform themselves regarding plant and facilities for delivery of material and equipment, or conditions and sites/locations for providing goods and services as required by this RFO. No plea of ignorance by Offeror will be accepted as a basis for varying the requirements of City or the compensation to Offeror.

Confidential or Proprietary Information. All offers become the property of City upon receipt and will not be returned. Any information deemed to be confidential by Offeror should be clearly noted; however, City cannot guarantee that it will not be compelled to disclose all or part of any public record under the Texas Public Information Act, since information deemed to be confidential by Offeror may not be considered confidential under Texas law, or pursuant to a Court order. Pricing may be tabulated and posted to City's website, so shall not be considered proprietary or confidential.

Costs of Preparation. Offeror shall bear any and all costs that are associated with the preparation of the Offer, attendance at the Pre-Submittal conference, if any, or during any phase of the selection process.

Rejection of Offers.

City may reject any and all offers, in whole or in part, cancel the RFO and reissue the solicitation. City may reject an offer if:

Offeror misstates or conceals any material fact in the offer; or

The offer does not strictly conform to law or the requirements of the offer;

The offer is conditional; or

Any other reason that would lead City to believe that the offer is non-responsive or Offeror is not responsible.

City, in its sole discretion, may also waive any minor informalities or irregularities in any offer, such as failure to submit sufficient offer copies, failure to submit literature or similar attachments, or business affiliation information.

Changes to Offer Form. Offers must be submitted on the forms furnished. Offers that change the format or content of City's RFO may be rejected.

Withdrawal of Offers. Offers may be withdrawn prior to the due date. Offers submitted electronically may be withdrawn electronically.

Evaluation and Award of Contract.

City reserves the right to make an award on the basis of City's best interests. Award may also be made based on low line item, low total line items, or in any other combination that serves the best interest of City, unless City designates this solicitation as an "all or none" offer in the Supplemental Terms & Conditions.

A written award of acceptance, manifested by a City Ordinance, and a purchase order furnished to Offeror results in a binding contract without further action by either party. Offeror must have the Purchase Order before making any delivery.

City reserves the right to delete items prior to the awarding of the contract, and purchase said items by other means.

Inspection of Facilities/Equipment. Depending on the nature of the RFO, Offerors' facilities and equipment may be a determining factor in making the offer award. All Offerors may be subject to inspection of their facilities and equipment.

Prompt Payment Discount.

Provided Offeror meets the requirements stated herein, City shall take Offeror's offered prompt payment discount into consideration. The evaluation will not be based on the discount percentage alone, but rather the net price as determined by applying the discount to the offer price, either per line item or total offer amount. However, City reserves the right to reject a discount if the percentage is too low to be of value to City, all things considered. City may also reject a discount if the percentage is so high as to create an overly large disparity between the price City would pay if it is able to take advantage of the discount and the price City would pay if it were unable to pay within the discount period. City may always reject the discount and pay within the 30 day period, at City's sole option.

City will not consider discounts that provide fewer than 10 days to pay in order to receive the discount.

For example, payment terms of 2% 5, Net 30 will NOT be considered in offer evaluations or in the payment of invoices. However, payment terms of 2% 10, Net 30 will result in a two percent reduction in the offer price during offer evaluation, and City will take the 2% discount if the invoice is paid within the 10 day time period.

Prohibited Financial Interest.

The Charter of the City of San Antonio and the City of San Antonio Code of Ethics prohibit a City officer or employee, as those terms are defined in the Code of Ethics, from having a direct or indirect financial interest in any contract with City. An officer or employee has a "prohibited financial interest" in a contract with City or in the sale to City of land materials, supplies or service, if any of the following individual(s) or entities is a party to the contract or sale:

- A City officer or employee; his or her spouse, sibling, parent, child, or other family member within the first degree of consanguinity or affinity;

- An entity in which the officer or employee, or his or her parent, child or spouse directly or indirectly owns (i) 10% or more of the voting stock or shares of the entity, or 10% or more of the fair market value of the entity; or
- An entity in which any individual or entity listed above is (i) a subcontractor on a City contract, (ii) a partner or (iii) a parent or subsidiary entity.

By submitting a proposal, Respondent warrants and certifies, and a contract awarded pursuant to this RFO is made in reliance thereon, that it, its officers, employees and agents are neither officers nor employees of the City.

State of Texas Conflict of Interest:

Questionnaire (Form CIQ). Chapter 176 of the Texas Local Government Code requires that persons, or their agents, who seek to contract for the sale or purchase of property, goods, or services with the City, shall file a completed Form CIQ with the City Clerk if those persons meet the requirements under 176.006(a) of the statute.

By law this questionnaire must be filed with the City Clerk not later than the 7th business day after the date the vendor becomes aware of facts that require the statement to be filed. See Section 176.006(a-1), Texas Local Government Code.

Form CIQ is available from the Texas Ethics Commission by accessing the following web address:

<https://ethics.state.tx.us/forms/conflict/>

In addition, please complete the **City's Addendum to Form CIQ (Form CIQ-A)** and submit it with Form CIQ to the Office of the City Clerk. The Form CIQ-A can be found at:

<http://www.sanantonio.gov/atty/ethics/pdf/OCC-CIQ-Addendum.pdf>

When completed, the CIQ Form and the CIQ-A Form should be submitted together by mail to the Office of the City Clerk. Please mail to:

Office of the City Clerk, P.O. Box 839966, San Antonio, TX 78283-3966.

Do not include these forms with your offer. The Purchasing Division will not deliver the forms to the City Clerk for you.

004 - SPECIFICATIONS / SCOPE OF SERVICES

- 4.1 BACKGROUND:** The City of San Antonio is soliciting an offer from Siddons Martin Emergency Group to furnish one Pierce Velocity Class B Foam Pumper. This unit will replace #8952 – 2010 PIERCE QUANTUM, VIN#4P1CU01H1AA010996.
- 4.2 GENERAL CONDITIONS:** The following general conditions will apply to all items within this bid unless specifically excluded within any item.
- 4.2.1** City of San Antonio reserves the right to increase or decrease quantity of units being purchased up to the production “cut-off” date submitted on the bid for the particular item, depending on availability of funds. Prices may not be increased during this period; however, the City should benefit from any price decrease. Additional units may be purchased on an “as needed” basis. Successful vendor is required to notify the City of all production “cut-off” dates necessary for order submission. Vehicles shall be year model 2024 or newer.
- 4.2.2** All components shall be installed new, unused, standard production model, and equipment must be serviced in accordance with manufacturer’s recommended pre-delivery check list, and ready for operation upon delivery, and shall include all manufacturers’ standard equipment unless otherwise specified or replaced therein. Equipment offered under the below listed specifications will be considered unacceptable if for any reason its long-term availability on the U.S. Market or in the local area is in doubt.
- 4.3 DELIVERY:** The apparatus will be delivered under its own power to insure proper break-in of all components while the apparatus is still under warranty. All vehicle and title deliveries are to be made to:
- City of San Antonio
Building & Equipment Services
Southeast Service Center
1318 SE Loop 410, Building 6, Gate 5
San Antonio, TX 78220
- Vendor must contact the Fleet Acquisitions at (210) 207-4603 or (210) 207-4601 prior to delivery. Delivery to a non-specified location will result in non-acceptance of the equipment by the City. All deliveries must be pre-arranged with a minimum 24-hour notification, NO EXCEPTIONS. Vehicles will not be accepted after 3:00 P.M. CST. All vehicles are required to have a full tank(s) of fuel when delivered to City specified location.
- 4.4 REQUIRED DOCUMENTS AT DELIVERY:** The Manufacturer’s Statement of Origin (MSO), Dealer Temporary license plates/tags, proper Invoice, signed 130U form, Vehicle Inspection Report, and State Weight Certificate/slip (for trucks over one ton) are required upon delivery of each unit and are required before payment can be processed. Any of these missing items will delay the payment process.
- 4.5 INCOMPLETE VEHICLES:** All bodies and components in this bid will be installed in accordance with the appropriate Incomplete Vehicle Data Manual. Certification of compliance will be posted on the left door post of the vehicle. Except for manufacturer’s data plates (maximum 4” x 6”), vendor’s or manufacturer’s identifying markings (decals and plates) will not be applied to the vehicle or mounted components. Installation will be completed in compliance with Federal Motor Vehicle Department of Transportation Standards and Texas State Highway requirements. Installation of body and accessories on City furnished vehicles will be accomplished by drilling holes in the frame. Welding on or cutting of frame is not authorized forward of the rear spring hanger or support. Bidders will be responsible for the relocation of any truck components to facilitate installation of the body and equipment. Such relocation must be included as part of the basic bid.
- 4.6 BUILD SHEET INSTRUCTIONS:** Upon contract award, vendor shall provide written acknowledgement of order placement. A copy of the finalized build sheet with a San Antonio Fire Department Representative signature confirming equipment build out shall be provided to the City prior to equipment delivery. The delivery date for the completed unit shall be communicated when the build sheet is finalized. Electrical wiring schematics that include lighting and air conditioning systems for body shall be provided at time of delivery. Electrical wiring schematics and finalized build sheet shall be provided in paper in Adobe PDF format.
- 4.7 VEHICLE INSPECTION:** The vendor shall have each vehicle (except cab and chassis units delivered without bodies) properly inspected in compliance with Texas motor vehicle laws.

- 4.7.1 CHECK-IN INSPECTION:** The City shall check the vehicle upon delivery to ensure compliance with this specification and any other specific requirements. The vendor shall deliver with the vehicle a manufacturer's invoice, and MSO or any official documentation to verify the fact that ordered options, GVWR rating, and other requirements have been met. Failure to provide required documentation as listed may cause the delay of payment. Payment will be made within 30 days after vehicle's acceptance or receipt of correct invoice, whichever is later. Acceptance will not be made, nor payment initiated on vehicles failing to meet specifications (unless they are brought into full compliance), and all necessary documents (i.e., MSO, odometer statement, etc.) are received by the City.
- 4.7.2** The City shall have a maximum of 30 working days to complete this inspection.
- 4.8 NON-COMPLIANT VEHICLES:** Vendor shall remove noncompliant vehicle(s) from City premises within 5 working days after receiving written notification from Fleet Acquisition staff. If vehicle is not removed by vendor within the specified time frame, the City may arrange for vehicle to be removed and secured by a local towing and storage facility. Vendor will be responsible for payment of all related towing and storage charges. The City will not be responsible or liable for damage or loss of noncompliant vehicles which remain on City premises, or which are removed by towing company, 5 working days after vendor notification.
- 4.9 BRAND NAMES:** Manufacturer names, trade names, brand names, and product numbers used herein are for the purpose of describing and establishing tested, compatible, approved and acceptable products that are of the type and quality required by the City. For purposes of this contract, the proposed "or equal" products shall require close adherence to the established standards of performance and quality inherently derived and reasonably expected from the brand-named products specified herein. The City shall be the sole judge of equality and suitability.
- 4.10 INFORMATION:** a permanent plate will be mounted by vendor in the driver's compartment specifying the quantity and type of fluids required including engine oil, engine coolant, transmission, pump transmission lubrication, pump primer and drive axle.
- 4.11 SAFETY VIDEO** - At the time of delivery Pierce will also provide one professionally produced apparatus safety video, in DVD format or online video access. This video will address key safety considerations for personnel to follow when they are driving, operating, and maintaining the apparatus, including the following: vehicle pre-trip inspection, chassis operation, pump operation, aerial operation, and safety during maintenance.
- 4.12 PERFORMANCE TESTS** - A road test will be conducted by the manufacturer with the apparatus fully loaded and a continuous run of no less than ten (10) miles. During that time the apparatus will show no loss of power, nor will it overheat. The transmission drive shaft or shafts and the axles will run quietly and be free of abnormal vibration or noise. The apparatus when fully loaded will not have less than 25 percent nor more than 50 percent on the front axle, and not less than 50 percent nor more than 75 percent on the rear axle. The apparatus will meet NFPA 1901 acceleration and braking requirements.
- 4.13 SERVICE AND WARRANTY SUPPORT** - Pierce dealership support will be provided by Siddons Martin Emergency Group by operating a Pierce authorized service center. The service center will have factory-trained mechanics on staff versed in Pierce fire apparatus. The service facility will be located within twenty-five (25) miles of the fire department. A manufacturer's website that will allow the ability to view the complete bill of materials for the specific apparatus, including assembly drawings, piece part drawings, and beneficial parts notations must be accessible for each apparatus. Published component catalogs, which include proprietary systems along with an extensive operator's manual library, must be available for easy reference.
- 4.14 SPECIAL INSTRUCTIONS-** The apparatus being proposed will be designed and built to match previous units, 31672, 32239 and 30782. However, some variation may be necessary due to changes in manufacturing processes or product offering. Revisions in NFPA guidelines and/or other regulations may also affect the ability to match the previous units.
- 4.15 NFPA 2016 STANDARDS-** This unit will comply with the NFPA standards effective January 1, 2016, except for fire department directed exceptions. These exceptions will be set forth in the Statement of Exceptions. Certification of slip resistance of all stepping, standing and walking surfaces will be supplied with delivery of the apparatus.
- 4.15.1** All horizontal surfaces designated as a standing or walking surface that are greater than 48.00" above the ground must be defined by a 1.00" wide line along its outside perimeter. Perimeter markings and designated access paths to destination points will be identified on City approval print and are shown as approximate. Actual location(s) will be determined based on materials used and actual conditions at final

build. Access paths may pass through hose storage areas and opening or removal of covers or restraints may be required. Access paths may require the operation of devices and equipment such as the aerial device or ladder rack.

- 4.15.2 A plate that is highly visible to the driver while seated will be provided. This plate will show the overall height, length, and gross vehicle weight rating.
- 4.15.3 The manufacturer will have programs in place for training, proficiency testing and performance for any staff involved with certifications.
- 4.15.4 An official of the company will designate, in writing, who is qualified to witness and certify test results.
- 4.16 **NFPA COMPLIANCY** - Apparatus proposed by the bidder will meet the applicable requirements of the National Fire Protection Association (NFPA) as stated in current edition at time of contract execution. Fire department's specifications that differ from NFPA specifications will be indicated in the proposal as "non-NFPA".
- 4.17 **VEHICLE INSPECTION PROGRAM CERTIFICATION** - To assure the vehicle is built to current NFPA standards, the apparatus, in its entirety, will be third-party, audit-certified through Underwriters Laboratory (UL) that it is built and complies to all applicable standards in the current edition of NFPA 1901. The certification will include: all design, production, operational, and performance testing of not only the apparatus, but those components that are installed on the apparatus.
- 4.18 A placard will be affixed in the driver's side area stating the third-party agency, the date, the standard and the certificate number of the whole vehicle audit.
- 4.19 **PUMP TEST** - Underwriters Laboratory (UL) will test, approved, and certify the pump. The test results and the pump manufacturer's certification of hydrostatic test; the engine manufacturer's certified brake horsepower curve; and the pump manufacturer's record of pump construction details will be forwarded to the Fire Department.
- 4.20 **APPROVAL DRAWING** - A drawing of the proposed apparatus will be prepared and provided to the purchaser for approval before construction begins. The Pierce sales representative will also be provided with a copy of the same drawing. The finalized and approved drawing will become part of the contract documents. This drawing will indicate the chassis make and model, location of the lights, siren, horns, compartments, major components, etc.
- 4.21 A "revised" approval drawing of the apparatus will be prepared and submitted by Pierce to the City showing any changes made to the approval drawing.
- 4.22 **ELECTRICAL WIRING DIAGRAMS** - One (1) CD copy or USB DRIVE and one (1) paper copy of the electrical wiring diagrams, prepared for the model of chassis and body, will be provided.

4.23

ITEM	QUANTITY	DESCRIPTION
1	1	Foam Enhanced Pumper Truck

- 4.24 **VELOCITY CHASSIS** - Chassis provided will be a new, tilt-type custom fire apparatus. The chassis will be manufactured in the apparatus body builder's facility eliminating any split responsibility. The chassis will be designed and manufactured for heavy-duty service, with adequate strength and capacity for the intended load to be sustained and the type of service required. The chassis will be the manufacturer's first line tilt cab.
- 4.25 **WHEELBASE** - The wheelbase of the vehicle will be 239.00".
- 4.26 **GVW RATING** - The gross vehicle weight rating will be 49,800 lbs.
- 4.27 **FRAME** - The chassis frame will be built with two (2) steel channels bolted to five (5) cross members or more, depending on other options of the apparatus. The side rails will have a 13.38" tall web over the front and mid sections of the chassis, with a continuous smooth taper to 10.75" over the rear axle. Each rail will have a section modulus of 25.992 cubic inches and a resisting bending moment (rbm) of 3,119,040 in-lb over the critical regions of the frame assembly, with a section modulus of 18.96 cubic inches with a rbm of 2,275,200 in-lb over the rear

axle. The frame rails will be constructed of 120,000 psi yield strength heat-treated 0.38" thick steel with 3.50" wide flanges.

4.28 FRAME REINFORCEMENT - In addition, a full-length mainframe internal "C" liner will be provided. The liner will be an internal "C" design that steps to a smaller internal "C" design over the rear axle. It will be heat-treated steel measuring 12.50" x 3.00" x 0.25" through the front "C" portion of the liner, stepping to 9.38" x 3.00" x 0.25" through the rear "C" portion of the liner. Each liner will have a section modulus of 13.58 cubic inches, yield strength of 110,000 psi, and rbm of 857,462 in-lb. Total rbm at wheelbase center will be 4,391,869 in-lb. The frame liner will be mounted inside of the chassis frame rail and extend the full length of the frame.

4.29 FRONT NON-DRIVE AXLE - The Oshkosh TAK-4® front axle will be of the independent suspension design with a ground rating of 22,800 lb. Upper and lower control arms will be used on each side of the axle. Upper control arm castings will be made of 100,000-psi yield strength 8630 steel and the lower control arm casting will be made of 55,000-psi yield ductile iron.

4.29.1 The center cross members and side plates will be constructed out of 80,000-psi yield strength steel.

4.29.2 Each control arm will be mounted to the center section using elastomer bushings. These rubber bushings will rotate on low friction plain bearings and be lubricated for life. Each bushing will also have a flange end to absorb longitudinal impact loads, reducing noise and vibrations.

4.29.3 There will be nine (9) grease fittings supplied, one (1) on each control arm pivot and one (1) on the steering gear extension.

4.29.4 The upper control arm will be shorter than the lower arm so that wheel end geometry provides positive camber when deflected below rated load and negative camber above rated load.

4.29.5 Camber at load will be 0 degrees for optimum tire life.

4.29.6 The ball joint bearing will be of low friction design and be maintenance free.

4.29.7 Toe links that are adjustable for alignment of the wheel to the center of the chassis will be provided.

4.29.8 The wheel ends will have little to no bump steer when the chassis encounters a hole or obstacle.

4.29.9 The steering linkage will provide proper steering angles for the inside and outside wheel, based on the vehicle wheelbase.

4.29.10 The axle will have a third party certified turning angle of 45 degrees. Front discharge, front suction, or aluminum wheels will not infringe on this cramp angle.

4.30 FRONT SUSPENSION

4.30.1 Front Oshkosh TAK-4™ independent suspension will be provided with a minimum ground rating of 22,800 lb.

4.30.2 The independent suspension system will be designed to provide maximum ride comfort. The design will allow the vehicle to travel at highway speeds over improved road surfaces and at moderate speeds over rough terrain with minimal transfer of road shock and vibration to the vehicle's crew compartment.

4.30.3 Each wheel will have torsion bar type spring. In addition, each front wheel end will also have energy absorbing jounce bumpers to prevent bottoming of the suspension.

4.30.4 The suspension design will be such that there is at least 10.00" of total wheel travel and a minimum of 3.75" before suspension bottoms.

4.30.5 The torsion bar anchor lock system allows for simple lean adjustments, without the use of shims. One can adjust for a lean within 15 minutes per side. Anchor adjustment design is such that it allows for ride height adjustment on each side.

4.30.6 The independent suspension was put through a durability test that simulated 140,000 miles of inner city driving.

4.31 FRONT SHOCK ABSORBERS - KONI heavy-duty telescoping shock absorbers will be provided on the front suspension.

4.32 FRONT OIL SEALS - Oil seals with viewing window will be provided on the front axle.

- 4.33 FRONT TIRES** - Front Tires will be Michelin 425/65R22.50 radials, 20 ply XFE wide base tread, rated for 22,800 lb maximum axle load and 75 mph maximum speed. The tires will be mounted on Accuride® 22.50" x 12.25" steel disc type wheels with a ten (10) stud, 11.25" bolt circle.
- 4.34 REAR AXLE** - The rear axle will be a Meritor™, Model RS-26-185, with a capacity of 27,000 lb.
- 4.35 TOP SPEED OF VEHICLE** - A rear axle ratio will be furnished to allow the vehicle to reach a top speed of 68 mph.
- 4.36 REAR SUSPENSION** - The rear suspension will be Standens, semi-elliptical, 3.00" wide x 53.00" long, 12-leaf pack with a ground rating of 27,000 lb. The spring hangers will be castings. The two (2) top leaves will wrap the forward spring hanger pin, and the rear of the spring will be a slipper style end that will ride in a rear slipper hanger. To reduce bending stress due to acceleration and braking, the front eye will be a berlin eye that will place the front spring pin in the horizontal plane within the main leaf. A steel encased rubber bushing will be used in the spring eye. The steel encased rubber bushing will be maintenance free and require no lubrication.
- 4.37 REAR OIL SEALS** - Oil seals will be provided on the rear axle(s).
- 4.38 REAR TIRES** -Rear tires will be four (4) Michelin 12R22.50 radials, 16 ply "all position" XZE* tread, rated for 27,120 lb maximum axle load and 75 mph maximum speed. The tires will be mounted on Accuride® 22.50" x 8.25" steel disc type wheels with a ten (10) stud, 11.25" bolt circle.
- 4.39 TIRE BALANCE** - All tires will be balanced with Counteract balancing beads. The beads will be inserted into the tire and eliminate the need for wheel weights.
- 4.40 TIRE PRESSURE MANAGEMENT** - There will be a RealWheels LED AirSecure™ tire alert pressure management system provided, that will monitor each tire's pressure. A sensor will be provided on the valve stem of each tire for a total of six (6) tires.
- 4.40.1** The sensor will calibrate to the tire pressure when installed on the valve stem for pressures between 10 and 200 psi. The sensor will activate an integral battery-operated LED when the pressure of that tire drops 5 to 8 psi.
- 4.40.2** Removing the cap from the sensor will indicate the functionality of the sensor and battery. If the sensor and battery are in working condition, the LED will immediately start to flash.
- 4.41 FRONT HUB COVERS** - Stainless steel hub covers will be provided on the front axle. An oil level viewing window will be provided.
- 4.42 HUB COVERS (rear)** - Stainless steel baby moon covers will be provided over the rear axle hubs.
- 4.43 CHROME LUG NUT COVERS** - Chrome lug nut covers will be supplied on front and rear wheels.
- 4.44 MUD FLAPS** - Mud flaps will be installed behind the front and rear wheels.
- 4.45 WHEEL CHOCKS** - There will be one (1) pair of Ziamatic AC-32, aluminum alloy wheel blocks provided.
- 4.46 ELECTRONIC STABILITY CONTROL** - A vehicle control system will be provided as an integral part of the ABS brake system from Meritor Wabco.
- 4.46.1** The system will monitor and update the lateral acceleration of the vehicle and compare it to a critical threshold where a side roll event may occur. If the critical threshold is met, the vehicle control system will automatically reduce engine RPM, engage the engine retarder (if equipped), and selectively apply brakes to the individual wheel ends of the front and rear axles to reduce the possibility of a side roll event.
- 4.46.2** The system will monitor directional stability through a lateral accelerometer, steer angle sensor and yaw rate sensor. If spinout or drift out is detected, the vehicle control system will selectively apply brakes to the individual wheel ends of the front and rear axles to bring the vehicle back to its intended direction.
- 4.47 ANTI-LOCK BRAKE SYSTEM** - The vehicle will be equipped with a Wabco 4S4M, anti-lock braking system. The ABS will provide a four (4) channel anti-lock braking control on both the front and rear wheels. A digitally controlled

system that utilizes microprocessor technology will control the anti-lock braking system. Each wheel will be monitored by the system. When any wheel begins to lockup, a signal will be sent to the control unit. This control unit will then reduce the braking of that wheel for a fraction of a second and then reapply the brake. This anti-lock brake system will eliminate the lockup of any wheel thus helping to prevent the apparatus from skidding out of control.

- 4.48 AUTOMATIC TRACTION CONTROL** - An anti-slip feature will be included with the ABS. The Automatic Traction Control will be used for traction in poor road and weather conditions. The Automatic Traction Control will act as an electronic differential lock that will not allow a driving wheel to spin, thereby supplying traction at all times. The ABS electronic control unit (ECU) will work with the engine ECU, sharing information concerning wheel slip. Engine ECU will use information to control engine speed, allowing only as much throttle application as required for the available traction, regardless of how much the driver is asking for. An "off road traction" switch will be provided on the instrument panel. Activation of the switch will allow additional tire slip to let the truck climb out and get on top of deep snow or mud.
- 4.49 BRAKES** - The service brake system will be full air type. The front brakes will be Knorr/Bendix disc type with a 17.00" ventilated rotor for improved stopping distance. The brake system will be certified, third party inspected, for improved stopping distance. The rear brakes will be Meritor™, Disc Plus, Model EX225, disc operated with automatic slack adjusters and a 17.00" ventilated rotor for improved stopping distance.
- 4.50 AIR COMPRESSOR, BRAKE SYSTEM** - The air compressor will be a Bendix®, Model BA-921, with 15.80 cubic feet per minute output at 1,250 rpm.
- 4.51 BRAKE SYSTEM** - The brake system will include:
- 4.51.1** Bendix® dual brake treadle valve
 - 4.51.2** Heated automatic moisture ejector on air dryer.
 - 4.51.3** Total air system capacity of 4,362 cubic inches
 - 4.51.4** Two (2) air pressure gauges with a red warning light and an audible alarm, that activates when air pressure falls below 60 psi.
 - 4.51.5** Spring set parking brake system
 - 4.51.6** Parking brake operated by a push-pull style control valve.
 - 4.51.7** A parking "brake on" indicator light on instrument panel
 - 4.51.8** Park brake relay/inversion and anti-compounding valve, in conjunction with a double check valve system, with an automatic spring brake application at 40 psi
 - 4.51.9** A pressure protection valve to prevent all air operated accessories from drawing air from the air system when the system pressure drops below 80 psi (550 kPa)
 - 4.51.10** 1/4 turn drain valve on each air tank.
 - 4.51.11** There will be one (1) U-bolt type protective guard(s) installed over the "Parking Brake" knob to prevent accidental activation of the brake. The guard will be located on the driver's side.
 - 4.51.12** The air tank will be primed and painted to meet a minimum 750-hour salt spray test.
 - 4.51.13** To reduce the effects of corrosion, the air tank will be mounted with stainless steel brackets.
- 4.52 BRAKE SYSTEM AIR DRYER** - The air dryer will be WABCO System Saver 1200 with spin-on coalescing filter cartridge and 100-watt heater.
- 4.53 BRAKE LINES** - Color-coded nylon brake lines will be provided. The lines will be wrapped in a heat protective loom in the chassis areas that are subject to excessive heat.
- 4.54 AIR INLET/OUTLET** - One (1) air inlet/outlet will be installed with the female coupling located on the driver side pump panel. This system will tie into the "wet" tank of the brake system and include a check valve in the inlet line and an 85-psi pressure protection valve in the outlet line. The air outlet will be controlled by a needle valve.
- 4.54.1** A mating male fitting will be provided with the loose equipment.
 - 4.54.2** The air inlet will allow a shoreline air hose to be connected to the vehicle. This will allow station air to be supplied to the brake system of the vehicle to insure constant air pressure.

4.55 AIR TANK, SPECIAL LOCATION – Air tank shall NOT be located under the def pump/filter, it should be mounted outboard of the frame rail.

4.56 AIR COMPRESSOR, BRAKE SYSTEM MAINTENANCE

4.56.1 A Kussmaul, Model 091-9B-1 air compressor will be provided. It will be driven by the 120-volt shoreline electrical system and will be located driver side rear facing seat riser and removable from the front access panel. Knockouts on the panel shall be included, not louvers.

4.56.2 The compressor will maintain the air pressure in the chassis air brake system while the vehicle is not in use.

4.56.3 A pressure switch will sense when the system pressure drops and automatically start the compressor, which then will run until pressure is restored.

4.57 REMOTE AIR TANK DRAIN - There will be a remote mounted 1/4 turn drain valve installed on each air supply reservoir. The drain valve will be actuated from the underside of the driver side body corner. .375" airline will be provided between each drain valve and the reservoirs.

4.58 AIR TANK DRAINS - Air tank drains will be mounted at the lowest point on the bottom of the tank for maximum drainage.

4.59 COMPRESSION FITTINGS ONLY - Any nylon tube on the brake system that is pneumatic will be plumbed with compression type fittings where applicable. Push lock fittings will not be acceptable for any pneumatic nylon tube plumbing.

4.60 ENGINE - The chassis will be powered by an electronically controlled engine as described below:

Make:	Paccar
Model:	MX
Power:	510 hp at 1600 rpm
Torque:	1850 lb-ft at 100 rpm
Governed Speed:	Full Load - 1900 rpm Road/2080 rpm Parked PTO
Emissions Certification:	EPA 2027
Fuel:	Diesel
Cylinders:	Six (6)
Displacement:	13.7L
Starter:	DP60
Fuel Filters:	Dual cartridge style with check valve, water separator, and water in fuel sensor

4.61 The engine will include On-board diagnostics (OBD), which provides self-diagnostic and reporting. The system will give the City or repair technician access to state of health information for various vehicle sub systems. The system will monitor vehicle systems, engine and after treatment. The system will illuminate a malfunction indicator light on the dash console if a problem is detected.

4.62 HIGH IDLE - A high idle switch will be provided, inside the cab, on the instrument panel, that will automatically maintain a preset engine rpm. A switch will be installed, at the cab instrument panel, for activation/deactivation.

4.62.1 The high idle will be operational only when the parking brake is on, and the truck transmission is in neutral. A green indicator light will be provided, adjacent to the switch. The light will illuminate when the above conditions are met. The light will be labeled "OK to Engage High Idle".

- 4.62.2** The high idle circuit will be programmed to allow high idle with the parking brake applied, transmission in neutral and pump not in gear.
- 4.63 ENGINE BRAKE** - The compression release brake option is a fully integrated MX engine braking system. It utilizes the turbocharger and backpressure valve but adds in a hydraulically operated compression brake to increase overall retarding power.
- 4.63.1** The driver will be able to turn the engine brake system on/off and have a high, medium and low setting.
- 4.63.2** The engine brake will be installed in such a manner that when the engine brake is slowing the vehicle the brake lights are activated.
- 4.63.3** The ABS system will automatically disengage the auxiliary braking device when required.
- 4.64 CLUTCH FAN** - A fan clutch will be provided. The fan clutch will be automatic when the pump transmission is in "Road" position, and fully engaged in "Pump" position.
- 4.65 HEAVY DUTY OIL LINE** - A heavy duty oil line and fittings will be provided between the engine oil pan and the oil level manifold.
- 4.66 ENGINE AIR INTAKE** - An air intake with an ember separator (to prevent road dirt, burning embers, and recirculating hot air from entering the engine) will be mounted at the front of the apparatus, on the passenger side of the engine. The ember separator will be mounted in the air intake with flame retardant, roto-molded polyethylene housing. It will be easily accessible by the hinged access panel at the front of the vehicle.
- 4.67 EXHAUST SYSTEM** - The exhaust system will include a diesel particulate filter (DPF) and a selective catalytic reduction (SCR) device to meet current EPA standards. The exhaust system will be stainless steel from the turbo to the inlet of the SCR device and will be 5.00" in diameter.
- 4.67.1** An insulation wrap will be provided on all exhaust pipe between the turbo and SCR to minimize the transfer of heat to the cab.
- 4.67.2** The exhaust will terminate horizontally ahead of the right-side rear wheels, flush with the body rubrail. Tailpipe will be angled 35 degrees to the rear. A tailpipe diffuser will be provided to reduce the temperature of the exhaust as it exits. Heat deflector shields will be provided to isolate chassis and body components from the heat of the tailpipe diffuser.
- 4.68 EXHAUST MODIFICATION** - The exhaust pipe will be brought out from under the body at a 90-degree angle from the truck. The tail pipe will terminate at the body side and will be flush with the body side.
- 4.69 EXHAUST MODIFICATION** - The tail pipe will terminate as close to the rear axle as possible without creating interference.
- 4.70 RADIATOR** - The radiator and the complete cooling system will meet or exceed NFPA and engine manufacturer cooling system standards.
- 4.70.1** For maximum corrosion resistance and cooling performance, the entire radiator core will be constructed using long life aluminum alloy. The core will be made of aluminum fins, having a serpentine design, brazed to aluminum tubes. The tubes will be brazed to aluminum headers. The radiator core will have a minimum frontal area of 1434 square inches. Supply tank made of glass-reinforced nylon and a return tank of cast aluminum alloy will be crimped on to the core assembly using header tabs and a compression gasket to complete the radiator core assembly. The radiator will be compatible with commercial antifreeze solutions.
- 4.70.2** There will be a full steel frame around the entire radiator core assembly. The radiator core assembly will be isolated within the steel frame by rubber inserts to enhance cooling system durability and reliability. The radiator will be mounted in such a manner as to prevent the development of leaks caused by twisting or straining when the apparatus operates over uneven ground. The radiator assembly will be isolated from the chassis frame rails with rubber isolators.
- 4.70.3** The radiator assembly will include an integral deaeration tank permanently mounted to the top of the radiator framework, with a readily accessible remote-mounted overflow tank. For visual coolant level inspection, the radiator will have a built-in sight glass. The radiator will be equipped with a 15-psi pressure relief cap.

- 4.70.4** A drain port will be located at the lowest point of the cooling system and/or the bottom of the radiator to permit complete flushing of the coolant from the system.
- 4.70.5** A heavy-duty fan will draw in fresh, cool air through the radiator. Shields or baffles will be provided to prevent recirculation of hot air to the inlet side of the radiator.
- 4.71 COOLANT LINES** - Gates, or Goodyear, rubber hose will be used for all engine coolant lines installed by the chassis manufacturer.
- 4.71.1** Hose clamps will be stainless steel "constant torque type" to prevent coolant leakage. They will react to temperature changes in the cooling system and expand or contract accordingly while maintaining a constant clamping pressure on the hose.
- 4.72 INSULATION WRAP** - The electrical wiring harness will be wrapped with orange heat resistant insulation to prevent damage from the heat of the lower radiator hoses.
- 4.73 FUEL TANK** - A 75-gallon fuel tank will be provided and mounted at the rear of the chassis. The tank will be constructed of 12-gauge, hot rolled steel. It will be equipped with swash partitions and a vent. To eliminate the effects of corrosion, the fuel tank will be mounted with stainless steel straps.
- 4.73.1** A .75" drain plug will be provided in a low point of the tank for drainage.
- 4.73.2** A fill inlet will be located on the left hand and right-hand side of the body and be covered with a hinged, spring-loaded, stainless-steel door that is marked "Ultra Low Sulfur - Diesel Fuel Only."
- 4.73.3** A .50" diameter vent will be provided running from top of tank to just below fuel fill inlet.
- 4.73.4** The tank will meet all FHWA 393.67 requirements, including a fill capacity of 95 percent of tank volume.
- 4.73.5** AeroQuip® wire braid, reinforced fuel lines will be provided for the chassis fuel system. The fittings will be reusable screw type.
- 4.74 DIESEL EXHAUST FLUID TANK** – A 4.5-gallon diesel exhaust fluid (DEF) tank will be provided and mounted in the driver's side body rearward of the rear axle.
- 4.74.1** A 0.50" drain plug will be provided in a low point of the tank for drainage.
- 4.74.2** A fill inlet will be provided and marked "Diesel Exhaust Fluid Only". The fill inlet will be located adjacent to the engine fuel inlet behind a common hinged, spring loaded, painted door on the driver side of the vehicle.
- 4.74.3** The tank will meet the engine manufacturers requirement for 10 percent expansion space in the event of tank freezing.
- 4.74.4** The tank will include an integrated heater unit that utilizes engine coolant to thaw the DEF in the event of freezing.
- 4.74.5** The stainless-steel flip door for selecting between DEF fill and the diesel fill will be spring loaded to default covering the DEF fill.
- 4.75 FUEL COOLER** - An air to fuel cooler will be installed in the engine fuel return line. The fuel filler cap will have a retaining chain and holder provided on the fuel fill door.
- 4.76 TRANSMISSION** – An Allison 5th generation, Model EVS 4000P, electronic, torque converting, automatic transmission will be provided.
- 4.76.1** The transmission will be equipped with prognostics to monitor oil life, filter life, and transmission health. A wrench icon on the shift selector's digital display will indicate when service is due.
- 4.76.2** Two (2) PTO openings will be located on left side and top of converter housing (positions 8 o'clock and 1 o'clock).
- 4.76.3** A transmission temperature gauge with red light and buzzer will be installed on the cab instrument panel.
- 4.77 TRANSMISSION SHIFTER** - A six (6)-speed push button shift module will be mounted to right of driver on console. Shift position indicator will be indirectly lit for after dark operation. The transmission ratio will be:

1st	3.51 to 1.00
2nd	1.91 to 1.00

3rd	1.43 to 1.00
4th	1.00 to 1.00
5th	0.75 to 1.00
6th	0.64 to 1.00
R	4.80 to 1.00

- 4.78 TRANSMISSION COOLER:** A Modine plate and fin transmission oil cooler will be provided using engine coolant to control the transmission oil temperature.
- 4.79 DOWNSHIFT MODE (w/engine brake) :** The transmission will be provided with an aggressive downshift mode. This will provide earlier transmission downshifts to 2nd gear from 6th gear, resulting in improved engine braking performance.
- 4.80 DRIVELINE:** Drivelines will be a heavy-duty metal tube and be equipped with Spicer® 1810 universal joints.
- 4.80.1** The shafts will be dynamically balanced before installation.
- 4.80.2** A splined slip joint will be provided in each driveshaft where the driveline design requires it. The slip joint will be coated with Glidecoat® or equivalent.
- 4.81 PAINT PUMP TRANSMISSION AND DRIVE TRANSMISSION OUTPUT YOKES:** The pump transmission and drive transmission output yokes will be brush painted, not spray painted. The drive transmission output yoke will be the same color as the driveshaft which is black. The pump transmission yokes will be brush painted job color.
- 4.82 UNIVERSAL JOINT GREASE SHIELDS:** Each universal joint and slip joint in the driveline will have a shield to prevent grease from being thrown against the underside of the body, chassis and components.
- 4.83 STEERING:** Dual Sheppard, Model M110, steering gears, with integral heavy-duty power steering, will be provided. For reduced system temperatures, the power steering will incorporate an air to oil cooler and an Eaton, Model VN20, hydraulic pump with integral pressure and flow control. All power steering lines will have wire braded lines with crimped fittings. A tilt and telescopic steering column will be provided to improve fit for a broader range of driver configurations.
- 4.84 STEERING WHEEL:** The steering wheel will be 18.00" in diameter, have tilting and telescoping capabilities, and a 4-spoke design.
- 4.85 SHROUD:** An aluminum shroud will be mounted over the Wabco main module located in the frame rails to deflect water and debris from above.
- 4.86 TAG/LABEL:** The following one (1) tags or labels will be provided DS nose cone above fill location on the chassis or cab. The tag/label will be configured and read "POWER STEERING FLUID:15W40 DO NOT OVER FILL" see photo of 30782 and 31672 in job efolder.
- 4.87 STEERING GEAR OIL:** Standard steering gear oil to be replace with 15W40 CJ-4 motor oil. All labeling will be changed to reflect the 15W40 CJ-4 motor oil.
- 4.88 BUMPER -** A one (1)-piece, 0.25" thick steel channel bumper, a minimum 10.00" high will be attached to the front of the chassis frame. The bumper will be painted job color. A 9.00" formed steel channel will be mounted directly behind bumper for additional strength. The bumper will be extended 10.00" from front face of cab.
- 4.89 Gravel Pan:** A gravel pan, constructed of bright aluminum treadplate, will be furnished between the bumper and cab face. The gravel pan will be properly supported from the underside to prevent flexing and vibration of the aluminum treadplate.
- 4.90 LIFT AND TOW MOUNTS WITH TOW EYES:** Mounted to the frame extension will be lift and tow mounts. Incorporated in the mounts will be two (2) painted steel tow eyes. The lift and tow mounts will be designed and positioned to adapt to certain tow truck lift systems. The tow eyes will not be used for lifting of the apparatus.
- 4.90.1** The inner and outer edges of the tow eyes will have a 0.25" radius.
- 4.90.2** The lift and tow mounts with eyes will be painted orange #22.

- 4.91 TOW EYES:** Two (2) cutouts will be provided in the front face of the bumper to allow two (2) Chicago style tow eyes to extend out the front. The inner and outer edges of the utility eyes will have a 0.25 radius.
- 4.91.1** The tow eyes will be designed and positioned to allow up to a 6,000 pound straight horizontal pull in line with the centerline of the vehicle. The tow eyes will not be used for lifting of the apparatus.
- 4.91.2** The utility eyes will be painted to match chassis frame.
- 4.92 TOW HOOKS:** No tow hooks shall be provided. This truck will be equipped with a lift and tow package with integral tow eyes.
- 4.93 LICENSE PLATE (Mounting Holes):** Four (4) mounting holes will be provided in the center of the front bumper for City to mount a license plate.
- 4.94 CAB:** the velocity cab will be designed specifically for the fire service and will be manufactured by pierce manufacturing.
- 4.94.1** To provide quality at the source and single source customer support, the cab will be built by the apparatus manufacturer in a facility located on the manufacturer's premises.
- 4.94.2** For reasons of structural integrity and enhanced occupant protection, the cab will be of heavy-duty design, constructed to the following minimal standards.
- 4.94.3** The cab will have 12 main vertical structural members located in the A-pillar (front cab corner posts), B-pillar (side center posts), C-pillar (rear corner posts) and rear wall areas. The A-pillar will be constructed of 0.25" heavy wall extrusions joined by a solid A356-T6 aluminum joint casting. The B-pillar and C-pillar will also be constructed from 0.25" heavy wall extrusions. The rear wall will be constructed of two (2) 4.00" x 2.00" outer aluminum extrusions and two (2) 3.00" x 2.00" inner aluminum extrusions. All main vertical structural members will run from the floor to 7.50" x 3.50" x 0.125" thick roof extrusions to provide a cage-like structure with the A-pillar and roof extrusions being welded into a 0.75" thick corner casting at each of the front corners of the roof assembly.
- 4.94.4** The front of the cab will be constructed of a 0.25" thick firewall, covered with a 0.125" front skin (for a total thickness of 0.38"), and reinforced with 24.50" wide x 10.00" deep x 0.50" thick supports on each side of the engine tunnel. The cross-cab support will be welded to the A-pillar, 0.25" firewall, and engine tunnel, on the left and right sides.
- 4.94.5** The cab floors will be constructed of 0.1875" thick aluminum plate and reinforced at the firewall with an additional 0.25" thick cross-floor support providing a total thickness of 0.44" of structural material at the front floor area. The front floor area will also be supported with three (3) 0.50" plates bolted together that also provides the mounting point for the cab lift. This tubing will run from the front of the cab to the 0.1875" thick engine tunnel, creating the structure to support the forces created when lifting the cab.
- 4.94.6** The cab will be a full-tilt style. A 3-point cab mount system with rubber isolators will improve ride quality by isolating chassis vibrations from the cab.
- 4.94.7** The crew cab will be a totally enclosed design with the interior area completely open to improve visibility and verbal communication between the occupants.
- 4.94.8** The forward cab section will have an overall height (from the cab roof to the ground) of approximately 102.00". The crew cab section will have a 10.00" raised roof, with an overall cab height of approximately 112.00". The raised portion will start at the most forward point of the B-pillar and continue rearward to the back of the cab. The overall height listed will be calculated based on a truck configuration with the lowest suspension weight ratings, the smallest diameter tires for the suspension, no water weight, no loose equipment weight, and no personnel weight. Larger tires, wheels, and suspension will increase the overall height listed.
- 4.94.9** The cab will have an interior width of not less than 93.50". The driver and passenger seating positions will have a minimum 24.00" clear width at knee level.

- 4.94.10** To reduce injuries to occupants in the seated positions, proper head clearance will be provided. The floor-to-ceiling height inside the forward cab of will be no less than 60.25". The floor-to-ceiling height inside the crew cab will be no less than 62.95" in the center position and 68.75" in the outboard positions.
- 4.94.11** The crew cab will measure a minimum of 71.50" from the rear wall to the backside of the engine tunnel (knee level) for optimal occupant legroom.
- 4.95 INTERIOR CAB INSULATION:** The cab walls, ceiling and engine tunnel will be insulated in all strategic locations to maximize acoustic absorption and thermal insulation. The cab will be insulated with 2.00" insulation in the rear wall, 3.00" insulation in the side walls, and 1.50" insulation in the ceiling.
- 4.96 FENDER LINERS:** Full-circular, aluminum inner fender liners in the wheel wells will be provided.
- 4.97 PANORAMIC WINDSHIELD:** A one (1)-piece, safety glass windshield with more than 2,802 square inches of clear viewing area will be provided. The windshield will be full width and will provide the occupants with a panoramic view. The windshield will consist of three (3) layers: the outer light, the middle safety laminate, and the inner light. The 0.114" thick outer light layer will provide superior chip resistance. The middle safety laminate layer will prevent the windshield glass pieces from detaching in the event of breakage. The inner light will provide yet another chip resistant layer. The cab windshield will be bonded to the aluminum windshield frame using a urethane adhesive. A custom frit pattern will be applied on the outside perimeter of the windshield for a finished automotive appearance.
- 4.98 WINDSHIELD WIPERS:**
- 4.98.1** Three (3) electric windshield wipers with a washer, in conformance with FMVSS and SAE requirements, will be provided. The wiper blades will be 21.65" long and together will clear a minimum of 1,783 square inches of the windshield for maximum visibility in inclement weather.
- 4.98.2** The windshield washer fluid reservoir will be located at the front of the vehicle and be accessible through the access hood for simple maintenance.
- 4.99 FAST SERVICE ACCESS FRONT TILT HOOD** -A full-width access hood will be provided for convenient access to engine coolant, steering fluid, wiper fluid, cab lift controls, headlight power modules, and ember separator. The hood will also provide complete access to the windshield wiper motor and components. The hood will be contoured to provide a sleek, automotive appearance. The hood will be constructed of two (2) fiberglass panels bonded together and will include reinforcing ribs for structural integrity. The hood will include air cylinders to hold the hood in open and closed positions, and a heavy-duty latch system that will meet FMVSS 113 (Hood Latch System). The spring-loaded hood latch will be located at the center of the hood with a double-action release lever located behind the Pierce logo. The two (2)-step release requires the lever first be pulled to the driver side until the hood releases from the first latch (primary latch) then to the passenger side to fully release the hood (secondary latch).
- 4.100 ENGINE TUNNEL** -To provide structural strength, the engine tunnel sidewalls will be constructed of 0.50" aluminum plate that is welded to both the 0.25" firewall and 0.38" heavy wall extrusion under the crew cab floor. To maximize occupant space, the top edges will be tapered.
- 4.100.1** The back of the engine tunnel will be no higher than 16.25" off the crew cab floor.
- 4.100.2** The engine tunnel will be insulated on both sides for thermal and acoustic absorption. The underside of the tunnel will be sprayed with insulation. The insulation will keep noise (dBA) levels at or lower than the specifications in the current edition of the NFPA 1901 standards.
- 4.101 CAB REAR WALL EXTERIOR COVERING-** The exterior surface of the rear wall of the cab will be overlaid with bright aluminum treadplate except for areas that are not typically visible when the cab is lowered.
- 4.102 CAB LIFT** -A hydraulic cab lift system will be provided, consisting of an electric-powered hydraulic pump, fluid reservoir, dual lift cylinders, remote cab lift controls and all necessary hoses and valves. The hydraulic pump will have a backup manual override, for use in the event of an electrical failure.
- 4.102.1** The cab lift controls will be located at the driver side front of the cab, easily accessible under the full width front access hood. The controls will include a permanently mounted raise/lower switch. For enhanced visibility during cab tilt operations, a remote-control tether with on/off switch will be supplied on a coiled cord that will extend from 2.00' (coiled) to 6.00' (extended).

- 4.102.2** The cab will be capable of tilting 42 degrees and 80 degrees with crane assist to accommodate engine maintenance and removal. The cab pivots will be located 46.00" apart to provide stability while tilting the cab.
- 4.102.3** The rear of the cab will be locked down by a two (2)-point, automatic, hydraulic, double hook mechanism that fully engages after the cab has been lowered (self-locking). The dual 2.25" diameter hydraulic cylinders will be equipped with a velocity fuse that protects the cab from accidentally descending when the cab is in the tilt position.
- 4.102.4** For increased safety, a redundant mechanical stay arm will be provided that must be manually put in place on the driver side between the chassis and cab frame when cab is in the raised position. This device will be manually stowed to its original position before the cab can be lowered.
- 4.103 CAB LIFT INTERLOCK** -The cab lift safety system will be interlocked to the parking brake. The cab tilt mechanism will be active only when the parking brake is set, and the ignition switch is in the on position. If the parking brake is released, the cab tilt mechanism will be disabled.
- 4.104 CAB LIFT STAY ARM** - DuraSurf™ on the cab lift stay arm will be held in place with #10 flush mount screws.
- 4.105 GRILLE** -A bright finished aluminum mesh grille screen, inserted behind a formed bright finished grille surround, will be provided on the front center of the cab, and will serve as an air intake to the radiator.
- 4.106 SCUFFPLATE** - A treadplate scuffplate will be installed on the top edge of both rear facing seat risers. The scuffplate will be flanged to the front to protect the painted edge of the seat riser.
- 4.107 FRONT CAB TRIM** - Bright finished wrap-around housings will be provided on each side of the front cab face for mounting of the headlights and front directional lights. The housings will mate up to the side edge of the forward grille, and then extend around the front corners of the cab rearward, providing for a streamlined automotive appearance.
- 4.108 MIRRORS** -Ramco, Model 6001FFHR-750HR, polished aluminum 9.25" wide x 13.50" high mirrors, with full flat glass section, will be mounted on each side of the front cab corner. A convex section will be bolted to the top of each mirror.
- 4.108.1** The flat glass in each mirror will be heated and adjustable with remote controls that are convenient to the driver.
- 4.108.2** The convex section in each mirror will be heated and adjustable with remote controls.
- 4.108.3** There will be a 6.00" riser, for the right-side mirror, mounted between the mirror body and mirror arm.
- 4.109 MIRROR (SIDE VIEW)** - Exterior officer's side view mirror will be provided on the cab. Mirror will allow passenger to view the side cab blind spot and the area to the rear of the truck. Mirror will be located on the cab door, mounted on an adjustable arm. Mirror head will be an 8.00" convex mirror.
- 4.110 FRONT CROSS VIEW MIRROR** - There will be one (1) 8.00" diameter eyeball mirror provided on the passenger side front corner of the cab. It will be mounted high, above the windshield. The mirror will provide the driver with a view of the front bumper and the front of the truck.
- 4.110.1** The mirror housing, tubing, clamps and hardware will be constructed of corrosion resistant stainless steel.
- 4.110.2** Mirror head will be K-10, EB50S-S, 8.00" stainless steel housing with three (3) arms.
- 4.110.3** A 6.00" riser will be provided between the mirror body and support arm on the right side only.
- 4.111 CAB DOORS** - The forward cab and crew cab doors will be the half-height style door. To enhance entry and egress to the cab, the forward cab doors will be a minimum of 43.59" wide x 64.71" high. The crew cab doors will measure a minimum of 37.87" wide x 73.75" high.
- 4.111.1** The forward cab and crew cab doors will be constructed of extruded aluminum with a nominal material thickness of 0.125". The exterior door skins will be constructed from 0.090" aluminum.
- 4.111.2** The forward cab door windows will include a 7.50" high x 10.00" wide drop area at the front to enhance visibility.

- 4.111.3** A customized, vertical, pull-down type door handle will be provided on the exterior of each cab door. The exterior handle will be designed specifically for the fire service to prevent accidental activation and will provide 4.00" wide x 2.00" deep hand clearance for ease of use with heavy gloved hands. Each door will also be provided with an interior flush, open style paddle handle that will be readily operable from fore and aft positions, be designed to prevent accidental activation. The interior handles will provide 4.00" wide x 1.25" deep hand clearance for ease of use with heavy gloved hands.
- 4.111.4** The cab doors will be provided with both interior (rotary knob) and exterior (keyed) locks exceeding FMVSS standards. The keys will be Model 1041. The locks will be capable of activating when the doors are open or closed. The doors will remain locked if locks are activated when the doors are opened, then closed.
- 4.111.5** A full length, heavy duty, stainless steel, piano-type hinge with a 0.38" pin and 11-gauge leaf will be provided on all cab doors. There will be double automotive-type rubber seals around the perimeter of the door framing and door edges to ensure a weather-tight fit.
- 4.111.6** A chrome grab handle will be provided on the inside of each cab and crew cab door.
- 4.111.7** A red webbed grab handle will be installed on the crew cab door stop strap. The grab handles will be securely mounted.
- 4.111.8** The cab steps at each cab door location will be located below the cab doors and will be exposed to the exterior of the cab.
- 4.112 Door Panels** - The inner cab door panels will be constructed out of brushed stainless steel. The cab door panels will be removable.
- 4.113 RECESSED POCKET WITH ELASTIC COVER** - To provide organized storage (clutter control) in the cab for miscellaneous equipment, the cab interior will be provided with recessed storage pockets. The pockets will be 5.63" wide x 2.00" high and 6.24". The pockets will be provided with a perforated elastic material cover to secure the equipment in the pocket. The pockets will be installed Loc 7 & Loc 8, as indicated on the instrument panel layout.
- 4.114 ELECTRIC WINDOW CONTROLS** -Each cab entry door will be equipped with an electrically operated tempered glass window. A window control panel will be located on the door panel within easy reach of the respective occupant. Each switch will allow intermittent or auto down operation for ease of use. Auto down operation will be actuated by holding the window down switch for approximately 1 second. The driver control panel will contain a control switch for each cab door's window. All other door control panels will contain a single switch to operate the window within that door. The window switches will be connected directly to the battery power. This allows the windows to be raised and lowered when the battery switch is in the off position.
- 4.115 ELECTRIC CAB DOOR LOCKS:** The front driver, officer and crew cab doors will have a door lock master switch. The switches will control all cab door locks. Each door will have a keyed exterior lock mechanism built into the door handle assembly.
- 4.115.1** There will be one (1) concealed switch on the exterior of the cab, located under the front full width service access panel, that operates the cab door locks.
- 4.115.2** The lock system will include two (2) key FOBs that allow for keyless entry into the vehicle. The key FOB system will use code hopping technology for high security and be FCC part 15 compliant.
- 4.116 DUAL STEPS** - a dual step will be provided below each cab and crew cab door. The steps will be designed with a grip pattern punched into bright aluminum treadplate material providing support, slip resistance, and drainage. The steps will be a bolt-on design and provide a 24.00" wide x 9.00" deep stepping surface. The step design raises the middle step higher and closer to the cab floor, resulting in a 12.00" distance from the step to cab floor in the cab and a 13.50" distance from the step to cab floor in the crew cab. Stepping distances from the ground to first step will be 16.50" and from first step to middle step will be 12.00". The first step will be lit by a white 12-volt dc led light provided on the step.
- 4.117 CAB EXTERIOR HANDRAILS** - A 1.25" diameter slip-resistant, knurled aluminum handrail will be provided adjacent to each cab and crew cab door opening to assist during cab ingress and egress.
- 4.118 STEP LIGHTS** - For reduced overall maintenance costs compared to incandescent lighting, there will be four (4) white LED step lights provided. The lights will be installed at each cab and crew cab door, one (1) per step. The lights will be located in the driver side front doorstep, driver side crew cab doorstep, passenger side front doorstep and passenger side crew cab doorstep.

- 4.118.1** In order to ensure exceptional illumination, each light will provide a minimum of 25 foot-candles (fc) covering an entire 15.00" x 15.00" square placed 10.00" below the light and a minimum of 1.5 fc covering an entire 30.00" x 30.00" square at the same 10.00" distance below the light.
- 4.118.2** The lights will be activated when the adjacent door is opened.
- 4.119 FENDER CROWNS** - Rubber fender crowns will be provided around the cab wheel openings. Crowns will be black.
- 4.120 ADDITIONAL HANDRAIL** - There will be two (2) handrail(s) provided rear corner of the cab, same length and height as the crew cab handrails. Each handrail will be an anodized aluminum extrusion with a ribbed design to provide a positive gripping surface.
- 4.121 CREW CAB WINDOWS** - One (1) fixed window with tinted glass will be provided on each side of the cab, to the rear of the front cab door. The windows will be sized to enhance light penetration into the cab interior. The windows will measure 20.00" wide x 20.50" high. One (1) fixed window with tinted glass will be provided on each side of the cab, to the rear of the crew cab door.
- 4.122 WINDOWS INTERIOR TRIM** - For improved aesthetics, the cab side windows will include a vacuum formed ABS interior trim panel.
- 4.123 WINDOWS, REAR** -The rear wall of the crew cab will have two (2) windows, each being 11.25" wide x 18.00" high.
- 4.124 WINDOW INTERIOR TRIM** -For improved aesthetics, the cab rear wall windows will include a vacuum formed ABS interior trim panel.
- 4.125 STORAGE COMPARTMENT** -Provided under the forward-facing crew cab seats will be a transverse compartment. The compartment will be open top to bottom, with no dividers. The upper section will be 21.50" wide x 13.12" high x 26.25" deep (driver side) and 24.00" deep (passenger side). The top 7.38" of the upper compartment will be full width (transverse) of the crew cab. The lower section on both sides will be 21.50" wide x 15.50" high x 20.00" deep. The compartment will extend from the bottom of the cab to top of the seat riser.
- 4.125.1** The compartment will be sealed off from the inside of the cab.
- 4.125.2** There will be an exterior access door on both sides of the cab with double pan doors painted to match the cab exterior. The doors will be latched with recessed, polished stainless-steel D-ring handles and Eberhard 106 locks. The doors will include gas shock style positive door holders.
- 4.125.3** There will be no interior doors provided.
- 4.125.4** The compartment interior will be painted spatter gray.
- 4.126 Compartment Light** - There will be four (4) white LED strip lights, one (1) each side of exterior compartment door opening. The lighting will be controlled by an automatic door switch.
- 4.127 CAB INSULATION** - The underside of the cab and crew cab floor will be sprayed with insulation. The insulation will keep noise (dBA) levels at or lower than the specifications in the current edition of the NFPA 1901 standards.
- 4.128 CAB DOORS** - All cab doors shall open 90 degrees.
- 4.129 CAB ROOF DRIP RAIL** - For enhanced protection from inclement weather, a drip rail will be furnished on the sides of the cab. The drip rail will be constructed of bright polished extruded aluminum and be bonded to the sides of the cab. The drip rail will extend the full length of the cab roof. The drip rails will also be located under the light brackets welded on the cab roof.
- 4.130 MOUNTING PLATE ON ENGINE TUNNEL** - Equipment installation provisions will be installed on the engine tunnel.
- 4.130.1** A .188" smooth aluminum plate will be bolted to the top surface of the engine tunnel. The plate will extend from behind the instrument panel console, down the taper in the tunnel and terminate at the rear of the storage compartment mounted to the rear of the engine tunnel. The rear horizontal surface of the tunnel will not be covered. The front of the plate will be flanged 45 degrees downward to prevent items from rolling underneath it. The front horizontal surface will be 10.00" from the front flange to the taper down the engine

tunnel. This front surface will not follow the profile of the engine tunnel. An additional reinforcement support will be provided on the right side of the plate at the center bend. The plate will be spaced off the engine tunnel .75" to allow for wire routing below the plate. The mounting surface will be painted to match the cab interior.

- 4.131 MOUNTING PLATE(S)** - There will be one (1) full width and length of the compartment 0.188" aluminum mounting plate(s) provided and installed on top of the DS EMS compartment. The mounting surface will be painted to match the cab interior. The plates(s) will be mounted on .50" spacer stand-offs.
- 4.132 CAB INTERIOR:** With safety as the primary objective, the wrap-around style cab instrument panel will be designed with unobstructed visibility to instrumentation. The dash layout will provide the driver with a quick reference to gauges that allows more time to focus on the road.
- 4.132.1** The center console will be a high impact ABS polymer and will be easily removable.
- 4.132.2** The passenger side dashboard will be constructed of painted aluminum for durability and low maintenance. For enhanced versatility, the passenger side dash will include a flat working surface.
- 4.132.3** To provide optional (service friendly) control panels, switches and storage modules, a painted aluminum overhead console will also be provided.
- 4.132.4** To complete the cab front interior design, painted aluminum modesty panels will be provided under the dash on both sides of the cab. The driver side modesty panel will provide mounting for the battery switch and diagnostic connectors, while the passenger side modesty panel provides a glove box, and ground access to the main electrical distribution panel via quick quarter turn fasteners.
- 4.132.5** To provide a deluxe automotive interior, the engine tunnel, side walls and rear wall will be covered by a leather grain vinyl that is resistant to oil, grease, and mildew.
- 4.132.6** The headliner will be installed in both forward and rear cab sections. The headliner panel will be a composition of an aluminum panel covered with a sound barrier and upholstery.
- 4.132.7** The cab structure will include designated raceways for electrical harness routing from the front of the cab to the rear upper portion of the cab. Raceways will be extruded in the forward door frame, floor, walls and overhead in the area where the walls meet the ceiling. The raceways located in the floor will be covered by aluminum extrusion, while the vertical and overhead raceways will be covered by painted aluminum covers. The raceways will improve harness integrity by providing a continuous harness path that eliminates wire chafing and abrasion associated with exposed wiring or routing through drilled metal holes. Harnesses will be laid in place.
- 4.133 CAB INTERIOR UPHOLSTERY** - The cab interior upholstery will be 36 oz dark silver-gray vinyl. All cab interior materials will meet FMVSS 302 (flammability of interior materials).
- 4.134 CAB INTERIOR PAINT** - The following metal surfaces will be painted black, vinyl textured paint:
- 4.134.1** Modesty panel in front of driver
- 4.134.2** Vertical surface of dash in front of the officer (not applicable for recessed dash)
- 4.134.3** Glove box in front of the officer (if applicable)
- 4.134.4** Power distribution in front of the officer
- 4.134.5** Rear heater vent panels
- 4.134.6** The remaining cab interior metal surfaces will be painted fire smoke gray, vinyl texture paint.
- 4.135 CAB FLOOR** - The cab and crew cab floor areas will be covered with Polydamp™ acoustical floor mat consisting of a black pyramid rubber facing and closed cell foam decoupler.
- 4.135.1** The top surface of the material has a series of raised pyramid shapes evenly spaced, which offer a superior grip surface. Additionally, the material has a 0.25" thick closed cell foam (no water absorption) which offers a sound dampening material for reducing sound levels.
- 4.136 DEFROST/AIR CONDITIONING SYSTEM** - A ceiling mounted combination heater, defroster and air conditioning system will be installed in the cab above the engine tunnel area.

- 4.137 Cab Defroster** - A 54,000 BTU heater-defroster unit with 690 SCFM of air flow will be provided inside the cab. The heater-defrost will be installed in the forward portion of the cab ceiling. Air outlets will be strategically located in the cab header extrusion per the following:
- 4.137.1** One (1) adjustable will be directed towards the left side cab window.
 - 4.137.2** One (1) adjustable will be directed towards the right-side cab window.
 - 4.137.3** Six (6) fixed outlets will be directed at the windshield.
 - 4.137.4** The defroster will be capable of clearing 98 percent of the windshield and side glass when tested under conditions where the cab has been cold soaked at 0 degrees Fahrenheit for 10 hours, and a 2 ounce per square inch layer of frost/ice has been able to build up on the exterior windshield. The defroster system will meet or exceed SAE J382 requirements.
- 4.138 Cab/Crew Auxiliary Heater** - There will be no auxiliary heater provided in the rear facing seat risers.
- 4.139 Air Conditioning** - A 19.10 cubic inch compressor will be installed on the engine.
- 4.139.1** A roof-mounted condenser with a 78,000 BTU output at 2,400 SCFM that meets and exceeds the performance specification will be installed on the cab roof. The condenser cover and mounting legs must be painted white as provided by the A/C manufacturer.
 - 4.139.2** The air conditioning system will be capable of cooling the average cab temperature from 100 degrees Fahrenheit to 75 degrees Fahrenheit at 50 percent relative humidity within 30 minutes. The cooling performance test will be run only after the cab has been heat soaked at 100 degrees Fahrenheit for a minimum of 4 hours.
 - 4.139.3** The evaporator unit will be installed in the rear portion of the cab ceiling over the engine tunnel. The evaporator will include one (1) high performance heating core, one (1) high performance cooling core with (1) plenum directed to the front and one (1) plenum directed to the rear of the cab.
 - 4.139.4** The evaporator unit will have a 52,000 BTU at 690 SCFM rating that meets and exceeds the performance specifications.
 - 4.139.5** Adjustable air outlets will be strategically located on the forward plenum cover per the following:
 - 4.139.6** Four (4) will be directed towards the seating position on the left side of the cab.
 - 4.139.7** Four (4) will be directed towards the seating position on the right side of the cab.
 - 4.139.8** Adjustable air outlets will be strategically located on the evaporator cover per the following:
 - 4.139.9** Five (5) will be directed towards crew cab area.
 - 4.139.10** A high efficiency particulate air (HEPA) filter will be included for the system. Access to the filter cover will be secured with four (4) screws.
 - 4.139.11** The air conditioner refrigerant will be R-134A and will be installed by a certified technician.
- 4.140 Climate Control** - An automotive style controller will be provided to control the heat and air conditioning system within the cab. The controller will have three (3) functional knobs for fan speed, temperature, and air flow distribution (front to rear) control.
- 4.140.1** The system will control the temperature of the cab and crew cab automatically by pushing the center of the fan speed control knob. Rotate the center temperature control knob to set the cab and crew cab temperature.
 - 4.140.2** The AC system will be manually activated by pushing the center of the temperature control knob. Pushing the center of the air flow distribution knob will engage the AC for max defrost, setting the fan speeds to 100 percent and directing all air flow to the overhead forward position.
- 4.141 Gravity Drain Tubes** - Two (2) condensate drain tubes will be provided for the air conditioning evaporator. The drip pan will have two (2) drain tubes plumbed separately to allow for the condensate to exit the drip pan. No pumps will be provided.
- 4.141.1** The drain tubes will route through the rear facing center cabinet on the engine tunnel. The tubes running through the cabinet will be flexible and secured with p-clamps in the cabinet.
 - 4.141.2** The holes in the bottom of the cabinet will be finished with a plastic cap and the cap will be sealed with clear silicone.

- 4.142 FOAM GASKET BEHIND HEATER GRILLE** - A foam gasket will be provided around the edges of the heater grilles in the left and right-side rear facing seat risers.
- 4.143 SUN VISORS** - Two (2) smoked Lexan™ sun visors will be provided. The sun visors will be located above the windshield with one (1) mounted on each side of the cab. There will be no retention bracket provided to help secure each sun visor in the stowed position.
- 4.144 GRAB HANDLE** - A black rubber covered grab handle will be mounted on the door post of the driver side cab and passenger door to assist in entering the cab. The grab handle will be securely mounted to the post area between the door and windshield. A long rubber grab handle will be mounted on the dashboard in front of the officer.
- 4.145 ENGINE COMPARTMENT LIGHTS** - there will be one (1) Whelen®, model 3sc0cdcr, 12-volt dc, 3.00" white led light(s) with model 3flangeec, chrome flange kit(s) installed under the cab to be used as engine compartment illumination. These light(s) will be activated automatically when the cab is raised or when the dip stick door is opened.
- 4.146 ACCESS TO ENGINE DIPSTICKS** - for access to the engine oil and transmission fluid dipsticks, there will be a door on the engine tunnel, inside the crew cab. The door will be on the rear wall of the engine tunnel, on the vertical surface. The door will be 20.00" wide x 8.25" high and be flush with the wall of the engine tunnel. The engine oil dipstick will allow for checking only. The transmission dipstick will allow for both checking and filling. An additional port will be provided for filling the engine oil. The door will have a rubber seal for thermal and acoustic insulation. One (1) flush latch will be provided on the access door.
- 4.147 MAP BOX** - One (1) long map box with two (2) partitions will be installed to create a three (3) bin box open from top. The overall map box size will be 4 wide x 45 long x 8 deep and will then be divided into three (3) equal bins by use of permanent partitions.
- 4.147.1** The map box will be constructed of 0.125" aluminum and will be painted to match the cab interior.
- 4.147.2** There will be a quantity of one (1).
- 4.147.3** The map box will Mounted on forward wall of center EMS cabinet between driver and officer. Locate the top of the map box 3" down from the top of the cabinet, centered L/R. Add a fifth screw at the bottom of the center cutout and use foam gasket between box and EMS.
- 4.148 CAB SAFETY SYSTEM** - The cab will be provided with a safety system designed to protect occupants in the event of a side roll or frontal impact, and will include the following:
- 4.148.1** A supplemental restraint system (SRS) sensor will be installed on a structural cab member behind the instrument panel. The SRS sensor will perform real time diagnostics of all critical subsystems and will record sensory inputs immediately before and during a side roll or frontal impact event.
- 4.148.2** A slave SRS sensor will be installed in the cab to provide capacity for eight (8) crew cab seating positions.
- 4.148.3** A fault-indicating light will be provided on the vehicle's instrument panel allowing the driver to monitor the operational status of the SRS system.
- 4.148.4** A driver side front air bag will be mounted in the steering wheel and will be designed to protect the head and upper torso of the occupant, when used in combination with the 3-point seat belt.
- 4.148.5** A passenger side knee bolster air bag will be mounted in the modesty panel below the dash panel and will be designed to protect the legs of the occupant, when used in combination with the 3-point seat belt.
- 4.148.6** Air curtains will be provided in the outboard bolster of outboard seat backs to provide a cushion between occupant and the cab wall.
- 4.148.7** Suspension seats will be provided with devices to retract them to the lowest travel position during a side roll or frontal impact event.
- 4.148.8** Seat belts will be provided with pre-tensioners to remove slack from the seat belt during a side roll or frontal impact event.

4.149 FRONTAL IMPACT PROTECTION - The SRS system will provide protection during a frontal or oblique impact event. The system will activate when the vehicle decelerates at a predetermined G force known to cause injury to the occupants. The cab and chassis will have been subjected, via third party test facility, to a crash impact during frontal and oblique impact testing. Testing included all major chassis and cab components such as mounting straps for fuel and air tanks, suspension mounts, front suspension components, rear suspensions components, frame rail cross members, engine and transmission and their mounts, pump house and mounts, frame extensions and body mounts. The testing provided configuration specific information used to optimize the timing for firing the safety restraint system. The sensor will activate the pyrotechnic devices when the correct crash algorithm, wave form, is detected.

4.149.1 The SRS system will deploy the following components in the event of a frontal or oblique impact event:

4.149.2 Driver side front air bag

4.149.3 Passenger side knee bolster air bag

4.149.4 Air curtains mounted in the outboard bolster of outboard seat backs.

4.149.5 Suspension seats will be retracted to the lowest travel position.

4.149.6 Seat belts will be pre-tensioned to firmly hold the occupant in place.

4.150 SIDE ROLL PROTECTION - the SRS system will provide protection during a fast or slow 90-degree roll to the side, in which the vehicle comes to rest on its side. The system will analyze the vehicle's angle and rate of roll to determine the optimal activation of the advanced occupant restraints.

4.150.1 The SRS system will deploy the following components in the event of a side roll:

4.150.2 Air curtains mounted in the outboard bolster of outboard seat backs.

4.150.3 Suspension seats will be retracted to the lowest travel position.

4.150.4 Seat belts will be pre-tensioned to firmly hold the occupant in place.

4.151 SEATING CAPACITY - The seating capacity in the cab will be five (5).

4.152 DRIVER SEAT - A Pierce PS6® seat will be provided in the cab for the driver. The seat design will be a cam action type with air suspension. For increased convenience, the seat will include electric controls to adjust the rake (15 degrees), height (1.75" travel) and horizontal (7.00" travel) position. Electric controls will be located below the forward part of the seat cushion. To provide flexibility for multiple driver configurations, the seat will have a reclining back, adjustable from 20 degrees back to 45 degrees forward. Providing for maximum comfort, the seat back will be a high back style with manual lumbar adjustment lever, for lower back support, and will include minimum 7.50" deep side bolster pads for maximum support. The lumbar adjustment lever will be easily located at the lower outboard position of the seat cushion. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control).

4.152.1 The seat will include the following features incorporated into the side roll protection system:

4.152.2 Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.

4.152.3 A suspension seat safety system will be included. When activated in the event of a side roll, this system will pretension the seat belt and retract the seat to its lowest travel position.

4.152.4 The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

4.153 OFFICER SEAT - A Pierce PS6® seat will be provided in the cab for the officer. The seat will be a cam action type, with air suspension. For increased convenience, the seat will include a manual control to adjust the horizontal position (6.00" travel). The manual horizontal control will be a towel-bar style located below the forward part of the seat cushion. To provide flexibility for multiple passenger configurations, the seat will have a reclining back adjustable from 20 degrees back to 0 degrees forward. The seat back will be a high back style with manual lumbar adjustment lever and will include minimum 7.50" deep side bolster pads for maximum support. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat will be equipped with seat belt sensors in the seat cushion and belt receptacle that will activate an alarm indicating a seat is occupied but not buckled.

4.153.1 The seat will include the following features incorporated into the side roll protection system:

- 4.153.2** Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.
- 4.153.3** A suspension seat safety system will be included. When activated this system will pretension the seat belt and retract the seat to its lowest travel position.
- 4.153.4** The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.
- 4.154 REAR FACING LEFT SIDE CABINET** - A rear facing cabinet will be provided in the crew cab at the left side outboard position. The cabinet will be installed off of the edge of the seat riser.
- 4.154.1** The cabinet will be 20.00" wide x 30.00" high x 25.00" deep with one (1) Amdor rollup door with white finish, non-locking. The door will be a radius track style. That is, it will travel over the top and down the back of the cabinet. Front top corners of the cabinet will be radiused. This will allow access through the front and top section of the cabinet. The frame to frame will be 20.00" wide x 29.75" high. The minimum clear door opening will be 17.25" wide x 27.25" high.
- 4.154.2** A shield will be installed to keep items in this cabinet from falling into the door tracking area and jamming the door.
- 4.154.3** The cabinet will include one (1) infinitely adjustable shelf with a 0.75" up turned lip painted to match the cab interior.
- 4.154.4** The cabinet will include no louvers.
- 4.154.5** The cabinet will be constructed of smooth aluminum and painted to match the cab interior.
- 4.155 Cabinet Light** - There will be one (1) white LED strip light installed on the left side of the interior cabinet door opening. The lighting will be controlled by an automatic door switch.
- 4.156 REAR FACING RIGHT SIDE CABINET** - A rear facing cabinet will be provided in the crew cab at the right-side outboard position. The cabinet will be mounted off the edge of the seat riser.
- 4.156.1** The cabinet will be 20.00" wide x 30.00" high x 23.00" deep and will be provided with an access panel that screws into place. There will be ventilation holes provided in the access panel. A foam gasket will be provided around the edges of the panel.
- 4.156.2** The cabinet will include no adjustable shelves or trays in the cabinet interior.
- 4.156.3** The cabinet will include no louvers.
- 4.156.4** The cabinet will be constructed of smooth aluminum and painted to match the cab interior.
- 4.157 FORWARD FACING DRIVER SIDE OUTBOARD SEAT** - There will be one (1) forward facing, Pierce PS6® seat provided at the driver side outboard position in the crew cab. The seat back will be a high back style with 7.5 degree fixed recline angle and will include minimum 7.50" deep side bolster pads for maximum support. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat will be equipped with seat belt sensors in the seat cushion and belt receptacle that will activate an alarm indicating a seat is occupied but not buckled.
- 4.157.1** The seat will be mounted an additional 3.00" inboard from standard.
- 4.157.2** The seat will include the following features incorporated into the side roll protection system:
- 4.157.3** Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.
- 4.157.4** A seat safety system will be included. When activated, this system will pretension the seat belt around the occupant to firmly hold them in place in the event of a side roll.
- 4.157.5** The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

- 4.158 FORWARD FACING CENTER SEAT** - There will be one (1) forward facing, Pierce PS6® seat provided at the center position in the crew cab. The seat back will be a high back style with 7.5 degree fixed recline angle and will include minimum 7.50" deep side bolster pads for maximum support. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat will be equipped with seat belt sensors in the seat cushion and belt receptacle that will activate an alarm indicating a seat is occupied but not buckled.
- 4.158.1** The seat will include the following feature incorporated into the side roll protection system:
- 4.158.2** A seat safety system will be included. When activated this system will pretension the seat belt around the occupant to firmly hold them in place in the event of a side roll.
- 4.158.3** The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.
- 4.159 FORWARD FACING PASSENGER SIDE OUTBOARD SEAT** - There will be one (1) forward facing, Pierce PS6® seat provided at the passenger side outboard position in the crew cab. The seat back will be a high back style with 7.50 degree fixed recline angle and will include minimum 7.50" deep side bolster pads for maximum support. For optimal comfort, the seat will be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat will be equipped with seat belt sensors in the seat cushion and belt receptacle, that will activate an alarm indicating a seat is occupied but not buckled.
- 4.159.1** The seat will be mounted an additional 3.00" inboard from standard.
- 4.159.2** The seat will include the following features incorporated into the side roll protection system:
- 4.159.3** Side air curtain will be mounted integral to the outboard bolster of the seat back. The air curtain will be covered by a decorative panel when in the stowed position.
- 4.159.4** A seat safety system will be included. When activated, this system will pretension the seat belt around the occupant to firmly hold them in place in the event of a side roll.
- 4.159.5** The seat will be furnished with a 3-point, shoulder type seat belt. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.
- 4.160 EMS COMPARTMENTS** - The rear facing EMS compartments will be stacked side by side by side, secured to each other with bolts to prevent rattling. The center compartment and driver's side compartment will be moved off center towards the passenger's side to allow them to all be tight together.
- 4.161 REAR FACING CENTER CABINET** - A rear facing cabinet will be provided on the top rear of the engine tunnel. The front edge of the cabinet will be even with the rear edge of the engine tunnel.
- 4.161.1** The cabinet will be 47.50" wide x 20.50" high x 17.75" deep at the bottom and 20.00" deep at the top. The interior door will be web netting. The netting must be made with 1.00" wide nylon material with 2.00" openings. The nylon webbing will be permanently fastened at the bottom side of the cabinet and have 1.00" side release fasteners on the opposite side to secure it. The clear door opening of the cabinet will be 45.00" wide x 17.50" high.
- 4.161.2** A permanent vertical partition will be provided on the left side of the cabinet. The partition will be mounted to provide an 18.00" wide clear opening on the left side of the cabinet.
- 4.161.3** The cabinet will include one (1) infinitely adjustable shelf with a 0.75" up turned lip painted to match the cab interior. The shelf will be located centered above engine tunnel.
- 4.161.4** The cabinet will include no louvers.
- 4.161.5** The cabinet will be constructed of smooth aluminum and painted to match the cab interior.
- 4.162 CABINET LIGHT** - There will be one (1) white LED strip light installed on the right side of the interior cabinet door opening and one (1) white LED strip light installed on the left side of the interior cabinet door opening. The lighting will be controlled by a rocker switch on the front of the cabinet.
- 4.163 REAR FACING OVERHEAD STORAGE COMPARTMENT** - There will be two (2) overhead rear facing storage compartments installed at the raised roof within the crew cab, on each side of the air conditioner. The compartments will be approximately 22.00" wide x 10.00" high x 34.00" deep at the bottom.

- 4.163.1** Each compartment will include one (1) drop down compartment door. A locking push button combination latch will be provided. The flange will be as small as possible to create the largest clear door opening. The compartment door will open 180 degrees.
- 4.163.2** The compartment will be constructed of smooth aluminum and painted to match the cab interior.
- 4.164 COMPARTMENT LIGHT** - The storage compartment lighting will consist of one (1) white LED strip light installed horizontally above each compartment door opening.
- 4.165 CAB COMPARTMENT LIGHTING** - There will be one (1) Pierce 20.00" LED compartment light strip(s) provided in passenger side rear facing EMS compartment. Mount the switch like 30782 on the outside by the cab door. A switch provided passenger side rear facing EMS compartment. Mount the switch like 30782 on the outside by the cab door will turn compartment lighting on.
- 4.166 SEAT UPHOLSTERY** - All seat upholstery will be gray Turnout Tuff material.
- 4.167 SEAT BELTS** - All seating positions in the cab, crew cab and tiller cab (if applicable) will have red seat belts.
- 4.167.1** To provide quick, easy use for occupants wearing bunker gear, the female buckle and seat belt webbing length will meet or exceed the current edition of NFPA 1901 and CAN/ULC - S515 standards.
- 4.167.2** The 3-point shoulder type seat belts will also include the ReadyReach D-loop assembly to the shoulder belt system. The ReadyReach feature adds an extender arm to the D-loop location placing the D-loop in a closer, easier to reach location.
- 4.167.3** Any flip up seats will include a 3-point shoulder type belts only.
- 4.167.4 SHOULDER HARNESS HEIGHT ADJUSTMENT** - All seating positions furnished with 3-point shoulder type seat belts will include a height adjustment. This adjustment will optimize the belts effectiveness and comfort for the seated firefighter. A total of five (5) seating positions will have the adjustable shoulder harness.
- 4.168 HELMET STORAGE** - Helmet storage will be located in a fully enclosed and latched cab compartment.
- 4.169 CAB DOME LIGHTS** - There will be four (4) Whelen, Model 60C*EGCS, 6.00" round dual LED dome lights provided. Two (2) lights will be mounted above the inside shoulder of the driver and officer and two (2) lights will be installed and located, one (1) on each side of the crew cab.
- 4.169.1** The color of the LED's will be red and white.
- 4.169.2** The white LED's will be controlled by the lens switch.
- 4.169.3** The color LED's will be controlled by the door switches and the lens switch.
- 4.170 ADDITIONAL DOME LIGHTS** - There will be one (1) 6.00" round Whelen, Model 60CREGCS white and red LED dome light installed in the cab located centered in the ceiling panel in front of the center seat, standard lights mounted to the outside edge of the inner panels, all three in a straight row, match 31672.
- 4.170.1** The red light will be controlled by the door switch and a switch on the light.
- 4.170.2** The white light will be controlled by the switch on the light.
- 4.171 OVERHEAD MAP LIGHTS** - There will be two (2) Peterson, Model M371S, rectangular LED adjustable map lights installed in the cab:
- 4.171.1** One (1) overhead in front of the driving position.
- 4.171.2** One (1) overhead in front of the passenger's position.
- 4.171.3** Each light will include a switch on the light housing.
- 4.171.4** The light switches will be energized when the spare wire cut off switch is on.

- 4.172 HANDHELD SPOTLIGHT** - There will be four (4) Streamlight, Model Survivor 90503, LED flashlights with chargers and AC/DC chords provided and installed one each side in the front of the cab to the rear of the cab door on the horizontal threshold, as far to the rear as possible and two in the rear crew cab area on the wire cover at the ceiling, match 33103.
- 4.173 POWER TO HANDHELD SPOTLIGHT** - The 12 volt DC power to recharge the hand lights will be from the spare wire fuse panel located Front lights mount on the angled section toward the rear door frame each side DS and PS front- Rear lights to match 28165 hanging from the ceiling an1 E-flood mount on DS EMS compt. to match 28165, 29674, 29756, 30782.
- 4.174 HANDHELD LIGHT** - There will be one (1) Streamlight E-Flood, LiteBox, Model 45665, LED hand held flashlight(s) with an orange thermoplastic body provided and located on the d-s ems box top. see photo, match 33103. The wire will be run on the exterior of the compartment under the mounting plate, to the rear, then down. The system will include the handlight, shoulder strap, and direct wire vehicle mount system.
- 4.175 CAB INSTRUMENTATION** - The cab instrument panel will consist of gauges, an LCD display, telltale indicator lights, alarms, control switches, and a diagnostic panel. The function of instrument panel controls and switches will be identified by a label adjacent to each item. Actuation of the headlight switch will illuminate the labels in low light conditions. Telltale indicator lamps will not be illuminated unless necessary. The cab instruments and controls will be conveniently located within the forward cab section directly forward of the driver. Gauge and switch panels will be designed to be removable for ease of service and low cost of ownership.
- 4.176 Gauges** - The gauge panel will include the following ten (10) ivory gauges with chrome bezels to monitor vehicle performance:
- 4.176.1** Voltmeter gauge (Volts)
 - 4.176.2** Low volts (11.8 VDC) - Amber indicator on gauge assembly with alarm
 - 4.176.3** High volts (15 VDC) - Amber indicator on gauge assembly with alarm
 - 4.176.4** Very low volts (11.3 VDC) - Amber indicator on gauge assembly with alarm
 - 4.176.5** Very high volts (16 VDC) - Amber indicator on gauge assembly with alarm
 - 4.176.6** Tachometer (RPM)
 - 4.176.7** Speedometer (Primary (outside) MPH, Secondary (inside) Km/H)
 - 4.176.8** Fuel level gauge (Empty - Full in fractions)
 - 4.176.9** Low fuel (1/8 full) Amber indicator on gauge assembly with alarm –
 - 4.176.10** Very low fuel (1/32) fuel Amber indicator on gauge assembly with alarm
 - 4.176.11** Engine oil pressure gauge (PSI) - Low oil pressure to activate engine warning lights and alarms.
 - 4.176.12** Red indicator on gauge assembly with alarm
 - 4.176.13** Front air pressure gauge (PSI)
 - 4.176.14** Low air pressure to activate warning lights and alarm.
 - 4.176.15** Red indicator on gauge assembly with alarm
 - 4.176.16** Rear air pressure gauge (PSI)
 - 4.176.17** Low air pressure to activate warning lights and alarm.
 - 4.176.18** Red indicator on gauge assembly with alarm
 - 4.176.19** Transmission oil temperature gauge (Fahrenheit)
 - 4.176.20** High transmission oil temperature activates warning lights and alarm.
 - 4.176.21** Amber indicator on gauge assembly with alarm
 - 4.176.22** Engine coolant temperature gauge (Fahrenheit)
 - 4.176.23** High engine temperature activates an engine warning light and alarm.
 - 4.176.24** Red indicator on gauge assembly with alarm
 - 4.176.25** Diesel Exhaust Fluid Level Gauge (Empty - Full in fractions)
 - 4.176.26** Low fluid (1/8 full)
 - 4.176.27** Amber indicator on gauge assembly with alarm
 - 4.176.28** All gauges and gauge indicators will perform prove out at initial power-up to ensure proper performance.

4.177 Indicator Lamps - To promote safety, the following telltale indicator lamps will be integral to the gauge assembly and are located above and below the center gauges. The indicator lamps will be "dead front" design that is only visible when active. The colored indicator lights will have descriptive text or symbols.

4.177.1 The following amber telltale lamps will be present:

4.177.2 Low coolant

4.177.3 Trac cntl (traction control) (where applicable)

4.177.4 Check engine.

4.177.5 Check trans (check transmission)

4.177.6 Aux brake overheat (Auxiliary brake overheat)

4.177.7 Air rest (air restriction)

4.177.8 Caution (triangle symbol)

4.177.9 Water in fuel

4.177.10 DPF (engine diesel particulate filter regeneration)

4.177.11 Trailer ABS (where applicable)

4.177.12 Wait to start (where applicable)

4.177.13 HET (engine high exhaust temperature) (where applicable)

4.177.14 ABS (antilock brake system)

4.177.15 MIL (engine emissions system malfunction indicator lamp) (where applicable)

4.177.16 SRS (supplemental restraint system) fault (where applicable)

4.177.17 DEF (low diesel exhaust fluid level)

4.177.18 The following red telltale lamps will be present:

4.177.19 Warning (stop sign symbol)

4.177.20 Seat belt

4.177.21 Parking brake

4.177.22 Stop engine.

4.177.23 Rack down

4.177.24 The following green telltale lamps will be provided:

4.177.25 Left turn.

4.177.26 Right turn

4.177.27 Battery on

4.177.28 The following blue telltale lamp will be provided:

4.177.29 High beam

4.178 ALARMS

4.178.1 Audible steady tone warning alarm: A steady audible tone alarm will be provided whenever a warning message is present.

4.178.2 Audible pulsing tone caution alarm: A pulsing audible tone alarm (chime/chirp) will be provided whenever a caution message is present without a warning message being present.

4.178.3 Alarm silence: Any active audible alarm will be able to be silenced by holding the ignition switch at the top position for 3 to 5 seconds. For improved safety, silenced audible alarms will intermittently chirp every 30 seconds until the alarm condition no longer exists. The intermittent chirp will act as a reminder to the operator that a caution or warning condition still exists. Any new warning or caution condition will enable the steady or pulsing tones respectively.

4.178.4 Indicator Lamp and Alarm Prove-Out

4.178.5 Telltale indicators and alarms will perform prove-out at initial power-up to ensure proper performance.

4.179 CONTROL SWITCHES

4.179.1 For ease of use, the following controls will be provided immediately adjacent to the cab instrument panel within easy reach of the driver.

4.179.2 Emergency master switch: A molded plastic push button switch with integral indicator lamp will be provided. Pressing the switch will activate emergency response lights and siren control. A green lamp on the switch provides indication that the emergency master mode is active. Pressing the switch again disables the emergency master mode.

- 4.179.3** Headlight / Parking light switch: A three (3)-position maintained rocker switch will be provided. The first switch position will deactivate all parking lights and the headlights. The second switch position will activate the parking lights. The third switch position will activate the headlights.
- 4.179.4** Panel backlighting intensity control switch: A three (3)-position momentary rocker switch will be provided. The first switch position decreases the panel backlighting intensity to a minimum level as the switch is held. The second switch position is the default position that does not affect the backlighting intensity. The third switch position increases the panel backlighting intensity to a maximum level as the switch is held.
- 4.179.5** The following standard controls will be integral to the gauge assembly and are located below the right-hand gauges. All switches have backlit labels for low light applications.
- 4.179.6** High idle engagement switch: A two (2)-position momentary rocker switch with integral indicator lamp will be provided. The first switch position is the default switch position. The second switch position will activate and deactivate the high idle function when pressed and released. The "Ok to Engage High Idle" indicator lamp must be active for the high idle function to engage. A green indicator lamp integral to the high idle engagement switch will indicate when the high idle function is engaged.
- 4.179.7** "Ok To Engage High Idle" indicator lamp: A green indicator light will be provided next to the high idle activation switch to indicate that the interlocks have been met to allow high idle engagement.
- 4.179.8** The following standard controls will be provided adjacent to the cab gauge assembly within easy reach of the driver. All switches will have backlit labels for low light applications.
- 4.179.9** Ignition switch: A three (3)-position maintained/momentary rocker switch will be provided. The first switch position will deactivate vehicle ignition. The second switch position will activate vehicle ignition. The third momentary position will disable the Command Zone audible alarm if held for 3 to 5 seconds. A green indicator lamp will be activated with vehicle ignition.
- 4.179.10** Engine start switch: A two (2)-position momentary rocker switch will be provided. The first switch position is the default switch position. The second switch position will activate the vehicle's engine. The switch actuator is designed to prevent accidental activation.
- 4.179.11** 4-way hazard switch: A two (2)-position maintained rocker switch will be provided. The first switch position will deactivate the 4-way hazard switch function. The second switch position will activate the 4-way hazard function. The switch actuator will be red and includes the international 4-way hazard symbol.
- 4.179.12** Heater, defroster, and optional air conditioning control panel: A control panel with membrane switches will be provided to control heater/defroster temperature and heater, defroster, and air conditioning fan speeds. A green LED status bar will indicate the relative temperature and fan speed settings.
- 4.179.13** Turn signal arm: A self-canceling turn signal with high beam headlight and windshield wiper/washer controls will be provided. The windshield wiper control will have high, low, and intermittent modes.
- 4.179.14** Parking brake control: An air actuated push/pull park brake control valve will be provided.
- 4.179.15** Chassis horn control: Activation of the chassis horn control will be provided through the center of the steering wheel.
- 4.180 CUSTOM SWITCH PANELS** - The design of cab instrumentation will allow for emergency lighting and other switches must be placed within easy reach of the operator thus improving safety. There will be positions for up to four (4) switch panels in the overhead console on the driver's side, up to four (4) switch panels in the engine tunnel console facing the driver, up to four (4) switch panels in the overhead console on the officer's side and up to two (2) switch panels in the engine tunnel console facing the officer. All switches will have backlit labels for low light applications.
- 4.181 DIAGNOSTIC PANEL**- A diagnostic panel will be accessible while standing on the ground and located inside the driver's side door left of the steering column. The diagnostic panel will allow diagnostic tools such as computers to connect to various vehicle systems for improved troubleshooting providing a lower cost of ownership. Diagnostic switches will allow ABS systems to provide blink codes should a problem exist.
- 4.181.1** The diagnostic panel will include the following:
- 4.181.2** Engine diagnostic port
- 4.181.3** Transmission diagnostic port
- 4.181.4** ABS diagnostic port
- 4.181.5** SRS diagnostic port (where applicable)
- 4.181.6** Command Zone USB diagnostic port
- 4.181.7** ABS diagnostic switch (blink codes flashed on ABS telltale indicator)

- 4.181.8 Diesel particulate filter regeneration switch (where applicable)
- 4.181.9 Diesel particulate filter regeneration inhibit switch (where applicable)

4.182 CAB LCD DISPLAY - A digital four (4)-row by 20-character dot matrix display will be integral to the gauge panel. The display will be capable of showing simple graphical images as well as text. The display will be split into three (3) sections. Each section will have a dedicated function. The upper left section will display the outside ambient temperature. The upper right section will display, along with other configuration specific information:

- 4.182.1 Odometer
- 4.182.2 Trip mileage
- 4.182.3 PTO hours
- 4.182.4 Fuel consumption
- 4.182.5 Engine hours
- 4.182.6 The bottom section will display INFO, CAUTION, and WARNING messages. Text messages will automatically activate to describe the cause of an audible caution or warning alarm. The LCD will be capable of displaying multiple text messages should more than one caution or warning condition exist.
- 4.182.7 **AIR RESTRICTION INDICATOR** - A high air restriction warning indicator light LCD message with amber warning indicator and audible alarm will be provided.
- 4.182.8 **DO NOT MOVE APPARATUS" INDICATOR** - A flashing red indicator light, located in the driving compartment, will be illuminated automatically per the current NFPA requirements. The light will be labeled "Do Not Move Apparatus If Light Is On."
- 4.182.9 The same circuit that activates the Do Not Move Apparatus indicator will activate a steady tone alarm when the parking brake is released.
- 4.182.10 **DO NOT MOVE TRUCK MESSAGES** -Messages will be displayed on the Command Zone™, color display located within sight of the driver whenever the Do Not Move Truck light is active. The messages will designate the item or items not in the stowed for vehicle travel position (parking brake disengaged).
- 4.182.11 The following messages will be displayed (where applicable):
- 4.182.12 Do Not Move Truck
- 4.182.13 DS Cab Door Open (Driver Side Cab Door Open)
- 4.182.14 PS Cab Door Open (Passenger's Side Cab Door Open)
- 4.182.15 DS Crew Cab Door Open (Driver Side Crew Cab Door Open)
- 4.182.16 PS Crew Cab Door Open (Passenger's Side Crew Cab Door Open)
- 4.182.17 DS Body Door Open (Driver Side Body Door Open)
- 4.182.18 PS Body Door Open (Passenger's Side Body Door Open)
- 4.182.19 Rear Body Door Open
- 4.182.20 Deck Gun Not Stowed
- 4.182.21 Steps Not Stowed - Any other device that is opened, extended, or deployed that creates a hazard or is likely to cause major damage to the apparatus if the apparatus is moved will be displayed as a caution message after the parking brake is disengaged.

4.183 SWITCH PANELS - The emergency light switch panel will have a master switch for ease of use plus individual switches for selective control. Each switch panel will contain eight (8) membrane-type switches each rated for one million (1,000,000) cycles. Panels containing less than eight (8) switch assignments will include non-functioning black appliques. Documentation will be provided by the manufacturer indicating the rated cycle life of the switches. The switch panel(s) will be located in the overhead position above the windshield on the driver side overhead to allow for easy access.

- 4.183.1 Additional switch panel(s) will be located in the overhead position(s) above the windshield or in designated locations on the lower instrument panel layout.
- 4.183.2 The switches will be membrane-type and also act as an integral indicator light. For quick, visual indication the entire surface of the switch will be illuminated white whenever back lighting is activated and illuminated green whenever the switch is active. An active illuminated switch will flash when interlock requirements are not met or device is actively being load managed. For ease of use, a two (2)-ply, scratch resistant laser engraved Gravoply label indicating the use of each switch will be placed in the center of the switch. The label will allow light to pass through the letters for ease of use in low light conditions.

- 4.184 WIPER CONTROL** - for simple operation and easy reach, the windshield wiper control will be an integral part of the directional light lever located on the steering column. The wiper control will include high and low wiper speed settings, a one (1)-speed intermittent wiper control and windshield washer switch. The control will have a "return to park" provision, which allows the wipers to return to the stored position when the wipers are not in use.
- 4.185 SPARE CIRCUIT** - There will be a Cole Hersee part number 75908 disconnect switch installed in the spare wire circuit(s) to connect or disconnect the power to the spare wire(s) located the blue sea junction boxes in the PS rear facing cabinet. The label and switch will be installed to the lower right side of the steering wheel, match 29756, and 29674, 307821, 31672.
- 4.186 SPARE CIRCUIT** - There will be one (1) pair of wires, including a positive and a negative, installed on the apparatus.
- 4.186.1** The above wires will have the following features:
 - 4.186.2** The positive wire will be connected directly to the battery power.
 - 4.186.3** The negative wire will be connected to ground.
 - 4.186.4** Wires will be protected to 15 amps at 12 volts DC.
 - 4.186.5** Power and ground will terminate switch panel #9. All must be wired to the in/out service switch thru the blue sea junction box.
 - 4.186.6** Termination will be with 15 amps, power point plug with rubber cover.
 - 4.186.7** Wires will be sized to 125 percent of the protection.
 - 4.186.8** The circuit(s) may be load managed when the parking brake is set.
- 4.187 SPARE CIRCUIT** - There will be three (3) pair of wires, including a positive and a negative, installed on the apparatus.
- 4.187.1** The above wires will have the following features:
 - 4.187.2** The positive wire will be connected to the auxiliary switch located on the instrument panel to the right of the steering wheel, option 614250.
 - 4.187.3** The negative wire will be connected to ground.
 - 4.187.4** Wires will be protected to 60 amps at 12 volts DC.
 - 4.187.5** Power and ground will terminate in the passenger side radio compartment in the crew cab, all flashlights, power points, radios and charger, rocket modem must be connected to these terminal strips.
 - 4.187.6** Termination will be to a Blue Sea System, model 5026, 12 circuit with negative bus bar, straight blade fuse block. The terminal block will include a cover with circuit labels.
 - 4.187.7** Wires to the fuse block will be sized to 125% of the protection.
 - 4.187.8** This circuit(s) may be load managed when the parking brake is applied.
- 4.188 SPARE CIRCUIT** - There will be one (1) pair of wires, including a positive and a negative, installed on the apparatus.
- 4.188.1** The above wires will have the following features:
 - 4.188.2** The positive wire will be connected directly to the battery power.
 - 4.188.3** The negative wire will be connected to ground.
 - 4.188.4** Wires will be protected to 15 amps at 12 volts DC.
 - 4.188.5** Power and ground will terminate in the overhead switch panel centered above officer, wiring must be connected to the in service / out of service switch.
 - 4.188.6** Termination will be with heat shrinkable butt splicing.
 - 4.188.7** Wires will be sized to 125 percent of the protection.
 - 4.188.8** This circuit(s) may be load managed when the parking brake is set.
- 4.189 SPARE CIRCUIT** - There will be two (2) pair of wires, including a positive and a negative, installed on the apparatus.
- 4.189.1** The above wires will have the following features:
 - 4.189.2** The positive wire will be connected directly to the battery power.
 - 4.189.3** The negative wire will be connected to ground.
 - 4.189.4** Wires will be protected to 15 amps at 12 volts DC.

- 4.189.5 Power and ground will terminate one each side under the open top, 3 slot map box, mounted to the center EMS compt. Make sure these are connected to the Blue Sea junction boxes. Make sure the back side of the connection is covered, Move inboard to under the partition for the map slots.
 - 4.189.6 Termination will be with 15 amps, power point plug with rubber cover.
 - 4.189.7 Wires will be sized to 125 percent of the protection.
 - 4.189.8 This circuit(s) may be load managed when the parking brake is set.
- 4.190 SPARE CIRCUIT** - There will be one (1) dual USB fast charge socket mounts installed on the apparatus. The above wires will have the following features:
- 4.190.1 The positive wire will be connected directly to the battery power.
 - 4.190.2 The negative wire will be connected to ground.
 - 4.190.3 Wires will be protected to 4.8 amps at 12 volts DC.
 - 4.190.4 The USB socket mount will be switch panel #9, match 30782, 31672.
 - 4.190.5 Termination will be a Blue Sea Systems part number 1045 dual USB charger socket.
 - 4.190.6 Wires will be sized to 125% of the protection.
 - 4.190.7 This circuit(s) may be load managed when the parking brake is applied.
- 4.191 SPARE CIRCUIT** - there will be one (1) pair of wires, including a positive and a negative, installed on the apparatus.
- 4.191.1 The above wires will have the following features:
 - 4.191.2 The positive wire will be connected directly to the battery power.
 - 4.191.3 The negative wire will be connected to ground.
 - 4.191.4 Wires will be protected to 40 amps at 12 volts DC.
 - 4.191.5 Power and ground will terminate PS ems rear facing cabinet.
 - 4.191.6 Termination will be with 3/8" studs and plastic covers.
 - 4.191.7 Wires will be sized to 125 percent of the protection.
 - 4.191.8 This circuit(s) may be load managed when the parking brake is set.
- 4.192 SPARE CIRCUIT** - There will be two (2) pair of wires, including a positive and a negative, installed on the apparatus.
- 4.192.1 The above wires will have the following features:
 - 4.192.2 The positive wire will be connected directly to the battery power.
 - 4.192.3 The negative wire will be connected to ground.
 - 4.192.4 Wires will be protected to 15 amps at 12 volts DC.
 - 4.192.5 Power and ground will terminate One in DS rear facing EMS compt. mounted at the top, and one in the center rear facing EMS box must be mounted PS rear shelf track. All must be wired to the in/out service switch thru the blue sea junction box.
 - 4.192.6 Termination will be with 15-amp, power point plug with rubber cover.
 - 4.192.7 Wires will be sized to 125 percent of the protection.
 - 4.192.8 This circuit(s) may be load managed when the parking brake is set.
- 4.193 EMERGENCY LIGHT SWITCHES** - The emergency light switching will work as follows: The emergency master switch must be activated for all emergency lighting to function.
- 4.193.1 The emergency master "saved states" feature will not be activated. This means that if the emergency master switch is on and individual switch is turned off. Then the emergency master is turned off, upon turning the emergency master switch back on the individual switch which was previously turn off will turn back on.
 - 4.193.2 All emergency lighting will be turned on whenever the emergency master switch is turned on.
 - 4.193.3 Individual emergency light switches may be deactivated and/or reactivated after the emergency master switch is turned on.
 - 4.193.4 Switches will be per the following: Emergency Master, Lightbar, Front Warning, Side Warning, Rear Warning, High Beam Flash will be combined with Front Warning, Upper & Lower Rear Warning will be combined under Rear Warning.

- 4.194 STEREO RADIO** - A Jensen, heavy duty AM/FM/CD/Weatherband stereo radio, with front auxiliary input will be installed per switch panel layout. There will be 5.25" speakers installed one (1) pair of 5.25" speakers in the cab and one (1) pair of 5.25" speakers in the crew cab. The antenna will be a roof-mounted rubber antenna located in an open space, on the cab roof.
- 4.195 SWITCH, MASTER, AM/FM RADIO** - There will be a remote switch provided inside the cab to control the AM/FM radio. The switch will be installed in reach of the driver per switch panel layout. The radio will automatically turn on with when the battery switch is turned on.
- 4.196 PUSH BUTTON MOUNTING BRACKET** - A mounting bracket will be provided chrome buttons will be in the wedge bracket near the officer. Match to job 29765 and 29674, 30782. They will be located near inboard edge by the center console with wiring coming from below the engine tunnel mount plate for the mounting of push button controls. The mounting bracket will be large enough for three (3) push buttons. The controls and labels will be mounted horizontally, next to each other. The bracket will be fabricated from smooth aluminum and painted to match work surface.
- 4.197 INFORMATION CENTER** - An information center employing a 7.00" diagonal touch screen color LCD display will be encased in an ABS plastic housing.
- 4.198 General Screen Design** - Where possible, background colors will be used to provide "At a Glance" vehicle information. If information provided on a screen is within acceptable limits, a green background will be used.
- 4.198.1** If a caution or warning situation arises the following will occur:
- 4.198.2** An amber background/text color will indicate a caution condition.
- 4.198.3** A red background/text color will indicate a warning condition.
- 4.198.4** The information center will utilize an "Alert Center" to display text messages for audible alarm tones. The text messages will be written to identify the item(s) causing the audible alarm to sound. If more than one (1) text message occurs, the messages will cycle every second until the problem(s) have been resolved. The background color for the "Alert Center" will change to indicate the severity of the "warning" message. If a warning and a caution condition occur simultaneously, the red background color will be shown for all alert center messages.
- 4.198.5** A label for each button will exist. The label will indicate the function for each active button for each screen. Buttons that are not utilized on specific screens will have a button label with no text or symbol.
- 4.198.6** Home/Transit Screen
- 4.198.7** This screen will display the following:
- 4.198.8** Vehicle Mitigation (if equipped)
- 4.198.9** Water Level (if the water level system includes compatible communications to the information center)
- 4.198.10** Foam Level (if the foam level system includes compatible communications to the information center)
- 4.198.11** Seat Belt Monitoring Screen
- 4.198.12** Tire Pressure Monitoring (if equipped)
- 4.198.13** Digital Speedometer
- 4.198.14** Active Alarms
- 4.198.15** On Scene Screen
- 4.198.16** This screen will display the following and will be auto activated with pump engaged (if equipped):
- 4.198.17** Battery Voltage
- 4.198.18** Fuel
- 4.198.19** Oil Pressure
- 4.198.20** Coolant Temperature
- 4.198.21** RPM
- 4.198.22** Water Level (if equipped)
- 4.198.23** Foam Level (if equipped)
- 4.198.24** Foam Concentration (if equipped)
- 4.198.25** Water Flow Rate (if equipped)
- 4.198.26** Water Used (if equipped)

- 4.198.27 Active Alarms
 - 4.198.28 Virtual Buttons - There will be four (4) virtual switch panel screens that match the overhead and lower lighting and HVAC switch panels.
- 4.199 COLLISION MITIGATION** - There will be a HAAS ALERT®, model ha5 responder-to-vehicle (r2v) collision avoidance system provided on the apparatus. The ha5 cellular transponder module will be installed behind the cab windshield, as high and near to the center as practical, to allow clear visibility to the sky. The module dimensions are 5.40" long x 2.70" wide x 1.30" high, and operating temperature range is -40 degree C to 85-degree C.
- 4.199.1 The transponder will be connected to the vehicle's emergency master circuit and battery direct power and ground.
 - 4.199.2 While responding with emergency lights on, the HA5 transponder sends alert messages via cellular network to motorists in the vicinity of the responding truck that are equipped with the WAZE app.
 - 4.199.3 While on scene with emergency lights on, the HA5 transponder sends road hazard alerts to motorists in the vicinity of the truck that are equipped with the WAZE app.
 - 4.199.4 The HA5 Responder-to-Vehicle (R2V) collision avoidance system will include the transponder and a 5-year cellular plan subscription.
- 4.200 VEHICLE DATA RECORDER** - there will be a vehicle data recorder (VDR) capable of reading and storing vehicle information provided. The information stored on the VDR can be downloaded through a USB port mounted in a convenient location determined by cab model. A USB cable can be used to connect the VDR to a laptop to retrieve required information. The program to download the information from the VDR will be available to download on-line. The vehicle data recorder will be capable of recording the following data via hardwired and/or can inputs:
- 4.200.1 Vehicle Speed - MPH
 - 4.200.2 Acceleration - MPH/sec
 - 4.200.3 Deceleration - MPH/sec
 - 4.200.4 Engine Speed - RPM
 - 4.200.5 Engine Throttle Position - % of Full Throttle
 - 4.200.6 ABS Event - On/Off
 - 4.200.7 Seat Occupied Status - Yes/No by Position
 - 4.200.8 Seat Belt Buckled Status - Yes/No by Position
 - 4.200.9 Master Optical Warning Device Switch - On/Off
 - 4.200.10 Time - 24 Hour Time
 - 4.200.11 Date - Year/Month/Day
- 4.201 Seat Belt Monitoring System** - A seat belt monitoring system (SBMS) will be provided on the Command Zone™ color display and in the center overhead of the cab instrument panel. The SBMS will be capable of monitoring up to 10 seating positions indicating the status of each seat position per the following:
- 4.201.1 Seat Occupied & Buckled = Green LED indicator illuminated
 - 4.201.2 Seat Occupied & Unbuckled = Red LED indicator with audible alarm
 - 4.201.3 No Occupant & Buckled = Red LED indicator with audible alarm
 - 4.201.4 No Occupant & Unbuckled = No indicator and no alarm
 - 4.201.5 The seat belt monitoring screen will become active on the Command Zone color display when:
 - 4.201.6 The home screen is active:
 - 4.201.7 and there is any occupant seated but not buckled or any belt buckled with an occupant.
 - 4.201.8 and there are no other Do Not Move Apparatus conditions present. As soon as all Do Not Move Apparatus conditions are cleared, the SBMS will be activated.
 - 4.201.9 The SBMS will include an audible alarm that will warn that an unbuckled occupant condition exists, and the parking brake is released, or the transmission is not in park.
- 4.202 INTERCOM SYSTEM** - there will be digital, single radio interface, intercom located in the cab. The front panel will have master volume, and squelch controls with illuminated indicators, allowing for independent level setting of radio and auxiliary audio devices.

- 4.202.1** There will be one (1) radio listen only / transmit control with select, monitor, receive, and transmit indicators.
There will be one (1) auxiliary audio input with select and receive indicators.
- 4.202.2** There will be one (1) wireless base station for up to five (1-5) headset users provided.
- 4.202.3** The wireless base station will have a 100' to 1100' range, line of sight. Objects between the transmitter and receiver affect range.
- 4.202.4** The following Firecom components will be provided:
- 4.202.5** One (1) 5100D Intercom
- 4.202.6** One (1) WB505R wireless base station (1-5 wireless positions)
- 4.202.7** All necessary power and station cabling
- 4.203 WIRELESS UNDER HELMET, RADIO TRANSMIT ONLY HEADSET** - There will be four (4) firecom™, model uhw-505, wireless under the helmet, radio transmit headset(s) provided. A heavy duty, coiled 12 volt charging pigtail with plug will be provided driver's seat, officer seat, driver's side outboard forward-facing seat and passenger's side outboard forward-facing seat.
- 4.203.1** Each headset will feature:
- 4.203.2** Noise cancelling electric microphone.
- 4.203.3** Flexible microphone boom
- 4.203.4** Ear seals with 20 dB noise reduction
- 4.203.5** Stereo Listen-Through Ear dome microphones
- 4.203.6** Radio Push To Transmit button (Left or Right Side)
- 4.203.7** Rechargeable battery operates for 24 hours on a full charge.
- 4.203.8** IP-66 when worn.
- 4.204 HEADSET HANGERS** - There will be five (5) headset hanger(s) installed driver's seat, officer's seat, driver's side outboard forward-facing seat, passenger's side outboard forward-facing seat and rear, center, forward facing seat. The hanger(s) will meet NFPA 1901, section 14.1.11, requirement for equipment mounting.
- 4.205 MOBILE 2-WAY RADIO** - There will be one (1) Harris, model unity xg-100m mid power mobile radio provided by vendor to match 30782 .
- 4.206 CRADLE POINT MULTI-BAND ROUTER** - a cradle point multiband router for AT&T, model ibr1100lpe-at will be provided by vendor and mounted in radio box. A multi-band N-MIMO Cell and GPS antenna, white will be included.
- 4.207 MDT SYSTEM** - There will be one (1) Data 911, Model M7 mobile data terminal provided by vendor to match 30782.
- 4.208 AUXILIARY AUDIO CABLE** - An auxiliary 3.5mm stereo male to 2 RCA male audio cable will be provided from the intercom aux inlet to the AM/FM radio. Auxiliary audio will be mixed with the two-way radio and intercom traffic at exactly one half the strength of the signal in the headsets.
- 4.209 TWO WAY RADIO INSTALLATION** - There will be one (1) City supplied two-way radio sent to the apparatus manufacturer's preferred radio installer to be installed Radio in panel # 6 upper to right of the officer per the shipping document. No antenna mount or whip will be included in this option. Specific radio shipping requirements will be followed.
- 4.210 MOBILE RADIO MODEM INSTALLATION** - There will be one (1) City supplied modem sent to the apparatus manufacturer's preferred installer to be installed PS rear facing radio compartment. Specific shipping requirements will be followed.
- 4.211 GPS / MULTIMODE ANTENNA INSTALLATION** - there will be one (1) City supplied GPS/ multimode antenna(s) with stud mount for thick roof material to be installed on the roof. The antenna coax cable(s) will be run per the packing list / instructions provided to the third-party installer. Specific shipping requirements will be followed. The GPS / multimode antenna will be sent to the apparatus manufacturers preferred installer prior to cab fabrication.

- 4.212 COMPLETE MDT INSTALLATION** - There will be one (1) customer supplied Mobile Data Terminal (MDT), Docking station, mounting bracket, power supply, antenna, GPS, modem, and all cabling sent to the apparatus manufacturer's preferred installer to be installed on the officer's side of engine tunnel metal plate. Specific shipping requirements will be followed.
- 4.213 PORTABLE RADIO CHARGER INSTALLATION** - There will be four (4) City supplied portable two-way radio chargers(s) sent to the apparatus manufacturer's preferred radio installer to be installed two near the driver one located facing the driver and one facing the officer/ one on each side of the cab outside EMS compartments. Specific shipping requirements will be followed.
- 4.214 RADIO ANTENNA MOUNT** - there will be one (1) standard 1.125", 18 thread antenna-mounting base(s) installed on the driver side routed to the radio box behind the officer. Make sure at least 2' of cable is able to get outside the box. On the cab roof with high efficiency, low loss, coaxial cable(s) routed to the radio box. A weatherproof cap will be installed on the mount.
- 4.215 SPECIAL WIFI ANTENNA MOUNT LOCATION** - The Command Zone advanced electronics Wi-Fi-GPS antenna will be relocated from its standard right crew cab roof location forward on the cab roof on the right side. When relocating this antenna, it must be located a minimum of nine (9) inches away from any other metallic object.
- 4.216 VEHICLE CAMERA SYSTEM** - there will be a color vehicle camera system provided with the following:
- 4.216.1** One (1) camera located at the rear of the apparatus, pointing rearward, displayed automatically with the vehicle in reverse.
 - 4.216.2** The camera images will be displayed on the driver's vehicle information center display. Audio from the microphone on the active camera will be not provided.
 - 4.216.3** The following components will be included:
 - 4.216.4** One (1) SV-CW134639CAI, camera
 - 4.216.5** One (1) amplified speaker (if applicable)
 - 4.216.6** All necessary cables included
- 4.217 RECESS REAR CAMERA** - A rear camera recess will be provided to the passenger side rear.
- 4.218 ELECTRICAL POWER CONTROL SYSTEM**
- 4.218.1** the primary power distribution will be located forward of the officer's seating position and be easily accessible while standing on the ground for simplified maintenance and troubleshooting. Additional electrical distribution centers will be provided throughout the vehicle to house the vehicle's electrical power, circuit protection, and control components. The electrical distribution centers will be located strategically throughout the vehicle to minimize wire length. For ease of maintenance, all electrical distribution centers will be easily accessible. All distribution centers containing fuses, circuit breakers and/or relays will be easily accessible.
 - 4.218.2** Distribution centers located throughout the vehicle will contain battery powered studs for supplying customer installed equipment thus providing a lower cost of ownership.
 - 4.218.3** Circuit protection devices, which conform to SAE standards, will be utilized to protect electrical circuits. All circuit protection devices will be rated per NFPA requirements to prevent wire and component damage when subjected to extreme current overload. General protection circuit breakers will be Type-I automatic reset (continuously resetting). When required, automotive type fuses will be utilized to protect electronic equipment. Control relays and solenoid will have a direct current rating of 125 percent of the maximum current for which the circuit is protected per NFPA.
- 4.219 SOLID-STATE CONTROL SYSTEM** - A solid-state electronics-based control system will be utilized to achieve advanced operation and control of the vehicle components. A fully computerized vehicle network will consist of electronic modules located near their point of use to reduce harness lengths and improve reliability. The control system will comply with SAE J1939-11 recommended practices.
- 4.219.1** The control system will operate as a master-slave system whereas the main control module instructs all other system components. The system will contain patented Mission Critical software that maintains critical

vehicle operations in the unlikely event of a main controller error. The system will utilize a Real Time Operating System (RTOS) fully compliant with OSEK/VDX™ specifications providing a lower cost of ownership.

4.219.2 For increased reliability and simplified use the control system modules will include the following attributes:

- 4.219.2.1** Green LED indicator light for module power
- 4.219.2.2** Red LED indicator light for network communication stability status
- 4.219.2.3** Control system self-test at activation and continually throughout vehicle operation
- 4.219.2.4** No moving parts due to transistor logic
- 4.219.2.5** Software logic control for NFPA mandated safety interlocks and indicators.
- 4.219.2.6** Integrated electrical system load management without additional components.
- 4.219.2.7** Integrated electrical load sequencing system without additional components.
- 4.219.2.8** Customized control software to the vehicle's configuration
- 4.219.2.9** Factory and field re programmable to accommodate changes to the vehicle's operating parameters.
- 4.219.2.10** Complete operating and troubleshooting manuals
- 4.219.2.11** USB connection to the main control module for advanced troubleshooting
- 4.219.2.12** To assure long life and operation in a broad range of environmental conditions, the solid-state control system modules will meet the following specifications:
 - 4.219.2.13** Module circuit board will meet SAE J771 specifications
 - 4.219.2.14** Operating temperature from -40C to +70C
 - 4.219.2.15** Storage temperature from -40C to +70C
 - 4.219.2.16** Vibration to 50g
 - 4.219.2.17** IP67 rated enclosure (Totally protected against dust and also protected against the effect of temporary immersion between 15 centimeters and one (1) meter)
 - 4.219.2.18** Operating voltage from eight (8) volts to 16 volts DC
 - 4.219.2.19** The main controller will activate status indicators and audible alarms designed to provide warning of problems before they become critical.

4.220 CIRCUIT PROTECTION AND CONTROL DIAGRAM - Copies of all job-specific, computer network input and output (I/O) connections will be provided with each chassis. The sheets will indicate the function of each module connection point, circuit protection information (where applicable), wire numbers, wire colors and load management information.

4.221 ON-BOARD ELECTRICAL SYSTEM DIAGNOSTICS - Advanced on-board diagnostic messages will be provided to support rapid troubleshooting of the electrical power and control system. The diagnostic messages will be displayed on the information center located at the driver's position. The on-board information center will include the following diagnostic information:

- 4.221.1** Text description of active warning or caution alarms
- 4.221.2** Simplified warning indicators
- 4.221.3** Amber caution indication with intermittent alarm
- 4.221.4** Red warning indication with steady tone alarm

4.222 TECH MODULE WITH WIFI - An in-cab module will provide Wi-Fi wireless interface and data logging capability. The Wi-Fi interface will comply with IEEE 802.11 b/g/n capabilities while communicating at 2.4 Gigahertz. The module will provide an external antenna connection allowing a line of site communication range of up to 300 feet with a roof mounted antenna.

- 4.222.1** The module will transmit a password protected web page to a Wi-Fi enabled device (i.e., most smart phones, tablets or laptops) allowing two levels of user interaction. The firefighter level will allow vehicle monitoring of the vehicle and firefighting systems on the apparatus. The technician level will allow diagnostic access to inputs and outputs installed on the Command Zone™, control and information system.
- 4.222.2** The data logging capability will record faults from the engine, transmission, ABS and Command Zone, control and information systems as they occur. No other data will be recorded at the time the fault occurs. The data logger will provide up to 2 Gigabytes of data storage.

- 4.222.3** A USB connection will be provided on the Tech Module. It will provide a means to download data logger information and update software in the device.
- 4.223 PROGNOSTICS** - A software-based vehicle tool will be provided to predict remaining life of the vehicle's critical fluid and events. The system will send automatic indications to the Command Zone, color display and/or wireless enabled device to proactively alert of upcoming service intervals.
- 4.223.1** Prognostics will include:
- 4.223.2** Engine oil and filter
- 4.223.3** Transmission oil and filter
- 4.223.4** Pump oil (if equipped)
- 4.223.5** Foam oil (if equipped)
- 4.223.6** Aerial oil and filter (if equipped)
- 4.224 ADVANCED DIAGNOSTICS** - An advanced, Windows-based, diagnostic software program will be provided for this control system. The software will provide troubleshooting tools to service technicians equipped with a Windows-based computer or wireless enabled device. The service and maintenance software will be easy to understand and use and have the ability to view system input/output (I/O) information.
- 4.225 INDICATOR LIGHT AND ALARM PROVE-OUT SYSTEM** - A system will be provided which automatically tests basic indicator lights and alarms located on the cab instrument panel.
- 4.226 VOLTAGE MONITOR SYSTEM** - A voltage monitoring system will be provided to indicate the status of the battery system connected to the vehicle's electrical load. The system will provide visual and audible warning when the system voltage is below or above optimum levels. The alarm will activate if the system falls below 11.8 volts DC for more than two (2) minutes.
- 4.227 DEDICATED RADIO EQUIPMENT CONNECTION POINTS**- There will be three (3) studs provided in the primary power distribution center located in front of the officer for two-way radio equipment. The studs will consist of the following:
- 4.227.1** 12-volt 40-amp battery switched power
- 4.227.2** 12-volt 60-amp ignition switched power
- 4.227.3** 12-volt 60-amp direct battery power
- 4.227.4** There will also be a 12-volt 100-amp ground stud located in or adjacent to the power distribution center.
- 4.228 ENHANCED SOFTWARE** - The solid-state control system will include the following software enhancements:
- 4.228.1** All perimeter lights and scene lights (where applicable) will be deactivated when the parking brake is released.
- 4.228.2** Cab and crew cab dome lights will remain on for ten (10) seconds for improved visibility after the doors close. The dome lights will dim after ten (10) seconds or immediately if the vehicle is put into gear.
- 4.228.3** Cab and crew cab perimeter lights will remain on for ten (10) seconds for improved visibility after the doors close. The dome lights will dim after ten (10) seconds or immediately if the vehicle is put into gear.
- 4.229 EMI/RFI PROTECTION** - To prevent erroneous signals from crosstalk contamination and interference, the electrical system will meet, at a minimum, SAE J551/2, thus reducing undesired electromagnetic and radio frequency emissions. An advanced electrical system will be used to ensure radiated and conducted electromagnetic interference (EMI) or radio frequency interference (RFI) emissions are suppressed at their source.
- 4.229.1** The apparatus will have the ability to operate in the electromagnetic environment typically found in fire ground operations to ensure clean operations. The electrical system will meet, without exceptions, electromagnetic susceptibility conforming to SAE J1113/25 Region 1, Class C EMR for 10Khz-1GHz to 100 Volts/Meter. The vehicle OEM, upon request, will provide EMC testing reports from testing conducted on an entire apparatus and will certify that the vehicle meets SAE J551/2 and SAE J1113/25 Region 1, Class C EMR for 10Khz-1GHz to 100 Volts/Meter requirements.

4.229.2 EMI/RFI susceptibility will be controlled by applying appropriate circuit designs and shielding. The electrical system will be designed for full compatibility with low-level control signals and high-powered two-way radio communication systems. Harness and cable routing will be given careful attention to minimize the potential for conducting and radiated EMI/RFI susceptibility.

4.230 ELECTRICAL - All 12-volt electrical equipment installed by the apparatus manufacturer will conform to modern automotive practices. All wiring will be high temperature crosslink type. Wiring will be run, in loom or conduit, where exposed and have grommets where wire passes through sheet metal. Automatic reset circuit breakers will be provided which conform to SAE Standards. Wiring will be color, function and number coded. Function and number codes will be continuously imprinted on all wiring harness conductors at 2.00" intervals. Exterior exposed wire connectors will be positive locking, and environmentally sealed to withstand elements such as temperature extremes, moisture and automotive fluids.

4.230.1 Electrical wiring and equipment will be installed utilizing the following guidelines:

4.230.2 All holes made in the roof will be caulked with silicon. Large fender washers, liberally caulked, will be used when fastening equipment to the underside of the cab roof.

4.230.3 Any electrical component that is installed in an exposed area will be mounted in a manner that will not allow moisture to accumulate in it. Exposed area will be defined as any location outside of the cab or body.

4.230.4 Electrical components designed to be removed for maintenance will not be fastened with nuts and bolts. Metal screws will be used in mounting these devices. Also, a coil of wire will be provided behind the appliance to allow them to be pulled away from mounting area for inspection and service work.

4.230.5 Corrosion preventative compound will be applied to all terminal plugs located outside of the cab or body. All non-waterproof connections will require this compound in the plug to prevent corrosion and for easy separation (of the plug).

4.230.6 All lights that have their sockets in a weather exposed area will have corrosion preventative compound added to the socket terminal area.

4.230.7 All electrical terminals in exposed areas will have silicon (1890) applied completely over the metal portion of the terminal.

4.230.8 All lights and reflectors, required to comply with Federal Motor Vehicle Safety Standard #108, will be furnished. Rear identification lights will be recessed mounted for protection. Lights and wiring mounted in the rear bulkheads will be protected from damage by installing a false bulkhead inside the rear compartments.

4.230.9 An operational test will be conducted to ensure that any equipment that is permanently attached to the electrical system is properly connected and in working order.

4.230.10 The results of the tests will be recorded and provided to the City at time of delivery.

4.231 BATTERY SYSTEM - There will be six (6) 12-volt Exide®, Model 31S950X3W, batteries that include the following features will be provided:

4.231.1 950 CCA, cold cranking amps

4.231.2 190-amp reserve capacity

4.231.3 High cycle

4.231.4 Group 31

4.231.5 Rating of 5700 CCA at 0 degrees Fahrenheit

4.231.6 1140 minutes of reserve capacity

4.231.7 Threaded stainless steel studs.

4.231.8 Each battery case will be a black polypropylene material with a vertically ribbed container for increased vibration resistance. The cover will be manifold vented with a central venting location to allow a 45-degree tilt capacity.

4.231.9 The inside of each battery will consist of a "maintenance free" grid construction with poly wrapped separators and a flooded epoxy bottom anchoring for maximum vibration resistance.

4.232 BATTERY SYSTEM - A single starting system will be provided. An ignition switch and starter button will be located on the instrument panel.

- 4.233 MASTER BATTERY SWITCH** - There will be a Cole Hersee, Model 75908, master battery switch to activate the battery system, provided inside the cab within easy reach of the driver. An indicator light will be provided on the instrument panel to notify the driver of the status of the battery system.
- 4.234 BATTERY COMPARTMENTS** - The batteries will be stored in well-ventilated compartments that are located under the cab and bolted directly to the chassis frame. The battery compartments will be constructed of 3/16" steel plate and be designed to accommodate a maximum of three (3) group 31 batteries in each compartment. The compartments will include formed fit heavy-duty roto-molded polyethylene battery tray inserts with drains on each side of the frame rails. The batteries will be mounted inside of the roto-molded trays.
- 4.235 JUMPER STUDS** - One (1) set of battery jumper studs with plastic color-coded covers will be installed on the battery box on the driver's side. This will allow enough room for easy jumper cable access.
- 4.236 BATTERY CHARGER** - There will be a Kussmaul™ 1200, Model 091-187-12-Remote, 40-amp battery charger provided with Model 091-199-001 remote bar graph display. The Model 091-199-001 display will be shipped to City with the loose equipment. There will be a Kussmaul Model 091-198-12-PP remote display installed on the apparatus red. The display will be connected to the 12-volt DC electrical system and the air pressure will be connected to the apparatus air brake system. The battery charger will be wired to the AC shoreline inlet. Battery charger/compressor will be located rear facing seat risers, compressor on the DS and the charger on the PS. Make sure the pump is down low with the pump discharge mounted down as indicated on the installation instructions. The charger needs to have the 120-volt receptacle, not hard wired. The battery charger indicator will be located behind the driver's door on the outside of the cab.
- 4.237 SHORELINE INLET**
- 4.237.1** There will be one (1) Blue Sea Sure Eject™ part number 7851, 20-amp 120-volt AC shoreline inlet provided to operate the dedicated 120-volt AC circuits on the apparatus.
- 4.237.2** The shoreline will be connected to battery charger and air compressor.
- 4.237.3** The shoreline inlet cover color must be red.
- 4.237.4** The connector body will be released from the inlet when the apparatus engine start button is activated.
- 4.237.5** There will be a mating connector body supplied with the loose equipment.
- 4.237.6** There will be a label installed near the inlet(s) that state the following:
- 4.237.7** Line Voltage
- 4.237.8** Current Rating (amps)
- 4.237.9** Phase
- 4.237.10** Frequency
- 4.237.11** The shoreline receptacle will be located on the driver side of cab, above wheel.
- 4.238 ALTERNATOR** - A Delco Remy®, Model 55SI, alternator will be provided. It will have a rated output current of 430 amps, as measured by SAE method J56. The alternator will feature an integral regulator and rectifier system that has been tested and qualified to an ambient temperature of 257 degrees Fahrenheit (125 degrees Celsius). The alternator will be connected to the power and ground distribution system with heavy-duty cables sized to carry the full rated alternator output.
- 4.239 GUARD** - There will be an aluminum cover installed around the relays/solenoids and fuses located in the frame rail to help deflect water and steam.
- 4.240 SPECIAL LOCATED JUCTION BOX** - The junction box normally located behind the DS front cab doorstep for the shoreline will be relocated to inside the cab.
- 4.241 SPECIAL LOCATION POWER & GROUND STUDS**
- 4.241.1** The chassis ground stud located in the left side of the chassis frame just ahead of the battery box will be lengthened to allow the ground connections to be spaced out of the frame to prevent the connections from being covered by other components.
- 4.241.2** The front mid power and ground studs will be relocated to a rigid painted bracket below the front mid cross member to allow access from under the truck. A dedicated ground cable will connect this ground stud to the front left side ground stud.

- 4.241.3 The rear mid power and ground studs (if applicable) will be relocated to a rigid painted bracket below the rear mid cross member to allow access from under the truck. A dedicated ground cable will connect this ground stud to the front mid ground stud.
- 4.241.4 The rear power and ground studs will be mounted to the rear fuel tank bracket in a way that allows access from under the truck. A dedicated ground cable will connect this ground stud to the rear mid ground stud.
- 4.241.5 **HATCH COMPARTMENT HARNESS ROUTING** - The wiring required for the hatch will come up at the front of the hatch from the body therefore avoiding any wiring down the length of the hatch compartment.

4.242 ELECTRONIC LOAD MANAGER

- 4.242.1 An electronic load management (ELM) system will be provided that monitors the vehicles 12-volt electrical system, automatically reducing the electrical load in the event of a low voltage condition, and automatically restoring the shed electrical loads when a low voltage condition expires. This ensures the integrity of the electrical system.
- 4.242.2 For improved reliability and ease of use, the load manager system will be an integral part of the vehicle's solid state control system requiring no additional components to perform load management tasks. Load management systems which require additional components will not be allowed.
- 4.242.3 The system will include the following features:
- 4.242.4 System voltage monitoring.
- 4.242.5 A shed load will remain inactive for a minimum of five minutes to prevent the load from cycling on and off.
- 4.242.6 Sixteen available electronic load shedding levels.
- 4.242.7 Priority levels can be set for individual outputs.
- 4.242.8 High Idle to activate before any electric loads are shed and deactivate with the service brake.
- 4.242.9 If enabled:
- 4.242.10 "Load Man Hi-Idle On" will display on the information center.
- 4.242.11 Hi-Idle will not activate until 30 seconds after engine start up.
- 4.242.12 Individual switch "on" indicator to flash when the particular load has been shed.
- 4.242.13 The information center indicates system voltage.
- 4.242.14 The information center, where applicable, includes a "Load Manager" screen indicating the following:
- 4.242.15 Load managed items list, with priority levels and item condition.
- 4.242.16 Individual load managed item condition:
- 4.242.17 ON = not shed
- 4.242.18 SHED = shed

4.243 SEQUENCER - A sequencer will be provided that automatically activates and deactivates vehicle loads in a preset sequence thereby protecting the alternator from power surges. This sequencer operation will allow a gradual increase or decrease in alternator output, rather than loading or dumping the entire 12-volt load to prolong the life of the alternator.

- 4.243.1 For improved reliability and ease of use, the load sequencing system will be an integral part of the vehicle's solid state control system requiring no additional components to perform load sequencing tasks. Load sequencing systems which require additional components will not be allowed.
- 4.243.2 Emergency light sequencing will operate in conjunction with the emergency master light switch. When the emergency master switch is activated, the emergency lights will be activated one by one at half-second intervals. Sequenced emergency light switch indicators will flash while waiting for activation.
- 4.243.3 When the emergency master switch is deactivated, the sequencer will deactivate the warning light loads in the reverse order.
- 4.243.4 Sequencing of the following items will also occur, in conjunction with the ignition switch, at half-second intervals:
- 4.243.5 Cab Heater and Air Conditioning
- 4.243.6 Crew Cab Heater (if applicable)
- 4.243.7 Crew Cab Air Conditioning (if applicable)
- 4.243.8 Exhaust Fans (if applicable)
- 4.243.9 Third Evaporator (if applicable)

4.244 HEADLIGHTS

4.244.1 There will be four (4) JW Speaker Evolution, Model 8630, 5.60" round LED lights with polycarbonate lenses mounted in the front chrome trim housing on each side of the cab grille:

4.244.2 one (1) part number 054991, low and high beam installed in the outside position on the driver's side.

4.244.3 one (1) part number 054991, low and high beam installed in the inside position on the driver's side.

4.244.4 one (1) part number 054991, low and high beam installed in the inside position on the passenger's side.

4.244.5 one (1) part number 054991, low and high beam installed in the outside position on the passenger's side.

4.244.6 The LEDs included in the outer section of the headlights will be controlled per the following:

4.244.7 activated when the battery switch is on, the ignition switch is on, and the parking brake is released.

4.244.8 deactivated when the headlight switch is on, or the high-beam flash is on or when the parking brake is applied.

4.245 **DIRECTIONAL LIGHTS** - There will be two (2) Whelen 600® series, LED combination directional/marker lights provided. The lights will be located on the outside cab corners, next to the headlights. The color of the lenses will be clear.

4.246 **INTERMEDIATE LIGHT** - There will be two (2) Weldon, Model 9186-8580-29, amber LED turn signal marker lights furnished, one (1) each side, in the rear fender panel. The light will double as a turn signal and marker light.

4.247 **CAB CLEARANCE/MARKER/ID LIGHTS** - There will be seven (7) Whelen, Model 0SA00MCR, amber LED lights provided to indicate the presence and overall width of the vehicle in the following locations:

4.247.1 Three (3) amber LED identification lights will be installed in the center of the cab above the windshield.

4.247.2 Two (2) amber LED clearance lights will be installed, one (1) on each outboard side of the cab above the windshield.

4.247.3 Two (2) amber LED marker lights will be installed, one (1) on each side above the cab doors.

4.248 **REAR CLEARANCE/MARKER/ID LIGHTING** - There will be three (3) Whelen®, Model 0SR00MCR, LED lights with a chrome flange used as identification lights located at the rear of the apparatus per the following:

4.248.1 As close as practical to the vertical centerline

4.248.2 Centers spaced not less than 6.00" or more than 12.00" apart.

4.248.3 Red in color

4.248.4 All at the same height

4.248.5 There will be two (2) Whelen, Model 0SR00MCR, LED lights with a chrome flange installed at the rear of the apparatus used as clearance lights located at the rear of the apparatus per the following:

4.248.5.1 To indicate the overall width of the vehicle

4.248.5.2 One (1) each side of the vertical centerline

4.248.5.3 As near the top as practical

4.248.5.4 Red in color

4.248.5.5 Must be visible from the rear

4.248.5.6 All at the same height

4.248.6 There will be two (2) Whelen, Model 0SR00MCR, LED lights with a chrome flange installed on the side of the apparatus as marker lights as close to the rear as practical per the following:

4.248.6.1 To indicate the overall length of the vehicle

4.248.6.2 One (1) each side of the vertical centerline

4.248.6.3 As near the top as practical

4.248.6.4 Red in color

4.248.6.5 Must be visible from the side

4.248.6.6 All at the same height

4.248.7 There will be two (2) red reflectors located on the rear of the truck facing to the rear. One (1) each side, as far to the outside as practical, at a minimum of 15.00", but no more than 60.00", above the ground.

4.248.8 Per FMVSS 108 and CMVSS 108 requirements.

4.248.9 REAR FMVSS LIGHTING - The rear stop/tail and directional LED lighting will consist of the following:

4.248.9.1 Two (2) Whelen®, Model M6BTT, red LED stop/taillights

4.248.9.2 Two (2) Whelen, Model M6T, amber LED arrow turn lights.

4.248.9.3 The lights will be provided with clear lenses.

4.248.9.4 The lights will be mounted in a polished combination housing.

4.248.9.5 There will be two (2) Whelen Model M6BUW, LED backup lights provided in the taillight housing.

4.249 LICENSE PLATE BRACKET - There will be one (1) license plate bracket mounted on the rear of the body. A white LED light will illuminate the license plate. A stainless-steel light shield will be provided over the light that will direct illumination downward, preventing white light to the rear.

4.250 LIGHTING BEZEL - There will be two (2) Whelen, Model M6FCV4P, four (4) place chromed ABS housings with Pierce logos provided for the rear M6 series stop/tail, directional, back up, scene lights or warning lights.

4.251 TAILLIGHT MOUNTING INFORMATION - The following lights will be installed in the following order from the top down:

4.251.1 The top lights will be brake taillights.

4.251.2 The second lights from the top will be the directional lights.

4.251.3 The third lights from the top will be back up lights.

4.251.4 The bottom light will be the warning lights.

4.252 BACK-UP ALARM - A PRECO, Model 1040, solid-state electronic audible back-up alarm that actuates when the truck is shifted into reverse will be provided. The device will sound at 60 pulses per minute and automatically adjust its volume to maintain a minimum ten (10) dBA above surrounding environmental noise levels.

4.253 SONAR SAFETY SYSTEM - The apparatus will be equipped with a MAX 1 sonar back-up warning system. The system will automatically activate when the vehicle is placed in reverse. Four (4) Electronic sensors will be installed on the vehicles rear bumper and will emit ultrasonic pulses and listen for the returning sonic echo that bounces off an obstacle within the system's operating range. This information will be transmitted by wire to a speaker behind driver seat which warns the operator with a beeping sound indicating that there are potential obstacles at the rear of the vehicle and then a clear voice tells the operator the countdown of the remaining distance in feet as the vehicle reverses.

4.254 MARKER LIGHTS - There will be one (1) pair of amber and red Britax, Model L427.203.L12, LED marker lights with rubber arm, located on the side rear corner body each side in standard location, seal the hole in the arm so it does not collect water. The amber lens will face the front and the red lens will face the rear of the truck and be the most rearward marker light. These lights will be activated with the running lights of the vehicle and when the respective directional lights are activated.

4.255 DEUTSCH CONNECTIONS - All external 12V electrical light connections will be installed with Deutsch connectors.

4.256 CAB PERIMETER SCENE LIGHTS - There will be four (4) Amdor, Model AY-LB-12HW012, 190 lumens each, 12.00" white LED strip lights provided.

4.256.1 One (1) under the driver's side cab access step.

4.256.2 One (1) under the passenger's side cab access step.

4.256.3 One (1) under the passenger's side crew cab access step.

4.256.4 One (1) under the driver's side crew cab access step.

4.256.5 The lights will be activated when the battery switch is on and the respective door is open and whenever control has been selected for the body perimeter lights.

- 4.257 PUMP HOUSE PERIMETER LIGHTS** - There will be four (4) Amdor, Model AY-LB-12HW0**, white LED light strips provided. The lights will be mounted in the following locations:
- 4.257.1** One (1) Model AY-LB-12HW012, 190 lumens each, 12.00" LED light will be provided under the driver's side top mount pump panel access step.
 - 4.257.2** One (1) Model AY-LB-12HW020, 350 lumens each, 20.00" LED light will be provided under the driver's side pump panel running board.
 - 4.257.3** One (1) Model AY-LB-12HW020, 350 lumens each, 20.00" LED light will be provided under the passenger's side pump panel running board.
 - 4.257.4** One (1) Model AY-LB-12HW012, 190 lumens each, 12.00" LED light will be provided under the passenger's side top mount pump panel access step.
 - 4.257.5** The light will be activated when the battery switch is on, and controlled by the same means as the body perimeter lights.
- 4.258 BODY PERIMETER SCENE LIGHTS** - There will be two (2) Amdor, Model AY-LB-12HW012, 190 lumens each, 12.00" 12-volt DC LED strip lights provided at the rear step area of the body, one (1) each side shining to the rear. The perimeter scene lights will be activated when the parking brake is applied, either directional light is activated, activating all side facing perimeter lights and the reverse signal activated, activating all the side facing perimeter lights.
- 4.259 ADDITIONAL PERIMETER LIGHTS** - There will be six (6) lights Amdor®, Model AY-LB-12HW012, 190 lumens each, 12.00" white LED perimeter light(s) provided one (1) light under compartment D1, one (1) light under compartment D3, one (1) light under compartment P1, one (1) light under compartment P3 and one (1) light under each side of the front bumper spaced evenly. These lights will be activated the same as the body perimeter lights.
- 4.260 STEP LIGHTS** - There will be four (4) white LED, step lights provided. One (1) step light will be provided on each side, on the front compartment face and two (2) step lights at the rear to illuminate the tailboard. In order to ensure exceptional illumination, each light will provide a minimum of 25 foot-candles (fc) covering an entire 15" x 15" square placed ten (10) inches below the light and a minimum of 1.5 fc covering an entire 30" x 30" square at the same ten (10) inch distance below the light. These step lights will be actuated when the ignition switch is on and the parking brake is set. All other steps on the apparatus will be illuminated per the current edition of NFPA 1901.
- 4.261 ADDITIONAL STEP LIGHT** - Additional lighting will be provided by white LED step lights. The step lights will be installed DS rear aux compartment, at the very top. The quantity of additional step lights will be one (1) light. In order to ensure exceptional illumination, each light will provide a minimum of 25 foot-candles (fc) covering an entire 15" x 15" square placed ten (10) inches below the light and a minimum of 1.5 fc covering an entire 30" x 30" square at the same ten (10) inch distance below the light. The additional step lights will be activated by the same means as the standard step lights.
- 4.262 CUP SWITCH** - All plastic cup switches will be replaced with S/S cup switches.
- 4.263 SCENE LIGHTS** -There will be one (1) Fire Research, Model SPA900-Q70 scene light(s) with chrome flange(s) installed on the side of the apparatus, Drivers side upper section between the doors. A control for the light(s) selected above will be the following:
- 4.263.1** a switch at the driver's side switch panel
 - 4.263.2** opening the driver's side cab or crew cab doors
 - 4.263.3** a switch at the passenger's side switch panel
 - 4.263.4** no additional switch location
 - 4.263.5** These lights may be load managed when the parking brake is set.
- 4.264 SCENE LIGHTS** - There will be one (1) Fire Research, Model SPA900-Q70 scene light(s) with chrome flange(s) installed on the side of the apparatus, Passenger side upper section between the doors. A control for the light(s) selected above will be the following:
- 4.264.1** a switch at the driver's side switch panel
 - 4.264.2** opening the passenger's side cab or crew cab doors
 - 4.264.3** a switch at the passenger's side switch panel

4.264.4 no additional switch location

4.265 These lights may be load managed when the parking brake is set.

4.266 **12 VOLT LIGHTING** - There will be one (1) Fire Research Spectra, Model SPA530-Q20*, 12-volt DC LED scene light(s) provided on push upside mount pole(s), located just behind the speed lays and just below the top of the pump panel side step, Passenger Side, to match 29674 and 30782. Install Deutch connector for DNMT on back of panel 2 feet from pump panel so it can be disconnected from the PS access door.

4.266.1 The painted parts of this light assembly must be white with a white bezel.

4.266.2 The light(s) will be controlled in the following way:

4.266.3 a switch at the driver's side switch panel

4.266.4 a switch at the pump operator's panel

4.266.5 a switch at the passenger's side switch panel

4.266.6 a cup switch just to the front of the locking ring on the light pole, on the 4-way

4.266.7 These light(s) may be load managed when the parking brake is applied.

4.266.8 These lights will be connected to the Do Not Move Truck Indicator circuit.

4.267 **12 VOLT LIGHTING** - There will be one (1) Fire Research Spectra, Model SPA530-Q20*, 12-volt DC LED scene light(s) provided on push upside mount pole(s), located Just behind the speed lays and just below the top of the pump panel side step, Driver side, to match 29674 and 30782.

4.267.1 The painted parts of this light assembly must be white with a white bezel.

4.267.2 The light(s) will be controlled in the following way:

4.267.3 a switch at the driver's side switch panel

4.267.4 a switch at the pump operator's panel

4.267.5 a switch at the passenger's side switch panel

4.267.6 a cup switch just to the front of the locking ring on the light pole, on the 4-way

4.267.7 These light(s) may be load managed when the parking brake is applied.

4.267.8 These lights will be connected to the Do Not Move Truck Indicator circuit.

4.268 **12 VOLT LIGHTING** - There will be one (1) Fire Research, Model SPA851-Q20-*, 12-volt LED floodlight(s) provided on the front visor, centered.

4.268.1 The housing(s) painted parts of this light assembly must be white with a white bezel.

4.268.2 The light(s) will be controlled in the following way:

4.268.3 a switch at the driver's side switch panel

4.268.4 a switch at the pump operator's panel

4.268.5 a switch at the passenger's side switch panel

4.268.6 no additional switch location

4.268.7 These lights may be load managed when the parking brake is applied.

4.269 **REAR SCENE LIGHT(S)** - There will be two (2) Fire Research, Model SPA900-Q70, LED scene light(s) with chrome trim bezels installed at the rear of the apparatus, on the rear bulkhead of the hatch compartment.

4.269.1 The light(s) will be controlled by a switch at the driver's side switch panel, by a switch at the top mount pump panel and by a cup switch at the driver's side rear bulkhead.

4.269.2 The light(s) may be load managed when the parking brake is set.

4.270 **WALKING SURFACE LIGHT** - There will be Model FRP, 4" round black 12-volt DC LED floodlight with bolt mount provided to illuminate the entire designated walking surface on top of the body. The light(s) will be activated by the same switching that has been selected for the other rear scene light(s) on the apparatus.

4.271 WATER TANK - Booster tank will have a capacity of 750 gallons and be constructed of polypropylene plastic by United Plastic Fabricating, Incorporated. Tank joints and seams will be nitrogen welded inside and out. -Tank will be baffled in accordance with NFPA Bulletin 1901 requirements. Baffles will have vent openings at both the top and bottom to permit movement of air and water between compartments.

4.271.1 Longitudinal partitions will be constructed of .38" polypropylene plastic and will extend from the bottom of the tank through the top cover to allow for positive welding.

4.271.2 Transverse partitions will extend from 4.00" off the bottom of the tank to the underside of the top cover.

4.271.3 All partitions will interlock and will be welded to the tank bottom and sides.

4.271.4 Tank top will be constructed of .50" polypropylene. It will be recessed .38" and will be welded to the tank sides and the longitudinal partitions.

4.271.5 Tank top will be sufficiently supported to keep it rigid during fast filling conditions.

4.271.6 Construction will include 2.00" polypropylene dowels spaced no more than 30.00" apart and welded to the transverse partitions. Two (2) of the dowels will be drilled and tapped (.50" diameter, 13.00" deep) to accommodate lifting eyes.

4.271.7 A sump that will be sized dependent on the tank to pump plumbing will be provided at the bottom of the water tank.

4.271.8 Sump will include a drain plug and the tank outlet.

4.271.9 Tank will be installed in a fabricated cradle assembly constructed of structural steel.

4.271.10 Sufficient crossmembers will be provided to properly support bottom of tank. Crossmembers will be constructed of steel bar channel or rectangular tubing.

4.271.11 Tank will "float" in cradle to avoid torsional stress caused by chassis frame flexing. Rubber cushions, .50" thick x 3.00" wide, will be placed on all horizontal surfaces that the tank rests on.

4.271.12 Stops or other provision will be provided to prevent an empty tank from bouncing excessively while moving vehicle.

4.271.13 Mounting system will be approved by the tank manufacturer.

4.271.14 Fill tower will be constructed of .50" polypropylene and will be a minimum of 8.00" wide x 14.00" long.

4.271.15 Fill tower will be furnished with a .25" thick polypropylene screen and a hinged cover.

4.271.16 An overflow pipe, constructed of 4.00" schedule 40 polypropylene, will be installed approximately halfway down the fill tower and extend through the water tank and exit to the rear of the rear axle.

4.272 MANHOLE COVER - A removable manhole cover will be provided on the foam tank for internal access.

4.273 POLY TANK NOTCH - A notch will be provided at the front of the poly water tank. The notch will be large enough for hose, hydraulic lines, or electrical wiring at the front of the hose bed.

4.274 SLEEVE, PLUMBING, THROUGH TANK - One (1) sleeve will be provided in the water tank for a 3.00" pipe to the rear.

4.275 HOSE BED - The hose bed will be fabricated of .125"-5052 aluminum with a nominal 38,000 psi tensile strength. Upper and rear edges of side panels will have a double break for rigidity. The upper inside area of the beavertails will be covered with brushed stainless steel to prevent damage to painted surface when hose is removed. Flooring of the hose bed will be removable aluminum grating with the top surface corrugated to aid in hose aeration. The grating slats will be a minimum of 0.50" x 4.50" with spacing between slats for hose ventilation. Hose bed will accommodate 200' of 3" (should be about 7 inches spacing), 1000' of 5" (should be about 41.25 inches spacing), 200' of 1.75" (should be about 8 inches spacing), 400' of 1.75" (should be about 11 inches spacing).

4.276 HOSE BED DIVIDER - Three (3) adjustable hosebed dividers will be furnished for separating hose. Each divider will be constructed of a .25" brushed aluminum sheet. Flat surfaces will be sanded for uniform appearance or constructed of brushed aluminum. An oval opening will be provided near the rear of the divider to be used as a hand hold and aid in accessing the hose bed. Divider will be fully adjustable by sliding in tracks, located at the front and rear of the hose bed. Divider will be held in place by tightening bolts, at each end. Acorn nuts will be installed on all bolts in the hose bed which have exposed threads.

- 4.277 HOSE RESTRAINT** - The hose in the hosebed will be restrained by black nylon velcro straps at the top of the hosebed and a black nylon web strap netting at the top and rear of the hosebed. The netting will include quick release fasteners. The center of the black nylon velcro strap at the front of the hosebed will be located 32.0" rearward of the cross divider. The center of the buckle bracket mounted on the top of the side sheet flange for the black nylon web strap netting will be mounted 36.0" from the rear most edge of the side sheet (beavertail).
- 4.278 SCUFFPLATE INSIDE UPPER BEAVERTAIL** - The upper inside area of the beavertails will be covered with polished stainless steel in place of the brushed stainless steel to prevent damage to painted surface when hose is removed.
- 4.279 RUNNING BOARDS** - Running boards will be fabricated of .125" bright aluminum treadplate. Each running board will be supported by a welded 2.00" square tubing and channel assembly, which will be bolted to the pump compartment substructure. Running boards will be 12.75" deep and spaced .50" away from the pump panel. A splash guard will be provided above the running board treadplate.
- 4.280 TAILBOARD** - The tailboard will also be constructed of .125" bright aluminum treadplate and spaced .50" from the body, as well as supported by a structural steel assembly. The tailboard area will be 24.00" deep in the center area and 8.00" deep to the rear of the side compartments. The tailboard will be T-shaped. The outboard sides of the tailboard will be angled at 45 degrees beginning at the point where the body meets the tailboard at the outboard edge angling rearward to the rear edge of the tailboard. The exterior side will be flanged down and in for increased rigidity of tailboard structure.
- 4.281 REAR WALL, SMOOTH ALUMINUM/BODY MATERIAL** - The rear facing surfaces of the center rear wall will be smooth aluminum. The bulkheads, the surface to the rear of the side body compartments, will be smooth and the same material as the body. Any inboard facing surfaces below the height of the hosebed will be aluminum diamondplate.
- 4.282 TOW BAR** - A tow bar will be installed under the tailboard at center of truck. Tow bar will be fabricated of 1.00" CRS bar rolled into a 3.00" radius. Tow bar assembly will be constructed of .38" structural angle. When force is applied to the bar, it will be transmitted to the frame rail. Tow bar assembly will be designed and positioned to allow up to a 30-degree upward angled pull of 17,000 lb, or a 20,000 lb straight horizontal pull in line with the centerline of the vehicle. Tow bar design will have been fully tested and evaluated using strain gauge testing and finite element analysis techniques.
- 4.283 RUNNING BOARD HOSE RESTRAINT** - A pair of 2.00" wide black nylon straps with Velcro fasteners will be provided for each hose tray to secure the hose during travel. There will be Two (2) hose trays located one (1) in each side running board.
- 4.284 HOSE TRAY** - Two (2) hose trays will be recessed one (1) in each side running board. The size of the tray will be 59.5" long, 9" wide, and 10" deep. Rubber matting will be installed on the floor of the tray to provide proper ventilation.
- 4.285 COMPARTMENTATION** - Body and compartments will be fabricated of .125", 5052-H32 aluminum. Side compartments will be an integral assembly with the rear fenders. Circular fender liners will be provided for prevention of rust pockets and ease of maintenance. Side compartment flooring will be of the sweep out design with the floor higher than the compartment door lip. The side compartment door opening will be framed by flanging the edges in 1.75" and bending out again .75" to form an angle. Drip protection will be provided above the doors by means of bright aluminum extrusion, formed bright aluminum treadplate or polished stainless steel. The top of the compartment will be covered with bright aluminum treadplate rolled over the edges on the front, rear and outward side. These covers will have the corners welded. Side compartment covers will be separate from the compartment tops. Front facing compartment walls will be covered with bright aluminum treadplate. All screws and bolts which protrude into a compartment will have acorn nuts on the ends to prevent injury.
- 4.286 UNDERBODY SUPPORT SYSTEM** - Due to the severe loading requirements of this pumper a method of body and compartment support suitable for the intended load will be provided.
- 4.286.1** The backbone of the support system will be the chassis frame rails which is the strongest component of the chassis and is designed for sustaining maximum loads.
- 4.286.2** The support system will include .375" thick steel vertical angle supports bolted to the chassis frame rails with .625" diameter bolts.

- 4.286.3** Attached to the bottom of the steel vertical angles will be horizontal angles, with gussets welded to the vertical members, which extend to the outside edge of the body.
- 4.286.4** A steel frame will be mounted on the top of these supports to create a floating substructure which will result in a 500 lb. equipment support rating per lower compartment.
- 4.286.5** The floating substructure will be separated from the horizontal members with neoprene elastomer isolators. These isolators will reduce the natural flex stress of the chassis from being transmitted to the body.
- 4.286.6** Isolators will have a broad load range, proven viability in vehicular applications, be of a fail-safe design and allow for all necessary movement in three (3) transitional and rotational modes.
- 4.286.7** The neoprene isolators will be installed in a modified V three (3)-point mounting pattern to reduce the natural flex of the chassis being transmitted to the body.
- 4.287 AGGRESSIVE WALKING SURFACE** - All exterior surfaces designated as stepping, standing, and walking areas will comply with the required average slip resistance of the current NFPA standards.
- 4.288 LOUVERS** - Louvers will be stamped into compartment walls to provide the proper airflow inside the body compartments and to prevent water from dripping into the compartment. Where these louvers are provided, they will be formed into the metal and not added to the compartment as a separate plate.
- 4.289 LEFT SIDE COMPARTMENTATION** - A full height, rollup door compartment ahead of the rear wheels will be provided. The interior dimensions of this compartment will be 34.50" wide x 57.25" high x 25.88" deep in the lower 31.00" of the compartment and 12.00" deep in the remaining upper portion. The height of the compartment will be measured from the compartment floor to the bottom edge of the door roll. The depth of the compartment will be calculated with the compartment door closed. The compartment interior will be fully open from the compartment ceiling to the compartment floor and designed so that no permanent dividers are required between the upper and lower sections. The clear door opening of this compartment will be 28.75" wide x 57.25" high.
- 4.289.1** Closing of the door will not require releasing, unlocking, or unlatching any mechanism and will easily be accomplished with one hand.
- 4.289.2** A rollup door compartment over the rear wheels will be provided. The interior dimensions of this compartment will be 66.50" wide x 25.38" high x 12.00" deep. The height of the compartment will be measured from the compartment floor to the bottom edge of the door roll. The depth of the compartment will be calculated with the compartment door closed. The clear door opening of this compartment will be 58.25" wide x 25.12" high.
- 4.289.3** Closing of the door will not require releasing, unlocking, or unlatching any mechanism and will easily be accomplished with one hand.
- 4.289.4** A full height, rollup door compartment behind the rear wheels will be provided. The interior dimensions of this compartment will be 47.50" wide x 58.25" high x 25.88" deep in the lower 26.00" of height and 12.00" deep in the remaining upper section of the compartment. The height of the compartment will be measured from the compartment floor to the bottom edge of the door roll. The depth of the compartment will be calculated with the compartment door closed. The compartment interior will be fully open from the compartment ceiling to the compartment floor and designed so that no permanent dividers are required between the upper and lower sections. The clear door opening of this compartment will be 44.75" wide x 58.25" high.
- 4.289.5** Closing of the door will not require releasing, unlocking, or unlatching any mechanism and will easily be accomplished with one hand.
- 4.290 RIGHT SIDE COMPARTMENTATION** - The right-side compartmentation will consist of three rollup door compartments. A full height, rollup door compartment ahead of the rear wheels will be provided. The interior dimensions of this compartment will be 34.50" wide x 66.63" high x 25.88" deep in the lower 25.00" of the compartment and 12.00" deep in the remaining upper portion. The clear door opening will be a minimum of 28.75" wide x 56.88" high.
- 4.290.1** A rollup door compartment over the rear wheels will be provided. The interior dimensions of this compartment will be 66.50" wide x 32.88" high x 12.00" deep. The clear door opening will be a minimum of 58.25" wide x 23.13" high.
- 4.290.2** A full height, rollup door compartment behind the rear wheels will be provided. The interior dimensions of this compartment will be 47.75" wide x 67.63" high x 25.88" deep in the lower 26.00" of height and 12.00"

deep in the remaining upper section of the compartment. The clear door opening will be a minimum of 44.75" wide x 57.88" high.

- 4.290.3** The interior height of the compartments will be measured from the compartment floor to the ceiling. The spool of the rollup door at the top of the compartment takes up some usable space. The depth of the compartments will be measured from the back wall to the inside of the door frame.
- 4.290.4** Closing of the door will not require releasing, unlocking, or unlatching any mechanism and will easily be accomplished with one hand.
- 4.290.5 SIDE COMPARTMENT ROLLUP DOOR(S)** - There will be six (6) compartment doors installed on the side compartments, double faced, aluminum construction, painted one (1) color to match the lower portion of the body and manufactured by AMDOR™ brand rollup doors.
- 4.290.6** Door(s) will be constructed using 1.00" extruded double wall aluminum slats which will feature a flat smooth interior surface to provide maximum protection against equipment hang-up. The slats will be connected with a structural driven ball and socket hinge designed to provide maximum curtain diaphragm strength. Mounting and adjusting the curtain will be done with a clip system that connects the curtain to the balancer drum allowing for easy tension adjustment without tools. The slats will be mounted in reusable slat shoes with positive snap-lock securement.
- 4.290.7** Each slat will incorporate weather tight recessed dual durometer seals. One (1) fin will be designed to locate the seal within the extrusion. The second will serve as a wiping seal which will also allow for compression to prevent water ingress.
- 4.290.8** The doors will be mounted in a one (1)-piece aluminum side frame with recessed side seals to minimize seal damage during equipment deployment. All seals including side frames, top gutters and bottom panel shall be manufactured utilizing non-marring materials.
- 4.290.9** Bottom panel flange of rollup door will be equipped with two (2) cut-outs to allow for easier access with gloved hands.
- 4.290.10** A polished stainless steel lift bar must be provided for each roll-up door. The lift bar will be located at the bottom of door with striker latches installed at the base of the side frames. Side frame mounted door strikers will include support beneath the stainless-steel lift bar to prevent door curtain bounce, improve bottom seal life expectancy and to avoid false door ajar signals.
- 4.290.11** All injection molded rollup door wear components will be constructed of Type 6 nylon.
- 4.290.12** Each rollup door will have a 3.00-inch diameter balancer/tensioner drum to assist in lifting the door.
- 4.290.13** The header for the rollup door assembly will not exceed 4.00".
- 4.290.14** A heavy-duty magnetic switch will be used for control of open compartment door warning lights.

4.291 REAR COMPARTMENTATION - A roll-up door compartment above the rear tailboard will be provided. The interior dimensions of this compartment will be 40.00" wide x 54.13" high x 25.88" deep. The spool of the rollup door at the top of the compartment takes up some usable space. The depth of the compartment will be calculated with the compartment door closed. A louvered, removable access panel will be furnished on the back wall of the compartment. The rear compartment will be open into the rear side compartments. The clear door opening of this compartment will be a minimum of 33.25" wide x 44.38" high. Closing of the door will not require releasing, unlocking, or unlatching any mechanism and will easily be accomplished with one hand.

4.292 ROLLUP REAR COMPARTMENT DOOR - The rear compartment will have a rollup door. The door will be double faced, aluminum construction, painted one (1) color to match the lower portion of the body and manufactured by AMDOR™ brand rollup doors. The door will be constructed using 1.00" extruded double wall aluminum slats which will feature a flat smooth interior surface to provide maximum protection against equipment hang-up. The slats will be connected with a structural driven ball and socket hinge designed to provide maximum curtain diaphragm strength. Mounting and adjusting the curtain will be done with a clip system that connects the curtain to the balancer drum allowing for easy tension adjustment without tools. The slats will be mounted in reusable slat shoes with positive snap-lock securement.

- 4.292.1** Each slat will incorporate weather tight recessed dual durometer seals. One (1) fin will be designed to locate the seal within the extrusion. The second will serve as a wiping seal which will also allow for compression to prevent water ingress.
- 4.292.2** The door will be mounted in a one (1)-piece aluminum side frame with recessed side seals to minimize seal damage during equipment deployment. All seals including side frames, top gutters and bottom panel shall be manufactured utilizing non-marring materials.

- 4.292.3** Bottom panel flange of rollup door will be equipped with two (2) cut-outs to allow for easier access with gloved hands.
- 4.292.4** A polished stainless steel lift bar must be provided for each roll-up door. The lift bar will be located at the bottom of door with striker latches installed at the base of the side frames. Side frame mounted door strikers will include support beneath the stainless-steel lift bar to prevent door curtain bounce, improve bottom seal life expectancy and to avoid false door ajar signals.
- 4.292.5** All injection molded rollup door wear components will be constructed of Type 6 Nylon.
- 4.292.6** The door will have a 3.00-inch diameter balancer/tensioner drum to assist in lifting the door.
- 4.292.7** The header for the rollup door assembly will not exceed 4.00".
- 4.292.8** A heavy-duty magnetic switch will be used for control of open compartment door warning lights.
- 4.293 DOOR GUARD** - There will be seven (7) compartment doors that will include a guard/drip pan designed to protect the roll-up door from damage when in the retracted position and contain any water spray. The guard will be fabricated from stainless steel and installed All roll up doors.
- 4.294 AUXILLARY COMPARTMENT ACCESS DOOR OPEN SWITCH** - The door switch/es will be magnetic. The magnetic switch/es will be fastened with screws, not two-way tape. one (1) compartment door will have magnetic switches and mechanical fasteners will be rear compartment door on DS rear.
- 4.295 COMPARTMENT LIGHTING** - There will be seven (7) compartment(s) with two (2) LED compartment light strips. The dual light strips will be centered vertically along each side of the door framing. There will be two (2) light strips per compartment. The dual light strips will be in compartment(s): All compartments. Any remaining compartments will include a single LED compartment light strip. Opening the compartment door will automatically turn the compartment lighting on. There will be a covered metal clamp install 2.00" from each end and evenly spaced no less than 8.00" between the end clamps.
- 4.296 HATCH COMPARTMENT** - Two (2) hatch compartments will be provided above the left and right-side compartments. Each hatch compartment will extend the full length of the side body compartmentation x 13.75" wide. The height of each hatch compartment will match the side sheet height. Sides of the compartment will be constructed of the same material as the body and painted job color. A chrome and black vinyl molding will be provided to cover the seam between the top of the body panel and the bottom of the hatch compartment. The vertical outboard seam at the center of the compartment will be smooth weld finished and painted. The top of the compartment will be constructed of bright aluminum treadplate. One (1) lift-up, bright aluminum treadplate door will be provided on the top of the compartment. Door will have lipped edges with a rubber seal for weather resistance. The door will have a socket and plunger type latch and chrome grab handle. Door will be hinged on the outboard side and will utilize a gas strut. Compartment will drain to an area below the hose bed. Ribbed rubber matting will be provided on the compartment floor to stop wet equipment from sitting in water pools. Handrails will be provided at the step area to the rear of the hatch compartment. One (1) curved handrail will be mounted on the outboard side of the step area at the rear and curve over the top. One (1) straight handrail will be mounted vertically along the inboard side of the step area.
- 4.297 COMPARTMENT LIGHTING** - There will be a 42.00" 12-volt DC strip light with white LEDs mounted on the interior, hinged side of each door. The lights will be mounted with mechanical fasteners. The lights will be activated when the battery switch is on, and the door is opened.
- 4.298 MOUNTING TRACKS** - There will be six (6) sets of tracks for mounting shelf(s) in LS1, LS2, LS3, RS2, RS3 and B1. These tracks will be installed vertically to support the adjustable shelf(s) and will be full height of the compartment. The tracks will be painted to match the compartment interior.
- 4.299 ADJUSTABLE SHELVES** - There will be 13 shelves with a capacity of 500 lb provided. The shelf construction will consist of .188" aluminum painted spatter gray with 2.00" sides. Each shelf will be infinitely adjustable by means of a threaded fastener, which slides in a track. The shelves will be held in place by .12" thick stamped plated brackets and bolts. The location(s) will be in LS1 at the depth transition point, in RS3 at the transition point, in RS2 centered between the floor and the ceiling, in RS3 in the lower third, in RS3 in the upper third, in RS3 in the upper third, in LS2 centered between the floor and ceiling, in B1 centered between the floor and ceiling, in LS3 in the lower third, in LS3 in the upper third, in LS3 in the upper third, in LS1 in the upper third and in LS3 at the depth transition point.

- 4.300 SLIDE-OUT FLOOR MOUNTED TRAY** - There will be one (1) floor mounted slide-out tray(s) provided LS1. Each tray will be rated for up to 500lb in the extended position. The tray(s) will be constructed of a minimum .13" aluminum with welded corners. The finish will be painted to match compartment interior. The locking rod will be painted red 600 T. The tray(s) will be designed for maximum compartment width and depth. The side height of the tray(s) will be as follows:
- 4.300.1** Front: 2.00" high
 - 4.300.2** Rear: 4.00" high
 - 4.300.3** Left: 4.00" high
 - 4.300.4** Right: 4.00" high
 - 4.300.5** Jonathon slides will be provided that are equipped with ball bearings for ease of operation and years of dependable service. The slides will be located on the sides of the tray so that the tray can be located as close to the compartment floor as possible.
 - 4.300.6** Automatic locks will be provided for both the "in" and "out" positions. The trip mechanism for the locks will be located at the front of the tray for ease of use with a gloved hand.
- 4.301 SWING OUT TOOLBOARD** - A swing out aluminum tool board will be provided. It will be a minimum of .188" thick with .281" diameter holes in a pegboard pattern with 1.00" centers between holes. A 1.00" x 1.00" aluminum tube frame will be welded to the edge of the pegboard. The board will be mounted on a pivoting device at the front of the compartment on the top and bottom to allow easy movement in and out of the compartment. The maximum tool load will be 400 pounds. The board will have positive lock in the stowed and extended position. The board will be mounted on adjustable tracks from front to back within the compartment. There will be One (1) tool board(s) provided, will be spatter gray painted, and installed RS1.
- 4.302 PAINTED BODY TRIM PIECE** - Painted trim will be provided on the compartment horizontal body seam on two (2) compartments. The locations will be at compartment break between hatch and upper side compartments, on the SIDES only NOT the rear. The trim will be made of formed aluminum and painted to match the body material as practical. The trim piece will be bonded to the painted surface with a high viscosity adhesive.
- 4.303 COMPARTMENT ABOVE FULL DEPTH SECTION AT REAR** - There will be a compartment provided at the rear wall above the driver side rear of the truck for the FDLER with the door hinge inboard toward the R-1, make sure to use a small magnetic switch for door open, mount the P25 light at the very top, make sure the interior of the compartment is smooth with no obstructions full depth lower extended portion of side body panel. The compartment will be as large as space allows extending thru the rear wall using any available space between the rear compartment, side compartment, and the water tank. A vertically hinged, single pan, aluminum treadplate door with a flush Southco C2 chrome latch will be provided. The door will be hinged along the inboard side of the compartment.
- 4.304 LOCKING NUTS** - The SCBA and hatch compartment doors will have nuts with star washers and blue Loctite®. Locking nuts will be provided for the following areas:
1. Fuel access door hinges.
 2. Pump side panel access doors.
 3. Pump operator's walkway floor compartment doors.
 4. Rear LS compartment and ladder door hinges.
 5. Relay cover shield for electric components at LS frame rail at transmission.
 6. Clamp for step light wires at each crew compartment step.
 7. RS glove box hinge.
 8. Interior cab ceiling mounted storage compartment hinges.
 9. Interior cab ceiling mounted air conditioning filter and pump access door hinge.
 10. Interior cab access door hinge under rear seat transverse compartment.
 11. Interior cab access door hinge for engine and transmission oils.
 12. Exterior cab transverse compartment access door hinges.
- 4.305 RUB RAIL** - The bottom edge of the body panel will have a 2.00" high rubber rub rail the length of the body for protection.
- 4.306 BODY FENDER CROWNS** - Black rubber fender crowns will be provided around the rear wheel openings.

- 4.307 BODY FENDER LINER** - A painted fender liner will be provided. The liners will be removable to aid in the maintenance of rear suspension components.
- 4.308 HANDRAILS** - The handrails will be 1.25" diameter anodized aluminum extrusion, with a ribbed design, to provide a positive gripping surface. Chrome plated end stanchions will support the handrail. Plastic gaskets will be used between end stanchions and any painted surfaces. Drain holes will be provided in the bottom of all vertically mounted handrails. Handrails will be provided to meet NFPA 1901 section 15.8 requirements. The handrails will be installed as noted on the sales drawing.
- 4.309 HANDRAILS** - One (1) vertical handrail will be located on each rear beavertail.
- 4.310 HANDRAIL** - One (1) full width horizontal handrail will be provided below the hose bed at the rear of the apparatus.
- 4.311 ADDITIONAL CENTER STANCHION** - A quantity of two (2) additional center handrail stanchion(s) will be provided on each vertical rear handrail.
- 4.312 AIR BOTTLE STORAGE (Single)** - A quantity of one (1) air bottle compartment, approximately 7.50" wide x 7.50" tall x 26.00" deep, will be provided on the left side rearward of the rear wheels. The compartment will be square with angled corners. A painted stainless-steel door with a Southco raised trigger C2 black lever latch will be provided to contain the air bottle. A dielectric barrier will be provided between the door hinge, hinge fasteners and the body sheet metal. Inside the compartment, black rubber matting will be provided.
- 4.313 AIR PACK STORAGE** - A total of one (1) air pack compartment(s) will be provided and located driver side ahead of the wheel. The air pack compartment(s) will be tapered to match the profile of the space available in the fender. The compartment(s) will be approximately 15.50" wide at the top and 5.00" wide at the bottom for the wheel cutout. The compartment(s) will be 15.50" tall at the body side compartment and 6.00" tall at the wheel cutout. The compartment(s) will be 26.00" deep and have a drain hole. Inside the compartment, black Dura-Surf friction reducing material will be provided. A painted stainless steel hinged door with a Southco raised trigger C2 black lever latch will be provided to contain the air pack. A dielectric barrier will be provided between the door hinge, hinge fasteners and the body sheet metal.
- 4.314 AIR BOTTLE STORAGE (Triple)** - A quantity of one (1) air bottle compartment designed to hold (3) air bottles up to 7.25" in diameter x 26.00" deep will be provided on the right side forward of the rear wheels. A painted stainless-steel door with a Southco raised trigger C2 black lever latch will be provided to contain the air bottle. A dielectric barrier will be provided between the door hinge, hinge fasteners and the body sheet metal. Inside the compartment, black Dura-Surf friction reducing material will be provided.
- 4.315 AIR BOTTLE COMPARTMENT STRAP** - A strap will be provided in the air bottle compartment(s) to help contain the air bottles when the vehicle is parked on an incline. The strap will wrap around the neck and attach to the wall of the compartment.
- 4.316 AIR BOTTLE STORAGE (Double)** - A quantity of one (1) air bottle compartment, 15.25" wide x 7.75" tall x 26.00" deep, will be provided on the right-side rearward of the rear wheels. A painted stainless-steel door with a Southco raised trigger C2 black lever latch will be provided to contain the air bottle. A dielectric barrier will be provided between the door hinge, hinge fasteners and the body sheet metal. Inside the compartment, black Dura-Surf friction reducing material will be provided.
- 4.317 EXTENSION LADDER** - There will be a 24' two-section aluminum Duo-Safety Series 900-A extension ladder provided.
- 4.318 ROOF LADDER** - There will be a 14' aluminum Duo-Safety Series 775-A roof ladder provided.

- 4.319 LADDER STORAGE** - The ladders will be stored between the water tank and the right-side compartments. The ladders will extend into the pump compartment just to the rear of the water pump discharges. The ladder storage area will be enclosed as practical by means of sheet metal to protect the ladders from road dirt. The ladders that extend into the pump house will also be enclosed. A black rubber boot will be provided to enclose the ladders in the gap between the pump house and the body. Each ladder will be stored vertically in a separate stainless steel storage trough. Each stainless-steel trough will be lined with Dura-Surf nylon slides. An aluminum enclosure will be provided at the rear of the body to properly contain the ladders. This enclosure will extend to the rear of the side body compartments. The enclosure will also include a vertically hinged aluminum treadplate door with a pair of Southco raised trigger C2 chrome latches to access the ladders. The door will be hinged on the left side.
- 4.320 FOLDING LADDER** - One (1) 10.00' aluminum, Series 585-A, Duo-Safety folding ladder will be installed in a U-shaped trough inside the ladder storage compartment.
- 4.321 4' PIKE POLE** - Two (2) pike poles Fire Hooks Unlimited RH 4' New York style hook with D-handle will be provided and located ship loose.
- 4.322 8' PIKE POLE** - There will be One (1) pike pole Fire Hooks Unlimited, Model RH-8, 8' pike pole(s) with steel handle and gas shut off end provided. The pike pole(s) will be stored in tubular holders located ladder storage.
- 4.323 8' PIKE POLE** - There will be one (1) Fire Hooks Unlimited, New York Hook, 8' long roof hook with steel shaft and chisel (pry) end provided ladder storage compartment.
- 4.324 6 FT PIKE POLE** - There will be two (2) Fire Hooks Unlimited NY roof hook RH-6, 6-foot pike pole(s) with steel handles and pry end provided ladder storage compartment.
- 4.325 PIKE POLE STORAGE** - Aluminum tubing will be used for the storage of four (4) pike poles and will be located in ladder storage compartment. If the head of a pike pole can come in contact with a painted surface, a stainless steel scuff plate will be provided.
- 4.326 BELL** - A chrome plated, 12.00" bronze cast bell, complete with an eagle, will be mounted through the center of the grille. The bell will be mounted on a flat, saddle welded bracket. The bracket will come out from the round tube on the center of the cab located behind the grille and extend straight out for the bell mounting. The bracket will be painted black. A rope pull for the bell will be installed inside the cab.
- 4.327 WARNING LABEL(S)** - There will be one (1) label(s), indicating "NO STEP", provided on cover over relay in ds frame rail.
- 4.328 FOLDING STEPS FRONT OF BODY** - Folding steps will be provided full height on the left side and right-side body compartments to provide access to the cargo bed. Steps will be spaced evenly on the sales drawing. Actual quantity may vary due to pump panel interferences but will meet the NFPA required maximum stepping height. The Trident steps will be bright finished, non-skid with a black coating. The step will incorporate an LED light to illuminate the stepping surface. The steps can be used as a hand hold with two openings wide enough for a gloved hand.
- 4.329 REAR FOLDING STEPS** - Bright finished, non-skid folding steps with a black coating will be provided at the rear. Each step will incorporate an LED light to illuminate the stepping surface. The steps can be used as a hand hold with two openings wide enough for a gloved hand. Two (2) additional folding steps will be located two (2) on the right-side rear bulkhead. The step(s) will be bright finished, non-skid with a black coating. Each step will incorporate an LED light to illuminate the stepping surface. The step(s) can be used as a hand hold with two openings wide enough for a gloved hand.
- 4.330 STIRRUP STEPS WITH TREAD GRIP** - There will be two (2) stirrup style steps with cable hanger and tread grip rung provided. The step will be installed One each side below the running board at pump panel walkway same locations as previous units 29674. This must be mounted as far out as possible. Previous units were under and smashed one's shin while climbing.
- 4.331 PUMP** - Pump will be a Waterous CSU, 1500 gpm single (1) stage midship mounted centrifugal type. Pump will be the class "A" type. Pump will deliver the percentage of rated discharge at pressures indicated below:

4.331.1 100% of rated capacity at 150 psi net pump pressure.

4.331.2 -70% of rated capacity at 200 psi net pump pressure.

- 4.331.3** -50% of rated capacity at 250 psi net pump pressure.
- 4.331.4** Pump body will be close-grained gray iron, bronze fitted, and horizontally split in two (2) sections for easy removal of the entire impeller shaft assembly (including wear rings).
- 4.331.5** Pump will be designed for complete servicing from the bottom of the truck, without disturbing the pump setting or apparatus piping.
- 4.331.6** Pump case halves will be bolted together on a single horizontal face to minimize chance of leakage and facilitate ease of reassembly. No end flanges will be used.
- 4.331.7** Discharge manifold of the pump will be cast as an integral part of the pump body assembly and will provide a minimum of three (3) 3.50" openings for flexibility in providing various discharge outlets for maximum efficiency.
- 4.331.8** The three (3) 3.50" openings will be located as follows: one (1) outlet to the right of the pump, one (1) outlet to the left of the pump, and one (1) outlet directly on top of the discharge manifold.
- 4.331.9** Impeller shaft will be stainless steel, accurately ground to size. It will be supported at each end by sealed, anti-friction ball bearings for rigid precise support. Impeller will have flame plated hubs assuring maximum pump life and efficiency despite any presence of abrasive matter in the water supply.
- 4.331.10** Bearings will be protected from water and sediment by suitable stuffing boxes, flinger rings, and oil seals. No special or sleeve type bearings will be used.
- 4.331.11** Pump will be equipped with a self-adjusting, maintenance-free, mechanical shaft seal.
- 4.331.12** The mechanical seal will consist of a flat, highly polished, spring fed carbon ring that rotates with the impeller shaft. The carbon ring will press against a highly polished stainless steel stationary ring that is sealed within the pump body.
- 4.331.13** In addition, a throttling ring will be pressed into the steel chamber cover, providing a very small clearance around the rotating shaft in the event of a mechanical seal failure. The pump performance will not deteriorate, nor will the pump lose prime, while drafting if the seal fails during pump operation.
- 4.331.14** Wear rings will be bronze and easily replaceable to restore original pump efficiency and eliminate the need to replace the entire pump casing due to wear.
- 4.332 PUMP TRANSMISSION** - The pump transmission will be made of a three (3) piece, aluminum, horizontally split casing. Power transfer to pump will be through a high strength Morse HY-VO silent drive chain. By the use of a chain rather than gears, 50% of the sprocket will be accepting or transmitting torque, compared to two (2) or three (3) teeth doing all the work. Drive shafts will be 2.35" diameter hardened and ground alloy steel and supported by ball bearings. The case will be designed to eliminate the need for water cooling.
- 4.333 PUMPING MODE** - An interlock system will be provided to ensure that the pump drive system components are properly engaged so that the apparatus can be safely operated. The interlock system will be designed to allow stationary pumping only.
- 4.334 AIR PUMP SHIFT** - Pump shift engagement will be made by a two (2) position sliding collar, actuated pneumatically (by air pressure), with a three (3) position air control switch located in the cab. A manual back-up shift control will also be located on the left side pump panel. Two (2) indicator lights will be provided adjacent to the pump shift inside the cab. One (1) green light will indicate the pump shift has been completed and be labeled "pump engaged". The second green light will indicate when the pump has been engaged, and that the chassis transmission is in pump gear. This indicator light will be labeled "OK to pump". The pump shift will be interlocked to prevent the pump from being shifted out of gear when the chassis transmission is in gear to meet NFPA requirements. The pump shift control in the cab will be illuminated to meet NFPA requirements.
- 4.335 TRANSMISSION LOCK-UP** - The direct gear transmission lock-up for the fire pump operation will engage automatically when the pump shift control in the cab is activated.
- 4.336 INTAKE RELIEF VALVE** - One (1) Trident Air Max intake relief valve(s) will be installed on the suction side of the pump preset at 125 psi. The relief valve will have a working range of 50 PSI to 350 PSI. The outlet will terminate below the frame rails with a 2.50" National Standard hose thread adapter and will have a "do not cap" warning tag. One (1) adjustable air regulator and pressure indicating gauge will be located on a common bezel behind the right-side pump panel with a stainless-steel access door to control the intake valve(s).
- 4.337 PRESSURE GOVERNOR**

- 4.337.1 This apparatus will be equipped with a Class1 "Total Pressure Governor Plus" engine/pump governor/throttle system that is connected directly to the Electronic Control Module (ECM) mounted on the engine. The "Total Pressure Governor" is to operate as a pressure sensor (regulating) governor (PSG).
- 4.337.2 A special preset feature will permit a predetermined pressure of RPM to be set. The preset pressure or RPM will be displayed on the message display of the "Total Pressure Governor". The preset will be easily adjustable by the operator.
- 4.337.3 The pressure sensor governor system will be operable only after the vehicle parking brake has been set, the transmission is the pumping mode, and the fire pump has been engaged.
- 4.337.4 The pressure sensor governor system will have two (2) modes of operation: pressure mode or rpm mode.
- 4.337.5 When in the pressure mode, the PSG system will automatically maintain the discharge pressure set by the operator regardless of flow (within engine/pump operating capabilities).
- 4.337.6 In the rpm mode, the PSG system will automatically maintain a set engine speed, regardless of engine load (within engine operation capabilities).
- 4.337.7 A pump cavitation protection feature will be provided which will return the engine to idle should the pump cavitate.
- 4.337.8 The digital display will include:

- 4.337.8.1 Pump intake pressure
- 4.337.8.2 Pump discharge pressure
- 4.337.8.3 Engine RPM
- 4.337.8.4 Battery voltage
- 4.337.8.5 Oil pressure and temperature
- 4.337.8.6 Coolant temperature
- 4.337.8.7 Transmission Temperature
- 4.337.8.8 Total engine hours
- 4.337.8.9 Total pump hours
- 4.337.8.10 Fuel rate

- 4.338 **PRIMING PUMP** - The priming pump will be a Trident Emergency Products compressed air powered, high efficiency, multistage venturi based AirPrime System, conforming to standards outlined in the current edition of NFPA 1901. All wetted metallic parts of the priming system shall be of brass and stainless-steel construction. One (1) priming control will open the priming valve and start the pump primer.
- 4.339 **LIGHT, ADDITIONAL, FOR THERMAL RELIEF VALVE** - Two (2) of 2" diameter Whelen model T0B00FBR blue LED grommet mounted lights, will be provided in addition to the standard light for indication when the thermal relief valve is operating. Lights will be located on the passenger side and drivers' side on the upper center just behind the FRC light head side of the pump house near the top mount control pump panel, facing to the side of the truck so light is visible from the ground - see photos. These lights will be activated with the main thermal valve indicator light on the pump panel.
- 4.340 **RECIRCULATING LINE WITH CHECK VALVE** - A 0.50" diameter recirculating line, from the pump to the water tank, will be furnished with a control installed on the bracket where the intake relief valve, pump cooler and water strainer is located behind the officer side pump access door. A check valve will be provided in this line to prevent the back flow of water from the tank to the pump if the valve is left in the open position.
- 4.341 **THERMAL RELIEF VALVE** - A Waterous Overheat Protection Manager (OPM) will be included on the pump that monitors pump water temperature and opens to relieve water to cool the pump when the temperature of the pump water exceeds 140 Degrees F (60 C) and a red warning light that is triggered when the water in the pump reaches 180 F (82 C). The warning light will act as an additional protection device if the temperature in the pump keeps rising after the valve opens. The warning light and audible alarm with a test switch will be mounted on the pump operator panel. The discharge line will be plumbed to ground.
- 4.342 **PUMP MANUALS** - There will be a total of two (2) pump manuals provided by the pump manufacturer and furnished with the apparatus. The manuals will be provided by the pump manufacturer in the form of two (2) electronic copies. Each manual will cover pump operation, maintenance, and parts.

- 4.343 PLUMBING, STAINLESS STEEL AND HOSE** - All inlet and outlet lines will be plumbed with either stainless steel pipe, flexible polypropylene tubing or synthetic rubber hose reinforced with hi-tensile polyester braid. All hose's will be equipped with brass or stainless-steel couplings. All stainless-steel hard plumbing will be a minimum of a schedule 10 wall thickness. Where vibration or chassis flexing may damage or loosen piping or where a coupling is required for servicing, the piping will be equipped with victaulic or rubber couplings. Plumbing manifold bodies will be ductile cast iron or stainless steel. All piping lines shall be drained through a master drain valve or will be equipped with individual drain valves. All drain lines will be extended with a hose to drain below the chassis frame. All water carrying gauge lines will be of flexible polypropylene tubing. All piping, hose and fittings will have a minimum of a 500 PSI hydrodynamic pressure rating.
- 4.344 FOAM SYSTEM PLUMBING** - All piping and manifolds that is in contact with the foam concentrate or foam/water solution will be stainless steel. The fittings will be stainless steel or brass. Cast iron pump manifolds will be NOT allowed.
- 4.345 MAIN PUMP INLETS** - A 6.00" pump manifold inlet will be provided on each side of the vehicle. The suction inlets will include removable die cast zinc screens that are designed to provide cathodic protection for the pump, thus reducing corrosion in the pump.
- 4.346 MAIN PUMP INLET CAP PROVIDED BY FIRE DEPARTMENT** - NFPA 1901, 2016 edition, section 16.6.8 requires all intakes must be provided with caps or closures capable of withstanding a hydrostatic gauge pressure of 500 psi. The caps are not on the apparatus as manufactured. The fire department will provide both caps for the main pump inlets.
- 4.347 INTAKE VALVE** - A total of Two (2) TFT model AX1ST-NX- 6" FNST outlet X 5" Storz, jumbo ball intake valves will be provided by vendor.
- 4.348 VALVES** - Two (2) full flow Waterous valves will be used for the side 2.50" discharges. All remaining ball valves, 3.00" or less, will be Akron Brass brand. The Waterous valves will have a solid bronze ball that is chromium plated for a hard, durable surface. The spring-loaded floating seal assembly requires no adjustment yet provides a tight seal against both pressure and vacuum pressures. The Akron valves will be the 8000 series heavy-duty style with a stainless-steel ball and a simple two-seat design. No lubrication or regular maintenance is required on the valve.
- 4.349 LEFT SIDE INLET** - There will be one (1) auxiliary inlet with a 2.50" valve at the left side pump panel, terminating with a 2.50" (F) National Standard hose thread adapter. The auxiliary inlet will be provided with a strainer, chrome swivel and plug. Inlet valve location will be behind the pump panel.
- 4.350 ANODE, INLET** - A pair of sacrificial zinc anodes will be provided in the water pump to protect the pump from corrosion. Two (2) will be placed in the inlet side of the pump and the other in the discharge side of the pump.
- 4.351 INLET CONTROL** - The side auxiliary inlet(s) will incorporate a quarter-turn ball valve with the control located at the top mount control panel. The valve operating mechanism will indicate the position of the valve. There will be one (1) inlet.
- 4.352 INLET BLEEDER VALVE** - A 0.75" bleeder valve will be provided for each side gated inlet. The valves will be located behind the panel with a swing style handle control extended to the outside of the panel. The handles will be chrome plated and provide a visual indication of valve position. The swing handle will provide an ergonomic position for operating the valve without twisting the wrist and provides excellent leverage. The water discharged by the bleeders will be routed below the chassis frame rails. No snubber bleeder valves are acceptable.
- 4.353 TANK TO PUMP** - The booster tank will be connected to the intake side of the pump with 3.00" piping and a quarter turn 3.50" Waterous valve with the control remotely located at the operator's panel. Tank to pump line will run straight (no elbows) from the pump into the front face of the water tank and angle down into the tank sump. A rubber coupling will be included in this line to prevent damage from vibration or chassis flexing. A check valve will be provided in the tank to pump supply line to prevent the possibility of "back filling" the water tank.
- 4.354 TANK REFILL** - A 1.50" combination tank refill and pump re-circulation line will be provided, using a quarter-turn full flow ball valve controlled from the pump operator's panel.

- 4.355 LEFT SIDE DISCHARGE OUTLETS** - There will be Two (2) discharge outlets with a 2.50" valve on the left side of the apparatus, terminating with a 2.50" (M) National Standard hose thread adapter.
- 4.356 RIGHT SIDE DISCHARGE OUTLETS** - There will be One (1) discharge outlet with a 2.50" valve on the right side of the apparatus, terminating with a 2.50" (M) National Standard hose thread adapter. There will be a 4.00" discharge outlet with a 3.00" valve with a 3.00" ball, installed on the right side of the apparatus, terminating with a 4.00" (M) National Standard hose thread adapter. This discharge outlet will be actuated with a handwheel control with position indicator at the pump operator's control panel.
- 4.357 REAR DISCHARGE OUTLET** - There will be One (1) discharge outlet piped to the rear of the hose bed, left side, installed so proper clearance is provided for spanner wrenches or adapters. Plumbing will consist of 2.50" piping along with a 2.50" full flow ball valve with the control from the pump operator's panel.
- 4.358 DISCHARGE CAPS/ INLET PLUGS** - Chrome plated, rocker lug, caps with vinyl covered cables will be furnished for all discharge outlets 1.00" thru 3.00" in size, besides the pre-connected hose outlets. Chrome plated, rocker lug, plugs with vinyl covered cables will be furnished for all auxiliary inlets 1.00" thru 3.00" in size. The caps and plugs will incorporate a thread design to automatically relieve stored pressure in the line when disconnected.
- 4.359 OUTLET BLEEDERS** - A 0.75" bleeder valve will be provided for each outlet 1.50" or larger. Automatic drain valves are acceptable with some outlets if deemed appropriate with the application. The valves will be located behind the panel with a swing style handle control extended to the outside of the side pump panel. The handles will be chrome plated and provide a visual indication of valve position. The swing handle will provide an ergonomic position for operating the valve without twisting the wrist and provides excellent leverage. Bleeders will be located at the bottom of the pump panel. They will be properly labeled identifying the discharge they are plumbed in to. The water discharged by the bleeders will be routed below the chassis frame rails. No snubber drain valves are acceptable.
- 4.360 LEFT SIDE OUTLET ELBOWS** - The 2.50" discharge outlets located on the left side pump panel will be furnished with a 2.50" (F) National Standard hose thread x 2.50" (M) National Standard hose thread, chrome plated, 45-degree elbow. The elbow will be Pierce VLH, which incorporates an exclusive thread design to automatically relieve stored pressure in the line when disconnected.
- 4.361 RIGHT SIDE OUTLET ELBOWS** - The 2.50" discharge outlets located on the right-side pump panel will be furnished with a 2.50" (F) National Standard hose thread x 2.50" (M) National Standard hose thread, chrome plated, 45-degree elbow. The elbow will be Pierce VLH, which incorporates an exclusive thread design to automatically relieve stored pressure in the line when disconnected.
- 4.362 ADDITIONAL RIGHT SIDE OUTLET ELBOWS** - The 4.00" discharge outlets, located on the right side pump panel, will be furnished with a 4.00" (F) National Standard hose thread x 5.00" Storz, elbow.
- 4.363 REAR OUTLET ELBOWS** - The 2.50" discharge outlets located at the rear of the apparatus will be furnished with a 2.50" (F) National Standard hose thread x 2.50" (M) National Standard hose thread, chrome plated, 45-degree elbow. The elbow will be Pierce VLH, which incorporates an exclusive thread design to automatically relieve stored pressure in the line when disconnected.
- 4.364 DISCHARGE DRAIN VALVES** - Provide a manual style drain in all low plumbing points that would normally have automatic drains.
- 4.365 DISCHARGE OUTLET CONTROLS** - The discharge outlets will incorporate a quarter-turn ball valve with the control located at the pump operator's panel. The valve operating mechanism will indicate the position of the valve. If a handwheel control valve is used, the control will be a minimum of a 3.9" diameter stainless steel handwheel with a dial position indicator built into the center of the handwheel. Any 3.00 inch or larger discharge valve will be a slow-operating valve in accordance with NFPA 16.7.5.3.
- 4.366 DELUGE OUTLET SPECIAL INSTRUCTIONS** - The deluge gun outlet will be located to the front wall so the monitor will mount on the extend-a-gun in the retracted position, and the monitor pointing to the officer side. Vendor shall ensure the monitor does not hit the hose reel.

- 4.367 DELUGE RISER** - A 3.00" deluge riser will be installed above the pump in such a manner that a monitor can be mounted and used effectively. Piping will be rigidly braced and installed securely so no movement develops when the line is charged. The riser will be gated and controlled at the pump operator's panel. Any 3.00 inch or larger discharge valve will be a slow-operating valve in accordance with NFPA 16.7.5.3.
- 4.368 TELESCOPIC PIPING** - The deluge riser piping will include an 18.00" Task Force Model XG18 Extend-A-Gun extension. This extension will be telescopic to allow the deluge gun to be raised 18.00" increasing the range of operation. A position sensor will be provided on the telescopic piping that will activate the "do not move vehicle" light inside the cab when the monitor is in the raised position.
- 4.369 MONITOR** - A Task Force Crossfire XFC-52 monitor package will be furnished and properly installed on the deluge riser. The monitor will include a M-R nozzle, 10" stream straightener and quad stacked tips. The portable base unit with folding legs and a safety valve will have (2) 2.50" female NST inlets. The monitor will be painted as provided by monitor manufacturer. The deluge riser Extend-a-Gun will have provisions for direct mounting a Task Force Tips CrossFire monitor.
- 4.370 SPEEDLAYS WITH TRAY –**
- 4.370.1** Ahead of the pump enclosure will be two (2) 1.75" speedlay hose beds. Each bed will have a 2.00" pre-connect line with a 2.00" quarter-turn ball valve and terminate with a 1.50" National Standard hose thread 90-degree swivel. The swivel will be located at the top of the speedlay compartment to allow easy removal of the hose in either direction.
- 4.370.2** Individual controls for the speedlays will be at the pump operator's panel.
- 4.370.3** Each compartment will be capable of carrying 200 feet of 1.75" double jacketed hose with the one (1) compartment located above the other.
- 4.370.4** A removable tray will be provided for each speedlay hose bed. The speedlay trays will be constructed of black poly to provide a lightweight sturdy tray. Two (2) hand holes will be in the floor and additional hand holes will be provided in the sides for easy removal and installation from the compartment. The floor of the trays will be perforated to allow for drainage and hose drying. The bottom of the speedlay compartments will be lined with stainless steel to allow the tray to slide with ease. Scuff plates will be provided on both sides, at the sides and bottom of each opening to protect the paint.
- 4.371 SPEEDLAY HOSE RESTRAINT** - A 2.00" black nylon webbing design restraint will be provided across the ends of speedlay(s) to secure the hose during travel. The webbing assembly must be attached at the bottom of the speedlay(s) with footman loops as a permanent attachment and is attached at the top with 2.00" hook and loop fastener(s). Two (2) 90-degree swivel elbow will be located make sure the swivels are as far outboard as possible, accessible from the ground.
- 4.372 BOOSTER HOSE REELS –**
- 4.372.1** Two (2) Hannay electric rewind booster hose reels will be installed over the pump in a recessed open compartment, one each side.
- 4.372.2** The rewind provided on each reel will be horizontal versus the standard vertical.
- 4.372.3** The exterior finish of the reel will be painted job color matching the body exterior.
- 4.372.4** A polished stainless-steel roller and guide assembly will be mounted on each side of the apparatus.
- 4.372.5** Discharge controls will be provided at the pump operator's panel. Plumbing to the reels will consist of 1.50" Aeroquip hose and 1.50" valves.
- 4.372.6** Reel motors shall be protected from overload with a circuit breaker rated to match the motors.
- 4.372.7** Electric rewind control shall be two (2) rubber covered buttons, one (1) mounted on each pump panel adjacent to the hose reel need to add another deutch connector that is 2 feet away from the pump panel to make it easier to remove the panel and disconnect the wire.
- 4.372.8** Booster hose, 1.00" diameter and 200 feet long, with chrome plated Barway, or equal couplings will be provided on each reel.
- 4.372.9** Working pressure of the booster hose will be a minimum of 800 psi.
- 4.372.10** Capacity of the hose reel will be 200 feet of 1.00" booster hose.

4.373 BOOSTER REEL HOSE RESTRAINT - A two (2) tulip clip style clamp part no. 72-0011 will be provided for restraining the booster reel hose. The tulip clip will be attached to the body or pumphouse in Dealer to Supply.

4.374 FOAM SYSTEM -A Husky foam proportioning system will be provided that is an on-demand type, balanced pressure system suitable for all types of foam concentrates. The system will automatically balance and proportion foam solution at rates from 1 percent to 6 percent regardless of variations in water pressure and flow, up to the maximum rated capacity of the foam concentrate pump. The design of the system will allow operation from draft, hydrant, or relay operation.

4.375 FOAM System Capacity - The system will have the ability to deliver the following minimum foam solution flow rates:

4.375.1 30 gpm foam concentrate = 500 gpm foam solution @ 6 percent

4.375.2 30 gpm foam concentrate = 1000 gpm foam solution @ 3 percent

4.375.3 30 gpm foam concentrate = 3000 gpm foam solution @ 1 percent

4.375.4 (Maximum capacity will be limited to the water pump/plumbing capacity)

4.375.5 All foam solution discharges will be independent of the other discharges and be capable of foam or water operation, regardless of the status of other foam outlets. Individual foam concentrate metering valves will allow operation various outlets at different concentrations simultaneously, as conditions dictate.

4.376 Balance Pressure Control System

4.376.1 A Husky digital foam pressure manager will be provided for the management of a hydraulic foam pump drive system. The Husky foam pressure manager will monitor the water and foam pressures by way of precision electric pressure transducers. The Husky foam pressure manager will then control the displacement of a piston type hydraulic pump. The varying displacement of the pump will result in the varying of the rotational speed of a gear type foam pump. Varying the speed of the foam pump will result in the varying of the foam pressure delivered by the foam pump. The varying pressure will be precisely controlled and matched to the operational water pressure in the pumping system at a given time. The resultant balance will be the basis for proportioning of foam concentrate into water by way of the metered venturi balance pressure method. Energizing the Husky foam pressure manager will start the foam system in the automatic pressure balance mode. The foam proportioning will not impose an electrical load on the vehicle electrical system any greater than five (5) amps at 12VDC.

4.376.2 The Husky foam pressure control system will feature a manual override system. The manual override will consist of a change over valve and manual control proportional valve. The manual override valves will be mounted to the control panel. The manual override system will operate without any electrical power and override the Husky electronic system at any time that the changeover valve is moved to the manual position. An analog differential pressure gauge that displays the foam/water pressure balance will be provided and placed near the manual controls. This gauge will be centered in its display when the foam/water pressures are equal and will move to one side or the other when the pressures are unequal.

4.377 Hydraulic Drive System - The foam concentrate pump will be powered by a hydraulic drive system, which is PTO driven and activated by a PTO switch in the cab. A hydraulic oil reservoir will be provided with a maximum of five (5) gallons. The reservoir will be located to facilitate checking oil level or adding oil without spillage or the need to remove access panels. A hydraulic oil cooler will be provided to automatically prevent overheating of the hydraulic oil, which is detrimental to system components. An oil cooler will be provided so as to allow continuous system operation without allowing hydraulic oil temperature to exceed 180 degrees Fahrenheit. A system relief valve will be provided which is designed to protect drive system components and prevent over pressuring the foam concentrate pump. The relief valve will not come in contact with foam concentrate, which can cause clogging.

- 4.378 Foam Concentrate Pump** - An Edwards Manufacturing Model 20 foam pump will be supplied. The foam concentrate pump will be of positive displacement self-priming spur gear design, driven by a hydraulic motor. The pump will be constructed of bronze body, gears, and cover plates, stainless steel shafts, with bronze sleeve bearings to support the gear shafts. The foam concentrate pump will have minimum capacity for 30 gpm at 250 psi with all types of foam concentrates with a viscosity below 3200 cps including protein, fluoroprotein, AFFF, FFFP, or AR-AFFF. The system will deliver only the amount of foam concentrate flow required, without recirculating foam back to the storage tank. The foam concentrate pump will be self-priming and have the ability to draw foam concentrate from external supplies such as drums or pails.
- 4.379 External Foam Concentrate Connections** - External concentrate connections with ball valves having 1.50" female swivel thread will be provided. There will be one (1) provided and equipped with plugs and chains. The connections will be located on the left side pump panel. These connections will permit the uninterrupted external pick-up of foam concentrate when the on-board tank is depleted. A 1.50" flexible tube with 1.50" male NST thread will be provided and shipped loose. A 1.50" male NST concentrate discharge connection will be included. The discharge will be located on the left side control panel.
- 4.380 Strainer** - A wye strainer with stainless steel screen will be installed ahead of the foam concentrate pump inlet port. The strainer will have a NST threaded cap on the screen access to facilitate rapid removal and cleaning of the screen. A ball valve will be mounted to the cap. The ball will be for the purpose of draining the strainer and performing a blow out of debris from the strainer by use of the flush system.
- 4.381 Flush System** - A system flush will be provided to allow the system to flush all foam concentrate with clear water. A control will be provided inside the right-side pump panel area, behind an access door. The flush valve will have ON and OFF indicator LEDs on the pump panel, near the foam system controls.
- 4.382 Foam Tank** - A tank selector must be provided at the pump operator's panel. This remote control to actuate pneumatic valves located as low as possible for optimum system performance.
- 4.383 Foam Tank Fill** - A foam tank fill valve will be provided that is connected to the foam concentrate manifold system. The tank fill valve will allow for the refilling of the foam tank by way of the foam pump. The tank fill valve will be an electrically controlled 0.50" valve, with a five light LED position indicator for the valve.
- 4.384 Foam Concentrate Metering Valves** - An individual adjustable metering valve will control foam concentrate at each foam discharge connection. The valve will be manually operated and infinitely adjustable from 1 percent to 6 percent. The valve will include full 360-degree scale indicator plate with an adjustable metal pointer to indicate concentrate rate. The valve will have the ability to be externally recalibrated to suit new types of foam concentrates without the need to disassemble the valve or remove it from the vehicle.
- 4.385 Ratio Flow Proportioner** - Each foam discharge connection will be provided with an individual proportioner which has a solution capacity equal to the maximum capacity of the discharge. A check valve will be provided upstream of each ratio controller in the foam concentrate piping to ensure that water cannot back flow into the foam concentrate supply, from a ratio controller.
- 4.386 4.00" FOAM METERING AND RATIO CONTROL**
- 4.386.1** A total of two (2) discharges with 4.00" ratio controllers will be provided, in the following locations large diameter discharge and the deluge outlet.
- 4.386.2** The metering valve will be a needle valve design, with a minimum of 270-degree travel, to allow for extremely accurate calibration. The metering valve that supplies the ratio controller will be of brass and stainless-steel construction.
- 4.386.3** A blocking valve will be installed in the metering valve discharge line to allow the metering valve to be in a preset percentage of injection position.
- 4.386.4** The blocking valve will be actuated by a pneumatic actuator, with a guarded pneumatic switch on the pump operator's panel.
- 4.386.5** The blocking valve control will include open (green) and closed (red) LED indicator lights to alert the operator of the position of the blocking valve.
- 4.386.6** The discharges with 4.00" ratio controller will have a flow range of 500 to 1,600 GPM.

4.387 2.00" FOAM METERING AND RATIO CONTROL

- 4.387.1** A total of two (2) discharges with 2.00" ratio controllers will be provided, in the following locations both crosslays.
- 4.387.2** The metering valve will be a needle valve design, with a minimum of 270-degree travel, to allow for extremely accurate calibration. The metering valve that supplies the ratio controller will be of brass and stainless-steel construction.
- 4.387.3** A blocking valve will be installed in the metering valve discharge line to allow the metering valve to be in a preset percentage of injection position.
- 4.387.4** The blocking valve will be actuated by a pneumatic actuator, with a guarded pneumatic switch on the pump operator's panel.
- 4.387.5** The blocking valve control will include open (green) and closed (red) LED indicator lights to alert the operator of the position of the blocking valve.
- 4.387.6** The discharges with 2.00" ratio controller will have a flow range of 40 to 250 GPM.

4.388 3.00" FOAM METERING AND RATIO CONTROL

- 4.388.1** A total of one (1) discharge with 3.00" ratio controllers will be provided, in the following locations 2.5 " right side outlet.
- 4.388.2** The metering valve will be a needle valve design, with a minimum of 270-degree travel, to allow for extremely accurate calibration. The metering valve that supplies the ratio controller will be of brass and stainless-steel construction.
- 4.388.3** A blocking valve will be installed in the metering valve discharge line to allow the metering valve to be in a preset percentage of injection position.
- 4.388.4** The blocking valve will be actuated by a pneumatic actuator, with a guarded pneumatic switch on the pump operator's panel.
- 4.388.5** The blocking valve control will include open (green) and closed (red) LED indicator lights to alert the operator of the position of the blocking valve.
- 4.388.6** The discharges with 3.00" ratio controller will have a flow range of 80 to 650 GPM.

4.389 FOAM GENERATING SYSTEM, CAF - A Pierce Hercules® system rated to provide 200 cfm capacity for generating compressed air foam will be provided. The system will supply six (6) discharges with compressed air foam. It will be capable of providing foam solution or compressed air foam from any of the specified CAFS discharges simultaneously. In addition, the consistency of the compressed air foam (wet to dry) from each discharge will be adjustable. All CAF capable discharges will have the discharge valve control, air injection control, and discharge pressure gauge mounted in a group on the operator's panel. Each CAF capable discharge will feature a wafer type check valve to prevent reverse flows of compressed air foam that is integrated into the discharge valve. The wafer check valve will be a type and design approved by the manufacturer of the discharge valve.

4.390 DISCHARGES TO CAF CAPABLE - The two (2) speedlays, passenger side booster reel, passenger side 2.5", rear 2.5" and monitor discharges will be capable of discharging compressed air foam. There is no second pump on the vehicle.

4.391 AIR COMPRESSOR

- 4.391.1** A Pierce Hercules® oil flooded rotary screw compressor rated at 200cfm @ 130psig will be provided. The compressor will be mounted between the chassis frame rails. The compressor will be driven by the vehicle transmission through a clutch type PTO. All components of the system will be sized and rated for the system to deliver compressed air, uninterrupted, for up to 2 hours at a time without undue stresses, vibrations, or overheating. The air compressor will be capable of delivering the rated capacity of the compressor when the fire pump is delivering 400gpm @150psi from tank or draft.
- 4.391.2** All components of the air compressor system will be readily available on the domestic air compressor market (USA). The compressor will be designed and assembled by Pierce Manufacturing using standard components available to air compressor OEM's.
- 4.391.3** The PTO will be a 10 bolt SAE type mounted to the PTO opening of the vehicle's Allison transmission. The PTO will be rated for at least 20 percent more torque throughput than the air compressor will demand.

- 4.391.4** The air/oil separator for the compressor system will be easily serviced. The separator will be inside the air/oil receiver tank. The separator will consist of two stages. The first stage being a centrifuge arrangement engineered into the tank. The second stage will be a dual cartridge arrangement featuring an "inside to outside" flow of the air through the cartridges. The separation system will be capable of a 250 SCFM flow at 40 psi tank pressure. The allowable oil carry over will be no more than 10 parts per million oil in air.
- 4.391.5** A steel air/oil receiver tank will be provided. The tank will be constructed and tested to the applicable standards as addressed by NFPA 1901 for CAF system air compressor tanks. The tank will be mounted in a manner that allows easy access to the fill opening and the level sight gauges. The tank will be of the vertical type with the minimum pressure valve of the compressor system integrated into the top of the tank. The minimum pressure valve will be rotatable to facilitate different discharge arrangements from the tank.
- 4.391.6** The compressor lubricant will be filtered by cartridge type filter. The filter will have a 25-micron rating and a safety bypass valve. The filter assembly will be mounted and located in a manner that allows easy service. A thermostat valve will be integrated into the oil filter assembly's housing. The thermostat will route lubricant to the oil cooler to maintain the compressors temperature between minimum and maximum limits.
- 4.391.7** A water/oil cooler will be provided to cool the compressor. The cooler will be sized to meet the duty cycle requirements as specified. The oil cooler will use water from the vehicle fire pump as the cooling medium and will be protected from freezing by adequate drains and other means.
- 4.391.8** A heavy duty, automotive type, dry element air cleaner will be provided. The air cleaner will be mounted in such a manner as to be easily serviced. The air cleaner will be mounted, or the inlet of the filter routed, in such a manner that the air cleaner intakes fresh air from outside the vehicle body.
- 4.391.9** The system will have the following safety or monitoring devices:
- 4.391.9.1** Minimum pressure valve
 - 4.391.9.2** Compressor lube temperature gauge
 - 4.391.9.3** Compressor system pressure gauge
 - 4.391.9.4** Air flow meter
 - 4.391.9.5** Compressor lube temperature warnings, audible and visible
 - 4.391.9.6** High pressure relief valve on receiver tank
 - 4.391.9.7** Applicable warning and information decals
- 4.391.10** The compressors PTO controls will be installed in such a manner as to render the PTO inoperative if the fire pump is not engaged. Further, the air compressor's PTO engagement will be prevented at compressor pressures above 10 psi at compressor re-start. The air compressor will be controlled by a modulating inlet valve mounted on the air compressors inlet port. A controller will be provided that senses air pressure and controls the delivery volume of the air compressor while maintaining a constant pressure. The controller will feature an automatic balancing system to maintain the air pressure within plus or minus 5% of the discharge pressure of the fire pump, throughout a pressure range of 60psi to 130psi.
- 4.391.11** The compressor system will have operators controls at the pump panel for the following functions.
- 4.391.12** Automatic pressure regulation, to match the compressor discharge pressure to the pump discharge pressure.
- 4.391.13** Fixed pressure regulation, to set the air pressure at on pressure for the use of air tools, etc.
- 4.391.14** PTO engagement switch
- 4.391.15** PTO engaged indicator light.
- 4.392 AIR TOOL OUTLET** - A 1.00" air outlet supplied by the CAFS compressor shall be provided on the pump operators panel for a side mount pumphouse and on the left pump panel for a top mount pumphouse. This outlet will have a chrome plated 1.0" FNST swivel fitting at the panel and a valve behind the pump panel. The outlet will be capable of supplying the capacity of the compressor. A mating 1.0" MNST x 1.0" NPT fitting will be supplied with loose equipment.
- 4.393 HERCULES CAFS AIR INJECTION VALVE CONTROL(S)** - No guards will be provided over the Hercules CAFS injection switch control(s).

- 4.394 HERCULES CAFS AIR INJECTION VALVE CONTROL(S)** - All of the CAFS air injection valve(s) will be controlled by a rocker switch. The switching will be momentary type of switches, interlocked to the CAFS compressor on/off switch. The CAFS air injection valve(s) will return to closed when the air compressor on/off switch is turned to off.
- 4.395 DUAL FOAM TANK REFILL**
- 4.395.1** The foam system's main proportioning pump will be used to fill the largest foam tank on the truck. This foam tank fill system is an integral part of the main foam system. This will allow use of the auxiliary foam pick-up to pump the foam from pails or a drum on the ground into the foam tank.
- 4.395.2** A separate 14 GPM air operated foam tank fill pump will be used to fill the smallest foam tank on the truck. A separate 1.00" MNST inlet connection, mounted on the right pump panel will be provided for this foam fill system. The gateable tank fill valve will be an electrically controlled 0.50" valve, with LED position indicators for the valve. When the foam tank is full, as determined by a float switch in the foam tank dome, the foam tank fill valve will automatically close and the LED indicators on the foam tank fill valve controller will flash to indicate the foam tank is full. As soon as the float switch drops to a safe level, the LED indicators will stop flashing.
- 4.395.3** A 1.00" flexible hose with an end for insertion into foam containers will be provided. A hose will be supplied with a 1.00" female swivel NST thread swivel connector. The hose will be shipped loose.
- 4.396 GUARD, TOGGLE SWITCH** - The six (6) foam control switches will have a guard over the toggle switch.
- 4.397 FOAM SYSTEM TRAINING** - The fire department will be provided training for the foam / CAFS system installed on their apparatus. The operation of the systems will only be demonstrated by factory approved or certified personnel. This demonstration will include:
- 4.397.1** A review of the foam system manual, emphasizing key areas
- 4.397.2** A walk around review of the system components on the finished truck
- 4.397.3** A hands-on foam / CAFS system startup and foam discharge session
- 4.397.4** Instructions on the use of the manual overrides
- 4.397.5** A demonstration explaining the proper way to shut down and flush the foam system.
- 4.398 FOAM TANK** - The foam tank will be an integral portion of the polypropylene water tank. The cell will have a capacity of 300 gallons of foam with the intended use of Class B foam. The brand of foam stored in this tank will be AR AFFF. The foam cell will not reduce the capacity of the water tank. The foam cell will have a screen in the fill dome and a breather in the lid.
- 4.399 FOAM TANK DRAIN** - The foam tank drain will be a 2.50" drain valve terminating in a male 2.50" NST thread located under the right body compartment. The drain will have a chrome plated cap and chain.
- 4.400 FOAM CELL** - The foam cell will be an integral portion of the polypropylene water tank. The cell will have a capacity of 40 gallons of foam with the intended use of Class A foam. The brand of foam stored in this cell will be TBD. The foam cell will reduce the water capacity of the tank. The foam cell will have a screen in the fill dome and a breather in the lid.
- 4.401 FOAM TANK DRAIN** - The foam tank drain will be a 1.00" drain valve located inside the pump compartment accessible through a door on the right-side pump panel.
- 4.402 PUMP COMPARTMENT** - The pump compartment will be separate from the hose body and compartments so that each may flex independently of the other. It will be a fabricated assembly of steel tubing, angles and channels which support both the fire pump and the side running boards. Compartment will be mounted on chassis frame rails with rubber biscuits in a four (4) point pattern to allow for chassis frame twist. Pump compartment, pump, plumbing and gauge panels will be removable from the chassis as a single assembly.
- 4.403 PUMP MOUNTING** - Pump will be mounted to a substructure which will be mounted to the chassis frame rail using rubber isolators. The mounting will allow chassis frame rails to flex independently without damage to the fire pump.

- 4.404 PUMP CONTROL PANELS (Top Mount)** - All pump controls and gauges must be properly marked and located above the pump to the rear of the walkway. Operator to face the rear of the truck when viewing the control panel from the operating position. The control panel will be in two planes. The upper plane will be hinged at the bottom with a full-length stainless-steel hinge. Both planes must be full width of the pump house structure. The side pump panels will be 60.00" wide. The side pump panels will be removable for ease of maintenance. Polished stainless steel trim collars must be installed around all inlets and outlets. Controls will have chrome plated bezels encircling the opening securely mounted to the pump panel. Identification tags for the discharge controls will be located directly below the control handle and recessed within the same casting as the guide. All remaining identification tags will be mounted on the pump panel in chrome plated bezels.
- 4.405 WALKWAY** - A 19.00" wide walkway will be provided for access to the top control panel. The walkway will be constructed of bright aluminum treadplate and properly reinforced. There will be six (6) white LED lights provided to illuminate the walkway. The lights will come on with the body perimeter lights.
- 4.406 WALKWAY TOOL COMPARTMENT** - A tool compartment will be provided on each side of the walkway. Each compartment will have an aluminum treadplate door and will be equipped with two (2) white LED lights with chrome bezels, one (1) in each compartment. The following drawing(s) will be provided for approval by City. The drawing(s) will be made to match 34844 "FOAM CELL CAPACITY 300 GALLONS" must be red with white lettering, mtd below foam level gauge, and "WATER CAPACITY 750 GALLONS" must be blue with white lettering mtd below water level gauge similar Pierce job number.
- 4.407 PUMP OPERATOR'S PANEL DRAWING**
- 4.407.1** A detailed drawing to scale of the pump operator's panel will be provided for the City to review. The drawing will include all of the gauges, controls, switching, etc., located on the pump operator's panel. City will be allowed to make changes and/or mark-ups to this approval drawing. The fire apparatus manufacturer will make revisions (If needed) to the drawing per the City's changes and/or mark-ups as long as the changes are physically possible within a specific product line.
- 4.407.2** The finalized and signed customer approved pump operator's panel drawing will become part of the contract documents.
- 4.407.3** Due to the way drain(s), bleeder(s), operational/maintenance tag(s) and NFPA required warning tag(s) are placed on pump panel(s), these items will NOT be shown on any pump panel approval drawing(s). These item(s) will be placed on pump panel(s) at the fire apparatus manufacturer's discretion.
- 4.408 REMAINING PUMP PANEL(S)** - Detailed drawing(s) to scale of the remaining pump panel(s) will be provided for City to review. The drawing(s) will include all of the gauges, controls, switching, etc., located on the pump panel(s). City will be allowed to make changes and/or mark-ups to these approval drawing(s). The fire apparatus manufacturer will make revisions (If needed) to the drawing(s) per the City's changes and/or mark-ups as long as the changes are physically possible within a specific product line. - The finalized and signed City approved pump panel drawing(s) will become part of the contract documents. Due to the way drain(s), bleeder(s), operational/maintenance tag(s) and NFPA required warning tag(s) are placed on pump panel(s), these items will NOT be shown on any pump panel approval drawing(s). These item(s) will be placed on pump panel(s) at the fire apparatus manufacturer discretion.
- 4.409 COLOR CODED TAGS** - A detailed drawing/chart of the colors used on all of the inlet(s) and outlet(s) will be provided for the customer to review. City will be allowed to make changes and/or mark-ups to this approval drawing/chart. The fire apparatus manufacturer will make revisions (If needed) to the drawing per City's changes and/or mark-ups as long as the changes are physically possible within a specific product line. The finalized and signed City approved drawing/chart of the colors will become part of the contract documents.
- 4.410 SPECIAL TEXT/VERBIAGE TAGS** - A detailed drawing/chart of the text/verbiage used on all of the inlet(s) and outlet(s) will be provided for City to review. City will be allowed to make changes and/or mark-ups to this approval drawing/chart. The fire apparatus manufacturer will make revisions (If needed) to the drawing per City's changes and/or mark-ups as long as the changes are physically possible within a specific product line. The finalized and signed customer approved drawing/chart of the text/verbiage will become part of the contract documents.

- 4.411 PUMP PANEL CONFIGURATION** - the pump panel configuration will be arranged and installed in an organized manner that will provide user-friendly operation.
- 4.412 PUMP AND GAUGE PANEL** - The side control panels will be constructed of aluminum with a black vinyl finish. A polished aluminum trim molding will be provided around each panel. The gauge and top mount control panels will be constructed of aluminum with a black vinyl finish. A polished aluminum trim molding will be provided around each panel. The gauge panel will be hinged at the bottom with a full-length stainless-steel hinge. The fasteners that hold the panel in the upright position will be quarter-turn style. Vinyl covered chains will be used to hold the panel in the dropped position.
- 4.413 PUMP ACCESS PANELS** - Removable access panels will be provided on the left and right-side pump panels for access to pump and plumbing. The panels will be segmented for several inlets or outlets that are close in proximity. Panels must be secured with trigger type lever latches. On the front of the pump house structure, provisions will be provided for access to the pump. The panels will be sized as large as possible.
- 4.414 NFPA COMPLIANCY** - NFPA 1901, 2016 edition, section 15.6.2 (Pump and plumbing access) - The clear door opening will have no one dimension measure less than 18in. The segmented pump panels will be removable and allow as much pump and plumbing access as possible, but some of the access doors might not meet the NFPA requirement for minimum clear door opening standards. This apparatus will be non-compliant to 2016 NFPA 1901 standards effective at time of contract execution.
- 4.415 PUMP COMPARTMENT LIGHT** - A pump compartment light will be provided inside the right-side pump enclosure and accessible through a door on the pump panel. A .125" weep hole will be provided in each light lens, preventing moisture retention.
- 4.416 PUMP PANEL GAUGES AND CONTROLS**
- 4.416.1** The following will be provided on the pump and gauge panels in a neat and orderly fashion. These gauges will be in addition to what is provided with the pressure controller.
 - 4.416.2** Engine Oil Pressure Gauge: With visual and audible warning
 - 4.416.3** Engine Water Temperature Gauge: With visual and audible warning
 - 4.416.4** Tachometer: Electric
 - 4.416.5** Master Pump Drain Control
 - 4.416.6** Voltmeter
 - 4.416.7** Fuel
- 4.417 THROTTLE READY GREEN INDICATOR LIGHT** - There will be a green indicator light integrated with the pressure governor and/or engine throttle installed on the pump operators panel that is activated when the pump is in throttle ready mode.
- 4.418 INDICATOR LIGHTS AT PUMP PANEL** - The following indicator lights will be provided at the pump panel. These will be in addition to the indicators included with the pressure controller. Check Transmission Warning Indicator light. Stop Engine Warning Indicator light. Check Engine Warning Indicator light.
- 4.419 OK TO PUMP INDICATOR LIGHT** - There will be a green indicator light installed on the pump operators panel that is activated when the pump is in Ok to Pump mode.
- 4.420 PUMP ACCESS DOOR LATCHES** - four (4) pump access door(s) will be provided with Southco non-locking C2 latches to hold the doors in the closed position in place of standard. Latch(es) will be provided on the pump access door(s) located DS and PS access doors, use chrome plated latches, not black, match 29674, but move the PS door 1" higher.
- 4.421 HANDWHEEL OUTLET CONTROLS** - The control for one (1) will be 6.25" handwheel control with indicators. The control will include all u-joints with rubber coverings. The discharge outlets with handwheels will be LDH.
- 4.422 PUMP OVERHEAT INDICATOR LIGHT** - A pump overheat indicator light with bell, will be installed at the pump operator's panel and will be activated with the battery switch. The pump overheat system will go off around approximately 140 degrees. A test button will be provided at the pump operator's panel. The bell will be located in the pump area on the wall toward the rear of the truck right side.

4.423 PUMP PANEL RECESS - There will be a recessed box located on the pump panel to allow for installation of the pressure governor. There will be a polished stainless-steel door, hinged at the side, provided. L100 hood light above switch panel. Switch order from top to bottom: panel lights, pump engaged, front flood, dr flood, ps flood, rear scene. On top mount pump operator's panel.

4.424 PUMP TO TANK LINKAGE – A standard plastic bezel will be provided around the tank to pump control. The linkage will open the valve all the way by using the longest hole in the valve handle.

4.425 VACUUM AND PRESSURE GAUGES

4.425.1 The pump vacuum and pressure gauges will be liquid filled and manufactured by Class 1 Incorporated ©.

4.425.2 The gauges will be a minimum of 4.00" in diameter and will have white faces with black lettering, with a pressure range of 30.00"-0-600#.

4.425.3 Gauge construction will include a Zytel nylon case with adhesive mounting gasket and threaded retaining nut.

4.425.4 The pump pressure and vacuum gauges will be installed adjacent to each other at the pump operator's control panel.

4.425.5 Test port connections will be provided at the pump operator's panel. One will be connected to the intake side of the pump, and the other to the discharge manifold of the pump. They will have 0.25 in. standard pipe thread connections and non-corrosive polished stainless steel or brass plugs. They will be marked with a label.

4.425.6 This gauge will include a 10-year warranty against leakage, pointer defect, and defective bourdon tube.

4.426 PRESSURE GAUGES

4.426.1 The individual "line" pressure gauges for the discharges will be Class 1© interlube filled.

4.426.2 They will be a minimum of 2.00" in diameter and have white faces with black lettering.

4.426.3 Gauge construction will include a Zytel nylon case with adhesive mounting gasket and threaded retaining nut.

4.426.4 Gauges will have a pressure range of 30"-0-400#.

4.426.5 The individual pressure gauge will be installed as close to the outlet control as practical.

4.426.6 This gauge will include a 10-year warranty against leakage, pointer defect, and defective bourdon tube.

4.427 WATER LEVEL GAUGE

4.427.1 There will be an electronic water level gauge provided on the operator's panel that registers water level by means of five (5) colored LED lights. The lights will be durable, ultra-bright five (5) LED design viewable through 180 degrees. The water level indicators will be as follows:

4.427.2 100 percent = Green

4.427.3 75 percent = Yellow

4.427.4 50 percent = Yellow

4.427.5 25 percent = Yellow

4.427.6 Refill = Red

4.427.7 The light will flash when the level drops below the given level indicator to provide an eighth of a tank indication. To further alert the pump operator, the lights will flash sequentially when the water tank is empty.

4.427.8 The level measurement will be based on the sensing of head pressure of the fluid in the tank.

4.427.9 The display will be constructed of a solid plastic material with a chrome plated die cast bezel to reduce vibrations that can cause broken wires and loose electronic components. The encapsulated design will provide complete protection from water and environmental elements. An industrial pressure transducer will be mounted to the outside of the tank. The field calibratable display measures head pressure to accurately show the tank level.

4.427.10 There will be a Hale part number 106877, 4-light driver module included with this installation to power additional water level gauges.

4.427.11 The system(s) will be energized when pump is in gear.

4.428 WATER LEVEL GAUGE

4.428.1 There will be two (2) additional water level indicator(s), Whelen®, Model PSTANK2, LED module with chrome trim, installed one (1) each side rearward of crew cab doors.

4.428.2 This light module(s) will include four (4) colored levels, and function similar to the water level indicator located at the operator's panel:

4.428.3 First green module indicates a full water level.

4.428.4 Second blue module indicates a water level above 3/4 full.

4.428.5 Third amber module indicates a water level above 1/2 full.

4.428.6 Last red module indicates a water level above 1/4 full and empty.

4.428.7 Above 1/4 this light will be steady burning

4.428.8 At empty this light will be flashing

4.428.9 The flash rate will be determined by the main water level tank sensor.

4.428.10 This module will be activated when the parking brake is applied.

4.429 FOAM LEVEL GAUGE

4.429.1 An electronic foam level gauge will be provided on the operator's panel that registers foam level by means of five (5) colored LED lights. The lights will be durable, ultra-bright five (5) LED design viewable through 180 degrees. The foam level indicators will be as follows:

4.429.2 100 percent = Green

4.429.3 75 percent = Yellow

4.429.4 50 percent = Yellow

4.429.5 25 percent = Yellow

4.429.6 Refill = Red

4.429.7 The light will flash when the level drops below the given level indicator to provide an eighth of a tank indication. To further alert the pump operator, the lights will flash sequentially when the foam tank is empty.

4.429.8 The level measurement will be based on the sensing of head pressure of the fluid in the tank.

4.429.9 The display will be constructed of a solid plastic material with a chrome plated die cast bezel to reduce vibrations that can cause broken wires and loose electronic components. The encapsulated design will provide complete protection from foam and environmental elements. An industrial pressure transducer will be mounted to the outside of the tank. The display will be able to be calibrated in the field and will measure head pressure to accurately show the tank level.

4.430 LIGHT SHIELDS

4.430.1 Illumination will be provided at the pump operators control panel for controls, switches, essential instructions, gauges, and instruments necessary for the operation of the apparatus and the equipment provided on it.

4.430.2 There will be one (1) 16-gauge stainless steel light shield installed over the hinged gauge panel.

4.430.3 This light shield will include two (2) Amdor Model XX9951 white 12-volt DC LED 20.00" light strips. The light strips will be activated when the battery switch is on, and the pump panel light switch is on.

4.430.4 This light shield will include one (1) Amdor Model AY-9220-12-C-0 white 12-volt DC LED 11.12" light strip in the center of the shield. This light strip will be activated when the pump is in "ok to pump" mode.

4.430.5 This light shield will include one (1) Code 3 Model XTP3G 3.50" long x 1.25" high x 1.00" deep green 12-volt DC steady burning LED light with chrome trim. This light will be activated when the pump in "ok to pump" mode.

4.430.6 There will be a light activated above the pump panel light switch when the battery switch is on, and the parking brake is set. This is to afford the operator some illumination when first approaching the control panel.

4.430.7 There will be a green pump engaged indicator light activated on at the operator's panel when the pump is shifted into gear from inside the cab.

- 4.431 ADDITIONAL STEP/LIGHT SHIELD** - There will be an additional aluminum treadplate stepping surface no less than 8.00" deep and properly reinforced to support a man's weight, installed over the passenger's side pump panel. There will be 12-volt DC white LED lights installed under the step to illuminate the controls, switches, essential instructions, gauges, and instruments necessary for the operation of the apparatus. These lights will be activated by the pump panel light switch. Additional lights will be included every 18.00" depending on the size of the pump house. There will be one (1) white LED, step light provided above the step. In order to ensure exceptional illumination, each step light will provide a minimum of 25 foot-candles (fc) covering an entire 15.00" x 15.00" square placed 10.00" below the light and a minimum of 1.5 fc covering an entire 30.00" x 30.00" square at the same 10.00" distance below the light. The step light will be activated by the pump panel light switch.
- 4.432 ADDITIONAL STEP/LIGHT SHIELD**
- 4.432.1** There will be an additional aluminum treadplate stepping surface no less than 8.00" deep and properly reinforced to support a man's weight, installed over the driver's side pump panel.
- 4.432.2** There will be 12-volt DC white LED lights installed under the step to illuminate the controls, switches, essential instructions, gauges, and instruments necessary for the operation of the apparatus. These lights will be activated by the pump panel light switch. Additional lights will be included every 18.00" depending on the size of the pump house.
- 4.432.3** There will be one (1) white LED, step light provided above the step. In order to ensure exceptional illumination, each step light will provide a minimum of 25 foot-candles (fc) covering an entire 15" x 15" square placed ten (10) inches below the light and a minimum of 1.5 fc covering an entire 30" x 30" square at the same ten (10) inch distance below the light. The step light will be activated by the pump panel light switch.
- 4.433 AIR HORN SYSTEM** - Two (2) Buell air horns will be recessed in the front bumper. Models 1062 and 1063 shall be provided. The horn system will be piped to the air brake system wet tank utilizing 0.38" tubing. A pressure protection valve will be installed in-line to prevent loss of air in the air brake system.
- 4.434 AIR HORN LOCATION** - The air horns will be located on each side of the bumper, towards the outside.
- 4.435 AIR HORN CONTROL** - The air horns will be actuated by a push button located on officer side instrument panel and by the horn button in the steering wheel. The driver will have the option to control the air horns or the chassis horns from the horn button by means of a selector switch located on the instrument panel.
- 4.436 ELECTRONIC SIREN** - A Whelen®, Model 295SLSA1, electronic siren with noise canceling microphone will be provided. This siren must be active when the battery switch is on, and that emergency master switch is on. Electronic siren head will be recessed in the overhead console above the engine tunnel on the driver side.
- 4.437 SIREN CONTROL** – The electronic siren will be controllable on the siren head and horn ring only. No foot switches will be required. The driver will have the option to control the siren or the chassis horns from the horn button by means of a selector switch located on the instrument panel.
- 4.438 SPEAKERS** - There will be two (2) Whelen, Model SA315P, black nylon composite, 100-watt, speakers with through bumper mounting brackets provided. Each speaker will be connected to the siren amplifier. The speakers will be recessed in each side of the front bumper, just outside of the frame rails.
- 4.439 AUXILIARY MECHANICAL SIREN** – A Federal Q2B® siren will be furnished. The control solenoid will be powered up after the emergency master switch is activated. The mechanical siren will be recessed in the front bumper in the center. The siren will be properly supported using the bumper framework.
- 4.440 MECHANICAL SIREN CONTROL** - The mechanical siren Will be actuated by a push button located on the officer's side instrument panel and by a foot switch on the driver's side. A momentary chrome push button switch will be included in the right-side dash panel to activate the siren brake.
- 4.441 FRONT ZONE UPPER WARNING LIGHTS**

- 4.441.1 There will be (1) traffic light controller and (12) Whelen flashing LED warning lights with chrome trim mounted on a box with removable cover on the cab roof.
- 4.441.2 The lights will be configured per the following:
- 4.441.3 One (1) Model 6RBR with red flashing in a semi-circle pattern LEDs in the driver's side end position.
- 4.441.4 One (1) Model M6J with blue to the rear and red forward flashing LEDs in the driver's side front corner position. The corner position will be at a 45-degree angle to the front of the cab.
- 4.441.5 One (1) Model 6RBR with red flashing in a semi-circle pattern LEDs in the driver's side first front position.
- 4.441.6 One (1) Model 6RBB with blue flashing in a semi-circle pattern LEDs in the driver's side second front position.
- 4.441.7 One (1) Model 6RBR with red flashing in a semi-circle pattern LEDs in the driver's side third front position.
- 4.441.8 One (1) Model M6D with red/white flashing LEDs in the driver's side fourth front position.
- 4.441.9 One (1) 792* Strobe traffic light controller set to national standard high priority in the center position.
- 4.441.10 One (1) Model M6D with red/white flashing LEDs in the passenger's side fourth front position.
- 4.441.11 One (1) Model 6RBR with red flashing in a semi-circle pattern LEDs in the passenger's side third front position.
- 4.441.12 One (1) Model 6RBB with blue flashing in a semi-circle pattern LEDs in the passenger's side second front position.
- 4.441.13 One (1) Model 6RBR with red flashing in a semi-circle pattern LEDs in the passenger's side first front position.
- 4.441.14 One (1) Model M6J with blue to the rear and red forward flashing LEDs in the passenger's side front corner position. The corner position will be at a 45-degree angle to the front of the cab.
- 4.441.15 One (1) Model 6RBR with red flashing in a semi-circle pattern LEDs in the passenger's side end position.

- 4.441.15.1 The color of the lenses will be clear.
- 4.441.15.2 There will be a switch in the cab on the switch panel to control the flashing LEDs.
- 4.441.15.3 The traffic light controller will be activated by a cab switch with emergency master control.
- 4.441.15.4 There will be no momentary switch to activate the traffic light controller.
- 4.441.15.5 The white LEDs will be disabled when the parking brake is applied.
- 4.441.15.6 The flashing LEDs in the front corner, second, third and fifth positions may be load managed when the parking brake is applied.

4.442 CAB FACE WARNING LIGHTS - There will be two (2) Whelen, Model M6*C, LED flashing warning lights with chrome flange provided on the front of the cab above the headlights.

- 4.442.1 The driver's side front warning light must be blue.
- 4.442.2 The passenger's side front warning light must be blue.
- 4.442.3 Both lights will include a clear lens.
- 4.442.4 There will be a switch located in the cab on the switch panel to control the lights.

4.443 FRONT WARNING LIGHT - There will be two (2) Whelen, Model M6*, LED flashing light(s) with chrome trim provided below the headlights as shown on drawing.

- 4.443.1 The color of the light(s) will be red.
- 4.443.2 The color of the lens will be clear.
- 4.443.3 The light(s) will be activated with the front warning switch.
- 4.443.4 These lights may be load managed if colored or disabled if white when the parking brake is applied.
- 4.443.5 Any white light will be disabled, and any amber light activated when the parking brake is applied.

4.444 SIDE ZONE LOWER LIGHTING - There will be six (6) Whelen®, flashing LED warning lights with chrome trim installed per the following:

- 4.444.1 Two (2) Model 6RB**, 4.18" high x 6.56" long x 3.43" deep lights flashing in a semi-circle pattern, one (1) each side on the front cab corner. The side front warning LEDs must be red.

- 4.444.2 Two (2) Model M6**, 4.31" high x 6.75" long x 1.37" deep lights, one (1) each side of cab rearward of crew cab doors. The side middle LEDs must be red.
- 4.444.3 Two (2) Model M6**, 4.31" high x 6.75" long x 1.37" deep lights, one (1) each side on the rear fender panel. The side rear LEDs must be red.
- 4.444.4 The warning light lens color(s) must be clear.
- 4.444.5 There will be a switch in the cab on the switch panel to control the lights.

4.445 INTERIOR CAB DOOR WARNING LIGHTS - There will be four (4) Weldon, Model 8401-0000-20, amber 12-volt DC LED flashing strip lights provided.

- 4.445.1 One (1) light on the driver's side cab door over the window.
- 4.445.2 One (1) light on the passenger's side cab door over the window.
- 4.445.3 One (1) light on the passenger's side crew cab door over the window.
- 4.445.4 One (1) light on the driver's side crew cab door over the window.
- 4.445.5 Each light will be activated when the battery switch is on, and the adjacent door is opened.
- 4.445.6 Each light will be installed so the flash pattern directs traffic away from the doors.

4.446 ADDITIONAL SIDE UPPER LIGHTS - There will be six (6) Whelen, Model M4**, 3.38" high x 5.50" long x 1.38" deep LED surface mount flashing lights with chrome trim provided on the outside corner radius of the cab roof over the crew cab doors.

- 4.446.1 The side front lights must be red.
- 4.446.2 The side middle lights must be blue.
- 4.446.3 The side rear lights must be red.
- 4.446.4 The color of the lenses will be clear.
- 4.446.5 The lights will be installed on two (2) painted bracket that are attached to the cab roof. Three (3) lights on the driver's side and three (3) lights installed on the passenger's side.
- 4.446.6 There will be a switch in the cab on the switch panel to control the lights.
- 4.446.7 White LED's will be disabled when the parking brake is applied. Colored LED's may be load managed when the parking brake is applied.

4.447 SIDE WARNING LIGHTS

- 4.447.1 There will be two (2) Whelen, Model M6*C LED flashing warning light(s) with bezel(s) provided one each side on the forward area centered between top of the hatch and bottom of the compartment. Please match 28165.
- 4.447.2 The color of the lights will be red.
- 4.447.3 All of these lights will include a clear lens.
- 4.447.4 These lights will be activated with the Side Zone Lower warning lights.

4.448 SIDE WARNING LIGHTS

- 4.448.1 There will be two (2) Whelen, Model WIONSMC* LED light(s) provided and located Near the rear body in the rub rail one each side.
- 4.448.2 The color of each light will be red LED with a clear lens.
- 4.448.3 Each light will be provided with a chrome plated ABS flange.
- 4.448.4 The light(s) will be activated with the side warning switch.

4.449 REAR ZONE LOWER LIGHTING

- 4.449.1 There will be two (2) Whelen®, Model M6*C, LED flashing warning lights located at the rear of the apparatus.
- 4.449.2 The driver's side rear light must be red

- 4.449.3 The passenger's side rear light must be red
- 4.449.4 Both lights will include a lens that is clear.
- 4.449.5 There will be a switch located in the cab on the switch panel to control the lights.

4.450 REAR WARNING LIGHTS

- 4.450.1 There will be two (2) Whelen®, Model M6**, 4.31" high x 6.75" wide x 1.37" deep flashing LED warning light(s) with chrome trim provided at the rear of the apparatus, each side high on rear compartment bulkheads.
- 4.450.2 The light(s) to include blue flashing LEDs. The warning light lens color(s) must be clear.
- 4.450.3 These light(s) will be controlled with the rear upper warning switch.
- 4.450.4 The light(s) may be load managed when the parking brake is applied.

4.451 REAR OF HOSE BED WARNING LIGHTS - There will be two (2) Whelen Rota-Beam, Model R316*F, 4.00" high x 7.19" wide beacons with clear domes provided. The rear zone upper lights must be red in color. There will be a switch located in the cab on the switch panel to control the beacons. The rear warning lights will be mounted on top of the compartmentation with all wiring totally enclosed. The rear deck lights will be mounted on the beavertails as high as possible.

4.452 TRAFFIC DIRECTING LIGHT

- 4.452.1 There will be one (1) PowerArc, Model P14PSKR-7Y recessed LED traffic directing light system installed at the rear of the apparatus. The traffic directing light will include seven (7) individual recessed mounted amber LED light heads.
- 4.452.2 A surface mount controller will be included with this installation.
- 4.452.3 The light will be powered up at all times and disabled with the cab in service switch.
- 4.452.4 This traffic directing light will be mounted over the hosebed, between the body side sheets, on a cross tube at the rear of the apparatus. This cross tube is extended up and back at a 45-degree angle so the light will clear the hose bead. There will be a removable access panel on the cross tube for wire access.
- 4.452.5 The traffic directing light control head will be located overhead in the center panel position.
- 4.452.6 A short demonstration and test of the foam system using foam will be provided for City at pick-up.

4.453 LOOSE EQUIPMENT - The following equipment will be furnished with the completed unit: One (1) bag of chrome, stainless steel, or cadmium plated screws, nuts, bolts and washers, as used in the construction of the unit.

4.454 PAINT

- 4.454.1 The exterior custom cab and body painting procedure will consist of a seven (7) step finishing process as follows:
- 4.454.2 Manual Surface Preparation – All exposed metal surfaces on the custom cab and body will be thoroughly cleaned and prepared for painting. Imperfections on the exterior surfaces will be removed and sanded to a smooth finish. Exterior seams will be sealed before painting. Exterior surfaces that will not be painted include chrome plating, polished stainless steel, anodized aluminum and bright aluminum treadplate.
- 4.454.3 Chemical Cleaning and Pretreatment – All surfaces will be chemically cleaned to remove dirt, oil, grease, and metal oxides to ensure the subsequent coatings bond well. The aluminum surfaces will be properly cleaned and treated using a high pressure, high temperature 4 step Acid Etch process. The steel and stainless surfaces will be properly cleaned and treated using a high temperature 3 step process specifically designed for steel or stainless. The chemical treatment converts the metal surface to a passive condition to help prevent corrosion.
- 4.454.4 Surfacer Primer – The Surfacer Primer will be applied to a chemically treated metal surface to provide a strong corrosion protective basecoat. A minimum thickness of 2 mils of Surfacer Primer is applied to surfaces that require a Critical aesthetic finish. The Surfacer Primer is a two-component high solids urethane that has excellent sanding properties and an extra smooth finish when sanded.
- 4.454.5 Finish Sanding – The Surfacer Primer will be sanded with a fine grit abrasive to achieve an ultra-smooth finish. This sanding process is critical to produce the smooth mirror like finish in the topcoat.

- 4.454.6** Sealer Primer – The Sealer Primer is applied prior to the Basecoat in all areas that have not been previously primed with the Surfacer Primer. The Sealer Primer is a two-component high solids urethane that goes on smooth and provides excellent gloss hold out when top coated.
- 4.454.7** Basecoat Paint – Two coats of a high performance, two component high solids polyurethane basecoat will be applied. The Basecoat will be applied to a thickness that will achieve the proper color match. The Basecoat will be used in conjunction with a urethane clear coat to provide protection from the environment.
- 4.454.8** Clear Coat – Two (2) coats of Clear Coat will be applied over the Basecoat color. The Clear Coat is a two-component high solids urethane that provides superior gloss and durability to the exterior surfaces. Lap style and roll-up doors will be Clear Coated to match the body. Paint warranty for the roll-up doors will be provided by the roll-up door manufacturer.
- 4.454.9** After the cab and body are painted, the color will be verified to make sure that it matches the color standard. Electronic color measuring equipment will be used to compare the color sample to the color standard entered into the computer. Color specifications will be used to determine the color match. A Delta E reading will be used to determine a good color match within each family color.
- 4.454.10** All removable items such as brackets, compartment doors, door hinges, and trim will be removed and painted separately if required, to ensure paint behind all mounted items. Body assemblies that cannot be finish painted after assembly will be finish painted before assembly.
- 4.454.11** The paint finish quality levels for critical areas of the apparatus (cab front and sides, body sides and doors, and boom lettering panels) shall meet or exceed Cadillac/General Motors GMW15777 global paint requirements. Orange peel levels shall meet or exceed the #6 A.C.T. standard in critical areas. These requirements must be met in order for the exterior paint finish to be considered acceptable. The manufacturer's written paint standards will be available upon request.

4.455 PAINT - ENVIRONMENTAL IMPACT

- 4.455.1** Vendor will meet or exceed all current state regulations concerning paint operations. Pollution control will include measures to protect the atmosphere, water and soil. Controls will include the following conditions:
- 4.455.2** Topcoats and primers will be chrome and lead free.
- 4.455.3** Metal treatment chemicals will be chrome free. The wastewater generated in the metal treatment process will be treated on-site to remove any other heavy metals.
- 4.455.4** Particulate emission collection from sanding operations will have a 99.99% efficiency factor.
- 4.455.5** Particulate emissions from painting operations will be collected by a dry filter or water wash process. If the dry filter is used, it will have an efficiency rating of 98.00%. Water wash systems will be 99.97% efficient
- 4.455.6** Water from water wash booths will be reused. Solids will be removed on a continual basis to keep the water clean.
- 4.455.7** Paint wastes are disposed of in an environmentally safe manner.
- 4.455.8** Empty metal paint containers will be recycled to recover the metal.
- 4.455.9** Solvents used in clean-up operations will be recycled on-site or sent off-site for distillation and returned for reuse.
- 4.455.10** Additionally, the finished apparatus will not be manufactured with or contain products that have ozone depleting substances. Vendor will, upon demand, present evidence that the manufacturing facility meets the above conditions and that it is in compliance with his state EPA rules and regulations.

4.456 CAB TWO-TONE PAINT - The cab will be painted two-tone, with the upper section painted #10 white and the lower section painted #90 red. There will be a standard two-tone cab paint break provided. There will be a standard cab shield provided.

4.457 BODY PAINT - The body will be painted to match the lower section of the cab.

4.458 PAINT CHASSIS FRAME ASSEMBLY- The chassis frame assembly will be finished with primer and gloss paint to match the lower job color before the installation of the cab and body, and before installation of the engine and transmission assembly, air brake lines, electrical wire harnesses, etc.

4.458.1 Components that are included with the chassis frame assembly that will be painted are:

4.458.2 Frame rails

- 4.458.3 Frame liners
- 4.458.4 Cross members
- 4.458.5 Axles
- 4.458.6 Suspensions
- 4.458.7 Steering gear
- 4.458.8 Battery boxes
- 4.458.9 Bumper extension weldment
- 4.458.10 Frame extensions
- 4.458.11 Body mounting angles
- 4.458.12 Rear Body support substructure (front and rear)
- 4.458.13 Pump house substructure
- 4.458.14 Air tanks
- 4.458.15 Steel fuel tank
- 4.458.16 Castings
- 4.458.17 Individual piece parts used in chassis and body assembly
- 4.458.18 Components treated with epoxy E-coat protection prior to paint:
- 4.458.19 Two (2) C-channel frame rails
- 4.458.20 Two (2) frame liners
- 4.458.21 The E-coat process will meet the technical properties shown.

4.459 **PAINT, FRONT WHEELS** - All wheel surfaces, inside and outside, will be provided with powder coat paint #90 red.

4.460 **PAINT, REAR WHEELS** - All wheel surfaces, inside and outside, will be provided with powder coat paint #90 red.

4.461 **AXLE HUB PAINT** - All axle hubs will be painted to match lower job color.

4.462 **FUEL TANK LABEL** - The manufacturer's label on the fuel tank will be taped off so that it does not get painted.

4.463 **COMPARTMENT INTERIOR PAINT** - The interior of all compartments will be painted with a gray spatter finish for ease of cleaning and to make it easier to touch up scratches and nicks.

4.464 **REFLECTIVE STRIPES** - Three (3) reflective stripes will be provided across the front of the vehicle and along the sides of the body. The reflective band will consist of a 1.00" white stripe at the top with a 1.00" gap then a 6.00" white stripe with a 1.00" gap and a 1.00" white stripe on the bottom.

4.465 **CHEVRON STRIPING ON THE FRONT BUMPER**

4.465.1 There will be alternating chevron striping located on the front bumper.

4.465.2 The colors will be red and fluorescent yellow green diamond grade.

4.465.3 The size of the striping will be 6.00".

4.465.4 **REAR CHEVRON STRIPING**

4.465.5 There will be alternating chevron striping located on the rear-facing vertical surface of the apparatus. The rear surface, excluding the rear compartment door, will be covered.

4.465.6 The colors will be red and fluorescent yellow green diamond grade.

4.465.7 Each stripe will be 6.00" in width.

4.465.8 This will meet the requirements of the current edition of NFPA 1901, which states that 50% of the rear surface will be covered with chevron striping.

4.466 **CHEVRON STRIPING ON CAB AND CREW CAB DOOR EDGE** - There will be alternating chevron striping located on the inside of each cab and crew cab door edge. The design will be either DOT pattern or standard chevron design. Width will be determined by available space. The striping will consist of the following colors:

4.466.1 The first color will be red diamond grade

4.466.2 The second color will be fluorescent yellow green diamond grade.

- 4.467 INVERTED "V" CHEVRON STRIPING ON CAB AND CREW CAB DOORS** - There will be alternating chevron striping located on the inside of each cab and crew cab door. The striping will consist of the following colors:
- 4.467.1** The first color will be fluorescent yellow green diamond grade.
 - 4.467.2** The second color will be red diamond grade.
 - 4.467.3** The size of the striping will be 4.00".
- 4.468 STRIPE, CAB FACE** - A black vinyl stripe will be provided on the paint break.
- 4.469 LETTERING** - There will be reflective lettering, 3.00" high, with outline provided. There will be 27 letters provided.
- 4.470 SIGN PANELS** - A pair of sign panels 2.75" x 8.0" will be fabricated from brushed aluminum sheet and installed on the sides of the pumphouse immediately below the blue LED pump overheat lights, one on each side. 1.0" high red reflective lettering will be applied to each panel to spell out "PUMP" on the top line and "OVERHEAT" on the bottom line.
- 4.471 LETTERING** - There will be reflective lettering, 2.00" high, with outline provided. There will be 18 letters provided.
- 4.472 LETTERING** - Eighty-one (81) to one hundred (100) printed effect gold leaf lettering, 2.00" high, with outline will be provided.
- 4.473 LETTERING** - Eighty-one (81) to one hundred (100) printed effect gold leaf lettering, 1.00" high, with outline will be provided.
- 4.474 LETTERING** - There will be reflective lettering, 4.00" high, with outline provided. There will be ten (10) letters provided.
- 4.475 LETTERING** - There will be reflective lettering, 20.00" high, with no outline or shade provided. There will be four (4) letters provided.
- 4.476 LETTERING** - One (1) to twenty (20) reflective lettering, 9.00" high, with outline will be provided.
- 4.477 LETTERING** - There will be reflective lettering, 24.00" high, with no outline or shade provided. There will be three (3) letters provided.
- 4.478 LETTERING** - There will be reflective lettering, 6.00" high, with outline provided. There will be three (3) letters provided.
- 4.479 LETTERING** - There will be reflective lettering, 5.00" high, with outline provided. There will be six (6) letters provided.
- 4.480 LETTERING** - Twenty-one (21) to forty (40) printed effect gold leaf lettering, 6.00" high, with outline will be provided.
- 4.481 EMBLEMS** - There will be a pair of Texas flag emblem/s, installed crew cab doors- non waving. The flag will be waving design and made out of Gerber Vision material.
- 4.482 EMBLEM** - There will be one (1) reflective emblem(s), approximately 16.00" - 18.00" in size, installed r-1 door. the emblem will be modeled after the department submitted information (art, patch, etc).
- 4.483 FIRE APPARATUS PARTS MANUAL** - There will be one (1) custom parts manual(s) in USB flash drive format for the complete fire apparatus provided. The manual(s) will contain the following:
- 4.483.1** Job number
 - 4.483.2** Part numbers with full descriptions
 - 4.483.3** Table of contents
 - 4.483.4** Parts section sorted in functional groups reflecting a major system, component, or assembly
 - 4.483.5** Parts section sorted in alphabetical order
 - 4.483.6** Instructions on how to locate parts

4.483.7 Each manual will be specifically written for the chassis and body model being purchased. It will not be a generic manual for a multitude of different chassis and bodies.

4.484 SERVICE PARTS INTERNET SITE - The service parts information included in these manuals are also available on the Pierce website. The website offers additional functions and features not contained in this manual, such as digital photographs and line drawings of select items. The website also features electronic search tools to assist in locating parts quickly.

4.485 CHASSIS SERVICE CD/USB DRIVE MANUALS - There will be two (2) CD or USB DRIVE format chassis service manuals containing parts and service information on major components provided with the completed unit. The manual will contain the following sections:

4.485.1 Job number

4.485.2 Table of contents

4.485.3 Troubleshooting

4.485.4 Front Axle/Suspension

4.485.5 Brakes

4.485.6 Engine/Tires

4.485.7 Wheels

4.485.8 Cab

4.485.9 Electrical, DC

4.485.10 Air Systems

4.485.11 Plumbing

4.485.12 Appendix

4.485.13 The manual will be specifically written for the chassis model being purchased. It will not be a generic manual for a multitude of different chassis and bodies.

4.486 CHASSIS OPERATION MANUAL - The chassis operation manual will be provided on two (2) USB flash drives.

4.487 WARRANTY: All items bid must include the maximum standard manufacturer's warranty available, including both parts and labor, for all components and attachments. All warranties must be for a minimum period of twelve months. The warranty shall begin on the date the vehicle is placed in service, not on the delivery date. Vendor shall attach a copy of the manufacturer's warranty to Vendor's bid. City will notify Vendor by letter of the in-service date for each item by serial number. Warranty service and parts must be available within a 50-mile radius of San Antonio City Hall from a factory authorized dealer. Included warranties are as follows:

4.488 ONE (1) YEAR MATERIAL AND WORKMANSHIP ON APPARATUS

4.489 THREE (3) YEAR MATERIAL AND WORKMANSHIP ON CHASSIS

4.490 FIVE (5) YEAR LIMITED ENGINE WARRANTY

4.491 THREE (3) YEAR STEERING GEAR WARRANTY

4.492 FIFTY (50) YEAR STRUCTURAL INTEGRITY ON FRAME AND CROSS MEMBERS

4.493 FRONT AXLE THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY

4.494 REAR AXLE FIVE (5) YEAR MATERIAL AND WORKMANSHIP WARRANTY

4.495 ABS BRAKE SYSTEM THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY

4.496 TEN (10) YEAR CUSTOM CAB LIMITED STRUCTURAL INTEGRITY

4.497 TEN (10) YEAR PRO-RATED PAINT AND CORROSION

4.498 FIVE (5) YEAR MATERIAL AND WORKMANSHIP PIERCE COMMAND ZONE ELECTRONICS LIMITED WARRANTY CERTIFICATE

4.499 FIFTY-FOUR MONTH WARRANTY CAMERA SYSTEM WARRANTY

4.500 FIVE (5) YEAR/UNLIMITED TRANSMISSION WARRANTY EXCLUDING TRANSMISSION COOLER COVERED BY PART MANUFACTURER. - Collateral damage warranty will also be in effect for the first three (3) years of the warranty coverage and will not exceed \$10,000 per occurrence. A copy of the warranty certificate will be submitted with the bid package.

4.501 TEN (10) YEAR STRUCTURAL INTEGRITY ON APPARATUS BODY

- 4.502 ROLL UP DOOR MATERIAL AND WORKMANSHIP WARRANTY - A six (6) year limited warranty will be provided on painted and satin roll up doors.**
- 4.503 TWENTY (20) YEAR AERIAL DEVICE STRUCTURAL INTEGRITY WARRANTY**
- 4.504 FIVE (5) YEAR HYDRAULIC SYSTEM COMPONENTS WARRANTY**
- 4.505 THREE (3) YEAR HYDRAULIC SEAL WARRANTY**
- 4.506 TEN (10) YEAR PRO-RATED PAINT AND CORROSION ON TRUCK BODY**
- 4.507 ONE (1) YEAR MATERIAL AND WORKMANSHIP ON GRAPHICS FADING AND DETERIORATION.**
- 4.508 SINGLE REAR AXLE FIVE (5) YEAR MATERIAL AND WORKMANSHIP WARRANTY - A Meritor™ Axle 5-year limited warranty will be provided.**
- 4.509 WATER TANK WARRANTY - A UPF poly water tank limited warranty certificate, WA0195, is included with this proposal.**
- 4.509.1 PUMP WARRANTY –** The Waterous pump will be provided with a Seven (7) year material and workmanship limited warranty. A copy of the warranty certificate will be submitted with the bid package (no exception).
- 4.509.2 TEN (10) YEAR PUMP PLUMBING WARRANTY –** The Pierce apparatus plumbing limited warranty certificate, WA0035, is included.
- 4.510 TWO (2) YEAR EXTENDED -**The Pierce body limited warranty certificate, WA0096, is included.
- 4.511 VEHICLE STABILITY CERTIFICATION -** The fire apparatus manufacturer will provide a certification stating the apparatus complies with NFPA 1901, current edition, section 4.13, Vehicle Stability. Vendor will provide the certification at the time of bid.
- 4.512 ENGINE INSTALLATION CERTIFICATION -** The fire apparatus manufacturer will provide a certification, along with a letter from the engine manufacturer stating they approve of the engine installation in the bidder's chassis. Vendor will provide the certification at the time of bid.
- 4.513 POWER STEERING CERTIFICATION -** The fire apparatus manufacturer will provide a certification stating the power steering system as installed meets the requirements of the component supplier. Vendor will provide the certification at the time of bid.
- 4.514 CAB INTEGRITY CERTIFICATION -** The fire apparatus manufacturer will provide a cab integrity certification with this proposal. The certification will state that the cab has been tested and certified by an independent third-party test facility. Testing events will be documented with photographs, real-time and high-speed video, vehicle accelerometers, cart accelerometers, and a laser speed trap. The fire apparatus manufacturer will provide a state-licensed professional engineer to witness and certify all testing events. Testing will meet or exceed the requirements below:
- 4.514.1** European Occupant Protection Standard ECE Regulation No.29.
- 4.514.2** SAE J2422 Cab Roof Strength Evaluation - Quasi-Static Loading Heavy Trucks.
- 4.514.3** SAE J2420 COE Frontal Strength Evaluation - Dynamic Loading Heavy Trucks.
- 4.515 ROOF CRUSH -** The cab will be subjected to a roof crush force of 22,050 lb. This value meets the ECE 29 criteria and is equivalent to the front axle rating up to a maximum of 10 metric tons.
- 4.516 ADDITIONAL ROOF CRUSH -** The same cab will be subjected to a roof crush force of 100,000 lbs. This value exceeds the ECE 29 criteria by nearly 4.5 times.
- 4.517 SIDE IMPACT -** The same cab will be subjected to dynamic preload where a 13,275 lb moving barrier slams into the side of the cab at 5.5 mph at a force of 13,000 ft-lbs. This test is part of the SAE J2422 test procedure and more closely represents the forces a cab will see in a rollover incident.
- 4.518 FRONTAL IMPACT -** The same cab will withstand a frontal impact of 32,600 ft-lbs of force using a moving barrier in accordance with SAE J2420.

- 4.519 ADDITIONAL FRONTAL IMPACT** - The same cab will withstand a frontal impact of 65,200 ft-lbs of force using a moving barrier, (twice the force required by SAE J2420). The same cab will withstand all tests without any measurable intrusion into the survival space of the occupant area.
- 4.520 CAB DOOR DURABILITY CERTIFICATION** - Robust cab doors help protect occupants. Cab doors will survive a 200,000-cycle door slam test where the slamming force exceeds 20 G's of deceleration. Vendor will certify that the sample doors similar to those provided on the apparatus have been tested and have met these criteria without structural damage, latch malfunction, or significant component wear.
- 4.521 WINDSHIELD WIPER DURABILITY CERTIFICATION** - Visibility during inclement weather is essential to safe apparatus performance. Windshield wipers will survive a 3 million cycle durability test in accordance with section 6.2 of SAE J198 Windshield Wiper Systems - Trucks, Buses and Multipurpose Vehicles. Vendor will certify that the wiper system design has been tested and that the wiper system has met these criteria.
- 4.522 ELECTRIC WINDOW DURABILITY CERTIFICATION** - Cab window roll-up systems can cause maintenance problems if not designed for long service life. The window regulator design will complete 30,000 complete up-down cycles and still function normally when finished. Vendor will certify that sample doors and windows similar to those provided on the apparatus have been tested and have met these criteria without malfunction or significant component wear.
- 4.523 SEAT BELT ANCHOR STRENGTH** - Seat belt attachment strength is regulated by Federal Motor Vehicle Safety Standards and must be validated through testing. Each seat belt anchor design will withstand 3000 lb of pull on both the lap and shoulder belt in accordance with FMVSS 571.210 Seat Belt Assembly Anchorages. Vendor will certify that each anchor design was pull tested to the required force and met the appropriate criteria.
- 4.524 SEAT MOUNTING STRENGTH** - Seat attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat mounting design will be tested to withstand 20 Gs of force in accordance with FMVSS 571.207 Seating Systems. Vendor will certify that each seat mount and cab structure design was pull tested to the required force and met the appropriate criteria.
- 4.525 PERFORMANCE CERTIFICATIONS**
- 4.525.1 Cab Air Conditioning** - Good cab air conditioning temperature and air flow performance keeps occupants comfortable, reduces humidity, and provides a climate for recuperation while at the scene. The cab air conditioning system will cool the cab from a heat-soaked condition at 100 degrees Fahrenheit to an average of 78 degrees Fahrenheit in 30 minutes. Vendor will certify that a substantially similar cab has been tested and has met these criteria.
- 4.525.2 Cab Defroster** - Visibility during inclement weather is essential to safe apparatus performance. The defroster system will clear the required windshield zones in accordance with SAE J381 Windshield Defrosting Systems Test Procedure And Performance Requirements - Trucks, Buses, And Multipurpose Vehicles. Vendor will certify that the defrost system design has been tested in a cold chamber and passes the SAE J381 criteria.
- 4.525.3 Cab Auxiliary Heater** - An auxiliary cab heater will warm the cab 77 degrees Fahrenheit from a cold-soak, within 30 minutes when tested using the coolant supply methods found in SAE J381. Vendor will certify, at time of delivery, that a substantially similar cab has been tested and has met these criteria.
- 4.526 AMP DRAW REPORT –**
- 4.526.1** Vendor will provide, at the time of bid and delivery, an itemized print out of the expected amp draw of the entire vehicle's electrical system.
- 4.526.2** Vendor will ensure the manufacturer of the apparatus provides the following to the City:

- 4.526.2.1** Documentation of the electrical system performance tests.
- 4.526.2.2** A written load analysis, which will include the following:
- 4.526.2.3** The nameplate rating of the alternator.
- 4.526.2.4** The alternator rating under the conditions specified per:
- 4.526.2.5** Applicable NFPA 1901 or 1906 (Current Edition).
- 4.526.2.6** The minimum continuous load of each component that is specified per:
- 4.526.2.7** Applicable NFPA 1901 or 1906 (Current Edition).
- 4.526.2.8** Additional loads that, when added to the minimum continuous load, determine the total connected load.
- 4.526.2.9** Each individual intermittent load.
- 4.526.2.10** All of the above listed items will be provided by vendor per the applicable NFPA 1901 or 1906 (Current Edition).

005 - SUPPLEMENTAL TERMS & CONDITIONS

Original Contract Term.

This contract shall begin upon the effective date of the ordinance awarding the contract, or date specified in the award letter if this contract does not exceed \$50,000.00. This contract shall terminate upon completion of all work described herein or delivery of all goods ordered, as applicable.

Cooperative Contract Provisions.

Term Consistent with Cooperative Contract. Notwithstanding anything to the contrary herein, no new orders may be placed hereunder after the expiration or termination of the underlying cooperative contract. Renewals cannot extend beyond the term of the underlying cooperative contract. Extensions cannot extend beyond the term of the underlying cooperative contract.

Contract Documents. The terms and conditions for performance and payment of compensation for this contract are set forth in the following contract documents, true and correct copies of which are attached hereto and fully incorporated herein for all purposes:

This Request for Offer, including any attachments identified herein and addenda issued by City prior to acceptance of an offer from Offeror;

Any Purchase Orders Issued hereunder by City of San Antonio ("City"); and

Exhibit I – All applicable terms and conditions of the Cooperative Purchasing Contract number FS12-23 through the HGAC Cooperative Purchasing.

Order of Priority of Contract Documents. Should a conflict arise among the provisions of the contract documents, this RFO and any Purchase Order issued hereunder shall govern over Exhibit I, unless otherwise specifically provided herein.

This RFO includes the following: Instructions to Offerors, General Terms and Conditions, Supplemental Terms and Conditions, Product Specifications and Description of Services, Definitions, Price Schedule, any Attachments identified herein.

Warranty.

The warranty specified in Exhibit I, if any, a minimum of 90-days product guarantee or the manufacturer's standard commercial warranty, whichever is greater, shall apply to all products and/or services purchased under this RFO, unless otherwise specified in the Specifications/Scope of Services section of this RFO. This warranty shall provide for replacement of defective merchandise, parts, and labor, and shall include pick-up of the defective merchandise from City and delivery of the replacement(s) to the same location. The warranty shall be effective from the date of acceptance of the merchandise, or completion of the service, as applicable.

Rejection of Disclaimers of Warranties & Limitations Of Liability.

ANY TERM OR CONDITION IN EXHIBIT I, OR IN ANY DOCUMENT FURNISHED BY VENDOR, DISCLAIMING THE IMPLIED WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE, OR ATTEMPTING TO LIMIT VENDOR'S LIABILITY SHALL BE OF NO FORCE OR EFFECT, AND SHALL BE STRICKEN FROM THE CONTRACT DOCUMENTS AS IF NEVER CONTAINED THEREIN.

Insurance.

Prior to the commencement of the purchase and delivery of unit under this Agreement, CONTRACTOR must provide a completed Certificate(s) of Insurance to CITY'S San Antonio Fire Department. The certificate must be:

- clearly labeled with the name of the contract in the Description of Operations block;
- completed by an agent and signed by a person authorized by the insurer to bind coverage on its behalf (CITY will not accept Memorandum of Insurance or Binders as proof of insurance); and
- properly endorsed and have the agent's signature, and phone number.

Certificates may be mailed or sent via email, directly from the insurer's authorized representative. CITY shall have no duty to pay or perform under this Agreement until such certificate and endorsements have been received and approved by CITY'S San Antonio Fire Department. No officer or employee, other than CITY'S Risk Manager, shall have authority to waive this requirement.

If the City does not receive copies of insurance endorsement, then by executing this Agreement, CONTRACTOR certifies and represents that its endorsements do not materially alter or diminish the insurance coverage for this contract.

The City's Risk Manager reserves the right to modify the insurance coverages, their limits, and deductibles prior to the scheduled event or during the effective period of this Agreement based on changes in statutory law, court decisions, and changes in the insurance market which presents an increased risk exposure.

CONTRACTOR shall obtain and maintain in full force and effect for the duration of this Agreement, at CONTRACTOR'S sole expense, insurance coverage written on an occurrence basis, by companies authorized and admitted to do business in the State of Texas and with an A.M. Best's rating of no less than A- (VII), in the following types and for an amount not less than the amount listed below. If the CONTRACTOR claims to be self-insured, they must provide a copy of their declaration page so the CITY can review their deductibles:

TYPE	AMOUNTS
1. Workers' Compensation	Statutory
2. Employers' Liability	\$1,000,000/\$1,000,000/\$1,000,000
3. Commercial General Liability Insurance to include coverage for the following: a. Premises/Operations b. Products/Completed Operations c. Personal/Advertising Injury d. Independent Contractors*	For Bodily Injury and Property Damage of \$1,000,000 per occurrence; \$2,000,000 General Aggregate, or its equivalent in Umbrella Liability Coverage
4. Business Automobile Liability a. Owned/leased vehicles b. Non-owned vehicles c. Hired Vehicles	Combined Single Limit for Bodily Injury and Property Damage of \$1,000,000 per occurrence
5. Products liability	\$1,000,000 per occurrence; \$2,000,000 general aggregate, or its equivalent in Umbrella Liability Coverage.
*If Applicable	

CONTRACTOR must require, by written contract, that all subcontractors providing goods or services under this Agreement obtain the same insurance coverages required of CONTRACTOR and provide a certificate of insurance and endorsement that names CONTRACTOR and CITY as additional insureds. CONTRACTOR shall provide CITY with subcontractor certificates and endorsements before the subcontractor starts work.

If a loss results in litigation, then the CITY is entitled, upon request and without expense to the City, to receive copies of the policies, declaration page and all endorsements. CONTRACTOR must comply with such requests within 10 days by submitting the requested insurance documents to the CITY at the following address:

City of San Antonio
Attn: San Antonio Fire Department
P.O. Box 839966
San Antonio, Texas 78283-3966

CONTRACTOR's insurance policies must contain or be endorsed to contain the following provisions:

- Name CITY and its officers, officials, employees, volunteers, and elected representatives as additional insureds by endorsement, as respects operations and activities of, or on behalf of, the named insured performed under contract with CITY. The endorsement requirement is not applicable for workers' compensation and professional liability policies.
- Endorsement that the "other insurance" clause shall not apply to CITY where CITY is an additional insured shown on the policy. CITY's insurance is not applicable in the event of a claim.
- Contractor shall submit a waiver of subrogation to include, workers' compensation, employers' liability, general liability and auto liability policies in favor of CITY; and

- Provide 30 days advance written notice directly to CITY of any suspension, cancellation, non-renewal or materials change in coverage, and not less than ten (10) calendar days advance written notice for nonpayment of premium.

Within five (5) calendar days of a suspension, cancellation, material change in coverage, or non-renewal of coverage, CONTRACTOR shall provide a replacement Certificate of Insurance and applicable endorsements to CITY. CITY shall have the option to suspend CONTRACTOR'S performance should there be a lapse in coverage at any time during this Agreement. Failure to provide and to maintain the required insurance shall constitute a material breach of this Agreement.

In addition to any other remedies CITY may have upon CONTRACTOR'S failure to provide and maintain any insurance or policy endorsements to the extent and within the time required, CITY may order CONTRACTOR to stop work and/or withhold any payment(s) which become due to CONTRACTOR under this Agreement until CONTRACTOR demonstrates compliance with requirements.

Nothing contained in this Agreement shall be construed as limiting the extent to which CONTRACTOR may be held responsible for payments of damages to persons or property resulting from CONTRACTOR'S or its subcontractors' performance of the work covered under this Agreement.

CONTRACTOR'S insurance shall be deemed primary and non-contributory with respect to any insurance or self - insurance carried by City for liability arising out of operations under this Agreement.

The insurance required is in addition to and separate from any other obligation contained in this Agreement and no claim or action by or on behalf of City shall be limited to insurance coverage provided.

CONTRACTOR and any subcontractor are responsible for all damage to their own equipment and/or property result from their own negligence.

Incorporation of Attachments.

Each of the attachments listed below is an essential part of this contract, which governs the rights and duties of the parties, incorporated herein by reference, and shall be interpreted in the order of priority as appears below, with this document taking priority over all attachments:

- Attachment A – Price Schedule
- Attachment B – City of San Antonio Local Preference Program Tracking Form
- Attachment C – Veteran-Owned Small Business Preference Program Tracking Form
- Attachment D – Certificate of Interested Parties (Form 1295)
- Attachment E – Working with COSA
- Exhibit I – HGAC FS12-23

006 - GENERAL TERMS & CONDITIONS

Electronic Offer Equals Original. If Vendor is submitting an electronic offer, City and Vendor each agree that this transaction may be conducted by electronic means, as authorized by Chapter 322, Texas Business & Commerce Code, known as the Electronic Transactions Act.

Delivery of Goods/Services.

Destination Contract. Vendor shall deliver all goods and materials F.O.B., City of San Antonio's designated facility, inside delivery, freight prepaid, to the address provided in this RFO or, if different, in the Purchase Order. Vendor shall bear the risk of loss until delivery. Freight charges will be paid only when expedited delivery is requested and approved in writing by City. Vendor shall be responsible for furnishing necessary personnel or equipment and/or making necessary arrangements to off load at City of San Antonio facility, unless otherwise noted herein.

Failure to Deliver. When delivery is not met as provided for in the contract, City may make the purchase on the open market, with any cost in excess of the contract price paid by Vendor, in addition to any other direct, indirect, consequential or incidental damages incurred by City as a result thereof. In addition, Vendor may be removed from City's list of eligible bidders.

Purchase Orders. Each time a City department wishes to place an order against this contract, it will issue Vendor a purchase order. Vendor must have the purchase order before making any delivery.

Acceptance by City. City shall have a reasonable time (but not less than 30 days) after receipt to inspect the goods and services tendered by Vendor. City at its option may reject all or any portion of such goods or services which do not, in City's sole discretion, comply in every respect with all terms and conditions of the contract. City may elect to reject the entire goods and services tendered even if only a portion thereof is nonconforming. If City elects to accept nonconforming goods and services, City, in addition to its other remedies, shall be entitled to deduct a reasonable amount from the price thereof to compensate City for the nonconformity. Any acceptance by City, even if non-conditional, shall not be deemed a waiver or settlement of any defect in such goods and services.

Testing. After award of contract, City may, at its sole option, test the product delivered to ensure it meets specifications. Initial testing shall be at City's expense. However, if the product does not meet specifications, Vendor shall reimburse City for the costs of testing. City may withhold the cost of testing from any amounts owed to Vendor under this or any other contract, or invoice Vendor for same. If invoiced, Vendor shall pay City within 30 calendar days' of the invoice.

Invoicing and Payment.

Invoice Submissions. City requires all original first time invoices to be submitted directly to the Accounts Payable section of the Finance Department. The preferred method of delivery is electronically to the following e-mail address:

accounts.payable@sanantonio.gov

Invoices submitted electronically to the e-mail address above must be in separate .pdf format file. Multiple invoices cannot be submitted in a single .pdf file; however, Vendor may submit multiple, separate invoice files in a single e-mail. Any required documentation in support of the invoice should be compiled directly behind the invoice in the same .pdf file. Each electronically submitted file must have a unique identifying name that is not the same as any other file name.

Invoices submitted by electronic submission are only considered "original" when the submission comes directly from the Vendor to Accounts Payable using this e-mail address. Vendor may courtesy copy the ordering City department personnel on the e-mail.

Vendors not able to submit invoices with the required file formatting above may mail original invoices, on white paper only, to: City of San Antonio, Attn: Accounts Payable, P.O. Box 839976, San Antonio, Texas 78283-3976.

Information Required On Invoice.

All invoices must be in a form and content approved by the City. City may require modification of invoices if necessary in order to satisfy City that all billing is proper and pursuant to the terms of the contract. Invoices are required to show each City Purchase Order Number. Invoices must be legible. Items billed on invoices must be specific as to applicable stock, manufacturer, catalog or part number (if any). All invoices must show unit prices for each item being billed, the quantity of items being billed and the total for each item, as well as the total for all items on the invoice. If prices are based on list prices basis, then the list prices, the percentage discount or percentage surcharge, net unit prices, extensions and net total prices must be shown. Prompt payment discounts offered shall be shown separately on the invoice.

Payment by City.

In accordance with the Texas Prompt Payment Act, City shall have not less than 30 days to pay for goods or services. Time for payment, including payment under discount terms, will be computed from the later of: (1) the date City receives conforming goods under the contract; (2) the date performance of the service under the contract is completed; or (3) the date City receives a correct and valid invoice for the goods or services. Payment is deemed to be made on the date of mailing of the check. Payment is made in US dollars only.

This provision shall not apply where there is a bona fide dispute between City and Vendor about the goods delivered or the service performed that causes the payment to be late, or where the invoice is not mailed to the address provided herein.

The payment amount due on invoices may not be manually altered by City personnel. Once disputed items are reconciled, Vendor must submit a corrected invoice or a credit memorandum for the disputed amount.

NECESSITY OF TIMELY INVOICE / WAIVER OF PAYMENT. NOTWITHSTANDING THE FORGOING, CITY CANNOT PAY FOR ANY GOODS OR SERVICES WITHOUT AN INVOICE. VENDOR MUST INVOICE CITY NO LATER THAN 90 CALENDAR DAYS FROM THE DATE GOODS ARE DELIVERED OR SERVICES RENDERED. FAILURE TO SUBMIT AN INVOICE WITHIN SAID 90 DAY SHALL NEGATE ANY LIABILITY ON THE PART OF CITY AND CONSTITUTE A **WAIVER** BY VENDOR OF ANY AND ALL RIGHT OR CLAIMS TO COLLECT MONEYS THAT VENDOR MAY RIGHTFULLY BE OTHERWISE ENTITLED TO FOR GOODS OR SERVICES PERFORMED.

The total price for all goods and/or services is shown on the Price Schedule. No additional fees or expenses of Vendor shall be charged by Vendor nor be payable by City. The parties hereby agree that all compensable expenses of Vendor are shown on the Price Schedule. If there is a discrepancy on the Price Schedule between the unit price for an item, and the extended price, the unit price shall govern.

Amendments. Except where the terms of this contract expressly provide otherwise, any alterations, additions, or deletions to the terms hereof, shall be effected by amendment, in writing, executed by both City and Vendor. The Director of the Purchasing and General Services Department, or Director's designee, shall have authority to execute amendments on behalf of City without further action by the San Antonio City Council, subject to and contingent upon appropriation of funds for any increase in expenditures by City.

Termination.

Termination-Breach. Should vendor fail to fulfill in a timely and proper manner, as determined solely by the Director, its material obligations under this contract, or violate any of the material terms of this contract, City shall have the right to immediately terminate the contract in whole or in part. Notice of termination shall be provided in writing to the Vendor, effective upon the date set forth in the notice. City may, in City's sole discretion, provide an opportunity for Vendor to cure the default. If City elects to offer an opportunity to cure, City shall provide notice to Vendor specifying the matters in default and the cure period. If Vendor fails to cure the default within the cure period, City shall have the right, without further notice, to terminate the contract in whole or in part. Such termination shall not relieve Vendor of any liability to the City for damages sustained by virtue of any breach by Vendor.

Termination-Notice. City may terminate this contract, in whole or in part, without cause. City shall be required to give Vendor notice ten days prior to the date of termination of the contract without cause.

Termination-Funding. City retains the right to terminate this contract at the expiration of each of City's budget periods. This contract is conditioned on a best efforts attempt by City to obtain and appropriate funds for payment of any debt due by City herein.

Termination by City may be effected by Director, without further action by the San Antonio City Council.

Independent Contractor. Vendor covenants and agrees that it is an independent contractor and not an officer, agent, servant or employee of City. City shall not be liable for any claims which may be asserted by any third party occurring in connection with the services to be performed by Vendor under this contract and that Vendor has no authority to bind City. The doctrine of respondeat superior shall not apply as between City and Vendor.

INDEMNIFICATION.

VENDOR covenants and agrees to FULLY INDEMNIFY, DEFEND and HOLD HARMLESS, CITY and the elected officials, employees, officers, directors, volunteers and representatives of CITY, individually and collectively, from and against any and all costs, claims, liens, damages, losses, expenses, fees, fines, penalties, proceedings, actions, demands, causes of action, liability and suits of any kind and nature, including but not limited to, personal or bodily injury, death and property damage, made upon CITY directly or indirectly arising out of, resulting from or related to VENDOR'S activities under this Agreement, including any acts or omissions of VENDOR, any agent, officer, director, representative, employee, consultant or subcontractor of VENDOR, and their respective officers, agents employees, directors and representatives while in the exercise of the rights or performance of the duties under this Agreement. The indemnity provided for in this paragraph shall not apply to any liability resulting from the negligence of CITY, its officers or employees, in instances where such negligence causes personal injury, death, or property damage. IN THE EVENT VENDOR AND CITY ARE FOUND JOINTLY LIABLE BY A COURT OF COMPETENT JURISDICTION, LIABILITY SHALL BE APPORTIONED COMPARATIVELY IN ACCORDANCE WITH THE LAWS FOR THE STATE OF TEXAS, WITHOUT, HOWEVER, WAIVING ANY GOVERNMENTAL IMMUNITY AVAILABLE TO CITY UNDER TEXAS LAW AND WITHOUT WAIVING ANY DEFENSES OF THE PARTIES UNDER TEXAS LAW. In addition, Vendor agrees to indemnify, defend, and hold City harmless from any claim involving patent infringement, trademarks, trade secrets, and copyrights on goods supplied.

The provisions of this INDEMNITY are solely for the benefit of the parties hereto and not intended to create or grant any rights, contractual or otherwise, to any other person or entity. VENDOR shall advise CITY in writing within 24 hours of any claim or demand against CITY or VENDOR known to VENDOR related to or arising out of VENDOR's activities under this AGREEMENT and shall see to the investigation and defense of such claim or demand at VENDOR's cost. CITY shall have the right, at its option and at its own expense, to participate in such defense without relieving VENDOR of any of its obligations under this paragraph.

Assignment. Except as otherwise stated herein, Vendor may not sell, assign, pledge, transfer or convey any interest in this contract, nor delegate the performance of any duties hereunder, by transfer, by subcontracting or any other means, without the consent of Director. As a condition of such consent, if such consent is granted, Vendor shall remain liable for completion of the services and provision of goods outlined in this contract in the event of default by the successor vendor, assignee, transferee or subcontractor. Any attempt to transfer, pledge or otherwise assign this Contract without said written approval, shall be void ab initio and shall confer no rights upon any third person.

Ownership of Documents. Pursuant to Texas Local Government Code Chapter 201, any and all Records produced by Vendor pursuant to the provisions of this contract are the exclusive property of City; and no such Record shall be the subject of any copyright or proprietary claim by Vendor. The term "Record" as used herein shall mean any document, paper, letter, book, map, photograph, sound or video recording, microfilm, magnetic tape, electronic medium, or other information recording medium, regardless of physical form or characteristic. Vendor understands and acknowledges that as the exclusive owner of any and all such Records, City has the right to use all such Records as City desires, without restriction.

Records Retention.

Vendor and its subcontractors, if any, shall properly, accurately and completely maintain all documents, papers, and records, and other evidence pertaining to the services rendered hereunder ("Documents"), and shall make such Documents available to City at their respective offices, at all reasonable times and as often as City may deem necessary during the contract period, including any extension or renewal hereof, and the record retention period established herein, for purposes of audit, inspection, examination, and making excerpts or copies of same by City and any of its authorized representatives.

Vendor shall retain any and all Documents produced as a result of services provided hereunder for a period of four years ("Retention Period") from the date of termination of the contract. If, at the end of the Retention Period, there is litigation or other questions arising from, involving or concerning these Documents or the services provided hereunder, Vendor shall retain the records until the resolution of such litigation or other such questions. Vendor acknowledges and agrees that City shall have access to any and all such Documents at any and all times, as deemed necessary by City, during said Retention Period. City may, at its election, require Vendor to return the documents to City at Vendor's expense prior to or at the conclusion of the Retention Period. In such event, Vendor may retain a copy of the documents.

Vendor shall notify City, immediately, in the event Vendor receives any requests for information from a third party, which pertain to the Documents referenced herein. Vendor understands and agrees that City will process and handle all such requests.

S.B. 943 – Disclosure Requirements for Certain Government Contracts. For contracts (1) with a stated expenditure of at least \$1 million in public funds for the purchase of goods or services by the City, or (2) that result in the expenditure of at least \$1 million in public funds for the purchase of goods or services by the City in a given fiscal year, Vendor acknowledges that the requirements of the Texas Public Information Act, Government Code, Chapter 552, Subchapter J, pertaining to the preservation and disclosure of Contracting Information maintained by the City or sent between the City and a vendor, contractor, potential vendor, or potential contractor, may apply to this offer and any resulting contract. Vendor agrees that the contract can be terminated if Vendor knowingly or intentionally fails to comply with a requirement of that subchapter.

By submitting an Offer, Offeror warrants and certifies, and a contract awarded pursuant to this RFO is made in reliance thereon, that it, has not knowingly or intentionally failed to comply with this subchapter in a previous offer or contract. City hereby relies on Vendor's certification, and if found to be false, City may reject the offer or terminate the Contract for material breach.

Severability. If any clause or provision of this contract is held invalid, illegal or unenforceable under present or future federal, state or local laws, including but not limited to the City Charter, City Code, or ordinances of the City of San Antonio, Texas, then and in that event it is the intention of the parties hereto that such invalidity, illegality or unenforceability shall not affect any other clause or provision hereof and that the remainder of this contract shall be construed as if such invalid, illegal or unenforceable clause or provision was never contained herein. It is also the intention of the parties hereto that in lieu of each clause or provision of this contract that is invalid, illegal, or unenforceable, there be added as a part of the contract a clause or provision as similar in terms to such invalid, illegal or unenforceable clause or provision as may be possible, legal, valid and enforceable.

Compliance with Law. Vendor shall provide and perform all services required under this Agreement in compliance with all applicable federal, state and local laws, rules and regulations.

Certifications. Vendor warrants and certifies that Vendor and any other person designated to provide services hereunder has the requisite training, license and/or certification to provide said services, and meets all competence standards promulgated by all other authoritative bodies, as applicable to the services provided herein.

Non-waiver of Performance. Unless otherwise specifically provided for in this Agreement, a waiver by either Party of a breach of any of the terms, conditions, covenants or guarantees of this Agreement shall not be construed or held to be a waiver of any succeeding or preceding breach of the same or any other term, condition, covenant or guarantee herein contained. Further, any failure of either Party to insist in any one or more cases upon the strict performance of any of the covenants of this Agreement, or to exercise any option herein contained, shall in no event be construed as a waiver or relinquishment for the future of such covenant or option. In fact, no waiver, change, modification or discharge by either party hereto of any provision of this Agreement shall be deemed to have been made or shall be effective unless expressed in writing and signed by the party to be charged. No act or omission by a Party shall in any manner impair or prejudice any right, power, privilege, or remedy available to that Party hereunder or by law or in equity, such rights, powers, privileges, or remedies to be always specifically preserved hereby.

Venue. Venue of any court action brought directly or indirectly by reason of this contract shall be in Bexar County, Texas. This contract is made and is to be performed in Bexar County, Texas, and is governed by the laws of the State of Texas.

Non-discrimination. As a condition of entering into this agreement, Vendor represents and warrants that it will comply with City's Commercial Nondiscrimination Policy, as described under Section III.C.1 of the SBEDA Ordinance. As part of such compliance, Vendor shall not discriminate on the basis of race, color, religion, ancestry or national origin, sex, age, marital status, sexual orientation, or on the basis of disability or other unlawful forms of discrimination in the solicitation, selection, hiring or commercial treatment of subcontractors, vendors, suppliers, or commercial customers, nor shall Vendor retaliate against any person for reporting instances of such discrimination. Vendor shall provide equal opportunity for subcontractors, vendors and suppliers to participate in all of its public sector and private sector subcontracting and supply opportunities, provided that nothing contained in this clause shall prohibit or limit otherwise lawful efforts to remedy the effects of marketplace discrimination that have occurred or are occurring in the City's Relevant Marketplace. Vendor understands and agrees that a material violation of this clause shall be considered a material breach of this agreement and may result in termination of this agreement, disqualification of Vendor from participating in City contracts, or other sanctions. This clause is not enforceable by or for the benefit of, and creates no obligation to, any third party. Vendor shall include this nondiscrimination clause in all subcontracts for the performance of this contract.

As a party to this contract, Vendor understands and agrees to comply with the *Non-Discrimination Policy* of the City of San Antonio contained in Chapter 2, Article X of the City Code and further, shall not discriminate on the basis of race, color, religion, national origin, sex, sexual orientation, gender identity, veteran status, age or disability, unless exempted by state or federal law, or as otherwise established herein.

Attorney's Fees. The Parties hereto expressly agree that, in the event of litigation, each party hereby waives its right to payment of attorneys' fees.

State Prohibitions on Contracts:

This section only applies to a contract that:

- (1) is between a governmental entity and a company with 10 or more full-time employees; and
- (2) has a value of \$100,000 or more that is to be paid wholly or partly from public funds of the governmental entity.

"Company" means a for-profit organization, association, corporation, partnership, joint venture, limited partnership, limited liability partnership, or limited liability company, including a wholly owned subsidiary, majority-owned subsidiary, parent company, or affiliate of those entities or business associations that exists to make a profit. This term does not include a sole proprietorship.

Prohibition on Contracts with Companies Boycotting Israel.

Texas Government Code §2271.002 provides that a governmental entity may not enter into a contract with a company for goods or services, unless the contract contains a written verification from the company that it: (1) does not boycott Israel; and (2) will not boycott Israel during the term of the contract.

"Boycott Israel" means refusing to deal with, terminating business activities with, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations specifically with Israel, or with a person or entity doing business in Israel or in an Israeli-controlled territory, but does not include an action made for ordinary business purposes.

By submitting an offer to or executing contract documents with the City of San Antonio, Company hereby verifies that it does not boycott Israel, and will not boycott Israel during the term of the contract. City hereby relies on Company's verification. If found to be false, City may terminate the contract for material breach.

Prohibition on Contracts with Companies Boycotting Certain Energy Companies.

Texas Government Code §2274 provides that a governmental entity may not enter into a contract with a company for goods or services, unless the contract contains a written verification from the company that it: (1) does not boycott energy companies; and (2) will not boycott energy companies during the term of the contract.

"Boycott energy company" means, without an ordinary business purpose, refusing to deal with, terminating business activities with, or otherwise taking any action that is intended to penalize, inflict economic harm on, or limit commercial relations with a company because the company: (A) engages in the exploration, production, utilization, transportation, sale, or manufacturing of fossil fuel-based energy and does not commit or pledge to meet environmental standards beyond applicable federal and state law; or (B) does business with a company described in (A).

By submitting an offer to or executing contract documents with the City of San Antonio, Company hereby verifies that it does not boycott energy companies and will not boycott energy companies during the term of the contract. City hereby relies on Company's verification. If found to be false, City may terminate the contract for material breach.

Prohibition on Contracts with Companies that Discriminate Against Firearm and Ammunition Industries.

Texas Government Code §2274 provides that a governmental entity may not enter into a contract with a company for goods or services, unless the contract contains a written verification from the company that it: (1) does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association; and (2) will not discriminate during the term of the contract against a firearm entity or firearm trade association.

"Discriminate against a firearm entity or firearm trade association": (A) means, with respect to the entity or association, to: (i) refuse to engage in the trade of any goods or services with the entity or association based solely on its status as a firearm entity or firearm trade association; (ii) refrain from continuing an existing business relationship with the entity or association based solely on its status as a firearm entity or firearm trade association; or (iii) terminate an existing business relationship with the entity or association based solely on its status as a firearm entity or firearm trade association.

By submitting an offer to or executing contract documents with the City of San Antonio, Company hereby verifies that it does not have a practice, policy, guidance, or directive that discriminates against a firearm entity or firearm trade association; and will not discriminate during the term of the contract against a firearm entity or firearm trade association. City hereby relies on Company's verification. If found to be false, City may terminate the contract for material breach.

CONTRACTS WITH COMPANIES ENGAGED IN BUSINESS WITH IRAN, SUDAN, OR FOREIGN TERRORIST ORGANIZATIONS PROHIBITED. Texas Government Code §2252.152 provides that a governmental entity may not enter into a governmental contract with a company that is identified on a list prepared and maintained under Texas Government Code §§2270.0201 or 2252.153. Vendor hereby certifies that it is not identified on such a list. City hereby relies on Vendor's certification. If found to be false, or if Vendor is identified on said list during the course of its contract with City, City may terminate the Contract for material breach.

Delinquent Taxes. In the event that Vendor is or subsequently becomes delinquent in the payment of taxes owed to the City of San Antonio, City reserves the right to deduct any delinquent taxes from payments that City may owe to the delinquent Vendor as a result of this contract.

Binding Contract. This contract shall be binding on and inure to the benefit of the parties hereto and their respective heirs, executors, administrators, legal representatives, and successors and assigns, except as otherwise expressly provided for herein.

Entire Agreement. This contract, including City's final electronically posted online version, together with its authorizing ordinance, and its price schedule(s), addendums, attachments, purchase orders, and exhibits, if any, constitutes the final and entire agreement between the parties hereto and contains all of the terms and conditions agreed upon. No other agreements, oral or otherwise, regarding the subject matter of this contract shall be deemed to exist or to bind the parties hereto, unless same be in writing, dated subsequent to the date hereof, and be duly executed by the parties, in accordance with the Amendment provision herein. **Parties agree that City's final electronically posted online version of this solicitation contains the agreed upon specifications, scope of services, and terms and conditions of this contract, and shall control in the event of a conflict with any printed version signed and submitted by Vendor.**

007 - SIGNATURE PAGE

By submitting an offer, Offeror represents that:

(s)he is authorized to bind Offeror to fully comply with the terms and conditions of City's Request for Offer for the prices stated therein;

(s)he has read the entire document, including the final version issued by City, and agreed to the terms therein;

Offeror is in good standing with the Texas State Comptroller's Office; and

to the best of his/her knowledge, all information is true and correct.

Complete the following and sign on the signature line below. Failure to sign and submit this Signature Page will result in rejection of your offer.

Offeror Information:

Please Print or Type:

Vendor ID No.: _____

Signer's Name: _____

Name of Business: _____

Street Address: _____

City, State, Zip Code: _____

Email Address: _____

Telephone No.: _____

Fax No.: _____

City's Solicitation No.: 6100017697 Foam Enhanced Pumper Truck

Signature of Person Authorized to Sign Offer

008 - STANDARD DEFINITIONS

Whenever a term defined by the Uniform Commercial Code (“UCC”), as enacted by the State of Texas, is used in the Contract, the UCC definition shall control, unless otherwise defined in the Contract.

All-or-None Offer - an RFO in which City will award the entire contract to one offeror only.

Alternate Offer - two or more offers with substantive variations in the item or service offered from the same offeror in response to a solicitation.

Assignment - a transfer of claims, rights or interests in goods, services or property.

Bid Bond - security to ensure that Offeror (a) will not withdraw the offer within the period specified for acceptance, and (b) will furnish any required bonds and any necessary insurance within the time specified in the solicitation.

City - the City of San Antonio, a Texas home-rule municipal corporation.

Contractor - the offeror whose offer is accepted by City and is, therefore, the person, firm or entity providing goods or services to City under a contract.

Director – the Director of City’s Finance Department, Purchasing Division, or Director’s designee.

Line Item - a listing of items in an offer for which an offeror is expected to provide separate pricing.

Offer - a complete, signed response to an RFO that, if accepted, would bind Offeror to perform the resultant contract.

Offeror - a person, firm or entity that submits an offer in response to a solicitation. The offeror whose offer is accepted by City may also be referred to herein as Contractor, Vendor or Supplier.

Payment Bond - a particular form of security provided by the contractor to protect City against loss due to the contractor’s failure to pay suppliers and subcontractors.

Performance Bond - a particular form of security provided by the contractor to protect City against loss due to the contractor’s inability or unwillingness to complete the contract as agreed.

Performance Deposit - security provided by the contractor to protect City against loss due to the contractor’s inability or unwillingness to complete the contract as agreed.

Pre-Submittal Conference - a meeting conducted by City, held in order to allow offerors to ask questions about the proposed contract and particularly, the contract specifications.

Purchase Order - a validly issued order placed by an authorized City department for the purchase of goods or services, written on City’s standard purchase order form, and which is the vendor’s authority to deliver to and invoice City for the goods or services specified in an RFO for the price stated in vendor’s offer.

Specifications - a description of what City requires and what Offeror must offer; a description of the physical or functional characteristics of a product or material, or the nature of a service or construction item.

Subcontractor - a person, firm or entity providing goods or services to a vendor to be used in the performance of the vendor’s obligations under the contract with City.

Supplier - the offeror whose offer is accepted by City and is, therefore, the person, firm or entity providing goods or services to City under a contract.

Vendor - the offeror whose offer is accepted by City and is, therefore, the person, firm or entity providing goods or services to City under a contract.

009 – ATTACHMENTS

ATTACHMENT A – PRICE SCHEDULE

ITEM	QUANTITY	DESCRIPTION
1	1	Foam Enhanced Pumper Truck

PRICE EACH: \$ _____

TOTAL: \$ _____

YEAR and MODEL of CAB & CHASSIS:

SPECIFIC MAKE & MODEL OF ENGINE OFFERED (INCLUDE SAE NET HP):

ENGINE WARRANTY (Must meet minimum warranty requirements stated herein):

TRANSMISSION WARRANTY (Must meet minimum warranty requirements stated herein):

WARRANTY (Must meet minimum warranty requirements stated herein):

WARRANTY SERVICE PROVIDER FACILITY NAME:

WARRANTY SERVICE PROVIDER FACILITY ADDRESS:

DELIVERY WILL BE MADE WITHIN _____ CALENDER DAYS AFTER ISSUANCE OF PURCHASE ORDER.

PRODUCTION CUT-OFF DATE FOR YEAR MODEL OFFERED: _____

INDICATE THE LAST DAY THAT THE CITY CAN PLACE ORDERS UNDER THIS CONTRACT WITHOUT MISSING THE PRODUCTION CUT OFF DATE: _____.

BID PRICES SHALL REMAIN FIRM FOR ALL ORDERS PLACED PRIOR TO THIS CUT OFF DATE. IN THE EVENT THAT CITY DOES NOT AWARD A CONTRACT PRIOR TO PRODUCTION CUT OFF DATE, CAN BIDDER PROVIDE BID ITEMS, AT THE BID PRICE SUBMITTED, AFTER THE PRODUCTION CUT OFF DATE? (YES/NO) _____

ITEM

QUANTITY

DESCRIPTION

2

1

Cooperative Fee

PRICE EACH: \$ _____

TOTAL: \$ _____

Prompt Payment Discount: _____% _____days. (If no discount is offered, Net 30 days)