



## TOWN OF MEREDITH

*Administrative Services*

*41 Main Street, Meredith, New Hampshire 03253*

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*Telephone (603) 279-4538 ♦ Fax (603) 279-1042*

### **RFP 2015 – Triple Combination Pumper/Tanker**

#### **I. General Information:**

- A. The Town of Meredith is accepting sealed requests for proposals for a Triple Combination Pumper/Tanker for the Meredith Fire Department. Proposal specifications may be obtained at Town Hall, 41 Main Street, Meredith, NH 03253 or on the Town's website at [www.meredithnh.org](http://www.meredithnh.org).
- B. Questions related to the bid specifications should be directed to the Meredith Fire Chief, Mr. Ken Jones, at 603-279-6061.
- C. Questions about submitting the sealed bid and the bid process should be directed to Brenda Vittner, Administrative Services Director at the Town Hall at 677-4208.
- D. Proposal Submission Requirements:
  1. Must submit proposal in a sealed envelope clearly marked "**RFP 2015 – TRIPLE COMBINATION PUMPER/TANKER**"
  2. Sealed Bid must be submitted to the Administrative Services Director, Brenda Vittner, at Town Hall, 41 Main Street, Meredith, NH by **2:00 pm on Monday, November 23<sup>rd</sup>, 2015**, at which time the bids will be opened.
  3. The Town reserves the right to accept or reject any and all proposals and to accept the proposal which best serves the interest of the Town of Meredith.
  4. Any proposals received after 2:00 pm on Monday, November 23<sup>rd</sup>, 2015, will not be accepted.
- E. The attached General and Detailed Specifications shall be considered as a minimum. Should the manufacturer's current published data on specifications exceed these, they shall be considered as minimum and shall be furnished.
- F. It is the intent of the Town of Meredith to award the bidder meeting these specifications without exceptions. Parts, availability, service capability and total life cost will be considered.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

**SPECIFICATIONS FOR A TRIPLE COMBINATION PUMPER/TANKER**

**INTENT OF SPECIFICATIONS**

It shall be the intent of these specifications to cover the furnishing and delivery of a complete apparatus equipped as hereinafter specified. These specifications shall cover only the general requirements as to the type of construction and test to which the apparatus shall conform, together with certain details as to finish, equipment and appliances with which the successful bidder shall conform. Minor details of construction and materials, which are not otherwise specified, are left to the discretion of the contractor. The manufacturer shall provide loose equipment only when specified by the customer. Otherwise, in accordance with the current edition of NFPA 1901 standards, the proposal shall specify whether the fire department or apparatus dealership shall provide required loose equipment.

In order to ensure fair, ethical, and legal competition, neither original equipment manufacturer (O.E.M.) or parent company of the O.E.M. shall have ever been fined or convicted of price fixing, bid rigging, or collusion in any domestic or international fire apparatus market (no exception).

Bids shall only be considered from companies that have an established reputation in the field of fire apparatus construction and have been in business for a minimum of 20 years. Further, bidder shall maintain dedicated service facilities for the repair and service of products. Evidence of such a facility shall be included in bidder proposal.

Each bidder shall furnish satisfactory evidence of their ability to construct the apparatus specified and shall state the location of the factory where the apparatus is to be built. The bidder shall also show that the company is in position to render prompt service and to furnish replacement parts for said apparatus.

Each bid shall be accompanied by a set of Contractor's Specifications consisting of a detailed description of the apparatus and equipment proposed and to which the apparatus furnished under contract shall conform. These specifications shall indicate size, type, model and make of all component parts and equipment.

**QUALITY AND WORKMANSHIP**

The design of the apparatus shall embody the latest approved automotive engineering practices. The workmanship shall be of the highest quality in its respective field. Special consideration shall be given to the following points: Accessibility of the various units which require periodic maintenance, ease of operation (including both pumping and driving) and symmetrical proportions. Construction shall be rugged and ample safety factors shall be provided to carry the loads specified and to meet both on and off road requirements and

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

speed conditions as set forth under Performance Tests and Requirements. Welding shall not be employed in the assembly of the apparatus in a manner that shall prevent the ready removal of any component part for service or repair. All steel welding shall follow American Welding Society D1.1-2004 recommendations for structural steel welding. All aluminum welding shall follow American Welding Society and ANSI D1.2-2003 requirements for structural welding of aluminum. All sheet metal welding shall follow American Welding Society B2.1-2000 requirements for structural welding of sheet metal. Flux core arc welding to use alloy rods, type 7000, American Welding Society standards A5.20-E70T1. Employees classified as welders are tested and certified to meet American Welding Society codes upon hire and every three (3) years thereafter. The manufacturer shall be required to have an American Welding Society certified welding inspector in plant during working hours to monitor weld quality.

**DELIVERY**

Apparatus, to insure proper break in of all components while still under warranty, **shall be delivered under its own power** - rail or truck freight shall not be acceptable. A qualified delivery engineer representing the contractor shall deliver the apparatus and remain for a sufficient length of time to instruct personnel in the proper operation, care and maintenance of the equipment delivered.

**DELIVERY DATE**

**A \$100.00 Per Day Late Fee** will be charged to the apparatus manufacture for delivery to Meredith Fire beyond the agreed date of signing of contract. August 1, 2016 is the deadline in which delivery must be completed with no exceptions to contract signed unless changes are agreed upon by both parties.

**DOWN PAYMENT**

A 75% Down Payment of total contract price awarded will be forwarded to manufactured awarded bid within a 14 day period upon receiving invoice of said amount. Determine savings awarded from down Payment will be subtracted from initial contract price.

**INFORMATION REQUIRED**

The manufacturer shall supply at time of delivery, complete operation and maintenance manuals covering the completed apparatus as delivered. A permanent plate shall be mounted in the driver's compartment which specifies the quantity and type of fluids required including engine oil, engine coolant, transmission, pump transmission lubrication, pump primer and drive axle.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

**SAFETY VIDEO**

Documentation provided at the time of delivery shall also include an apparatus safety video, in DVD format. This video shall address key safety considerations for personnel to follow when they are driving, operating, and maintaining the apparatus. Safety procedures for the following shall be included: vehicle pre-trip inspection, chassis operation, pump operation, and maintenance.

**PERFORMANCE TESTS AND REQUIREMENTS**

A road test shall be conducted with the apparatus fully loaded and a continuous run of ten (10) miles or more shall be made under all driving conditions, during which time the apparatus shall show no loss of power or overheating. The transmission drive shaft or shafts, and rear axles shall run quietly and be free from abnormal vibration or noise throughout the operating range of the apparatus. Vehicle shall adhere to the following parameters:

- A. The apparatus, when fully equipped and loaded, shall have not less than 25 percent nor more than 50 percent of the weight on the front axle, and not less than 50 percent nor more than 75 percent on the rear axle.
- B. The apparatus shall be capable of accelerating to 35 mph from a standing start within 25 seconds on a level concrete highway without exceeding the maximum governed rpm of the engine.
- C. The service brakes shall be capable of stopping a fully loaded vehicle in 35 feet at 20 mph on a level concrete highway. The air brake system shall conform to Federal Motor Vehicle Safety Standards (FMVSS) 121.
- D. The apparatus, fully loaded, shall be capable of obtaining a speed of 50 mph on a level concrete highway with the engine not exceeding its governed rpm (full load).

**FAILURE TO MEET TEST**

In the event the apparatus fails to meet the test requirements of these specifications on the first trial, second trials may be made at the option of the bidder within 30 days of the date of the first trial. Such trials shall be final and conclusive and failure to comply with these requirements shall be cause for rejection. Failure to comply with changes to conform to any clause of the specifications, within 30 days after notice is given to the bidder of such changes, shall also be cause for rejection of the apparatus. Permission to keep or store the apparatus in any building owned or occupied by the purchaser or its use by the purchaser during the above-specified period with the permission of the bidder shall not constitute acceptance.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

<p><b><u>LIABILITY</u></b>          The successful bidder shall defend any and all suits and assume all liability for the use of any patented process including any device or article forming a part of the apparatus or any appliance furnished under the contract.</p> <p><b><u>SPECIFICATION BID REQUIREMENTS</u></b>          Bidders shall also indicate in the "yes/no" column if their bid complies <b>on each item</b> (PARAGRAPH) specified. Exceptions shall be allowed if they are equal to or superior to that specified and provided they are listed and fully explained on a separate page. <b>Proposals taking total exception to specifications shall not be acceptable.</b> Also, bidders shall submit a detailed proposal. A letter only, even though written on a company letterhead, shall not be sufficient. Bid proposals shall be submitted in the same sequence as specifications for ease of evaluation, comparison and checking of compliance. <b>An exception to these requirements shall not be tolerated.</b></p> <p><b><u>EXCEPTIONS</u></b>          All exceptions shall be stated no matter how seemingly minor. Any exceptions not taken shall be assumed by the purchaser to be included in the proposal, regardless of the cost to the bidder.</p> <p><b><u>GENERAL CONSTRUCTION</u></b>          The apparatus shall be designed with due consideration to distribution of load between the front and rear axles. Weight balance and distribution shall be in accordance with the recommendations of the National Fire Protection Association.</p> <p><b><u>COMMERCIAL GENERAL LIABILITY INSURANCE</u></b>          The successful bidder shall, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of commercial general liability insurance:          Each Occurrence \$1,000,000          Products/Completed Operations Aggregate \$1,000,000          Personal and Advertising Injury \$1,000,000          General Aggregate \$5,000,000          Coverage shall be written on a Commercial General Liability form. The policy shall be written on an occurrence form and shall include Contractual Liability coverage for bodily injury and property damage subject to the terms and conditions of the policy. The policy shall include Owner as an additional insured when required by written contract.</p>	
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**II. Minimum Specifications:**

**Bidder Complies**

**Yes      No**

**COMMERCIAL AUTOMOBILE LIABILITY INSURANCE**

The successful bidder shall, during the performance of the contract keep in force at least the following minimum limits of commercial automobile liability insurance:

Each Accident Combined Single Limit:\$1,000,000 Coverage shall be written on a Commercial Automobile liability form.

**UMBRELLA/EXCESS LIABILITY INSURANCE**

The successful bidder shall, during the performance of the contract and for three (3)years following acceptance of the product, keep in force at least the following minimum limits of umbrella liability insurance:

Aggregate:\$25,000,000

Each Occurrence:\$25,000,000

The umbrella policy shall be written on an occurrence basis and at a minimum provide excess to the Bidder's General Liability, Automobile Liability and Employer's Liability policies. The required limits can be provided by one (1) or more policies provided all other insurance requirements are met. Coverage shall be provided by a carrier(s) rated A- or better by A.M. Bests. All policies shall provide a 30 day notice of cancellation to the named insured. The Certificate of Insurance shall provide the following cancellation clause: Should any of the above described polices be cancelled before the expiration date thereof, notice shall be delivered in accordance with the policy provisions. Bidder agrees to furnish owner with a current Certificate of Insurance with the coverages listed above along with its bid. The certificate shall show the purchaser as certificate holder.

**ISO COMPLIANCE**

The manufacturer shall operate a Quality Management System under the requirements of ISO 9001. These standards sponsored by the International Organization for Standardization (ISO) specify the quality systems that shall be established by the manufacturer for design, manufacture, installation and service. A copy of the certificate of compliance shall be included with the bid.

**SINGLE SOURCE MANUFACTURER**

Bids shall only be accepted from a single source apparatus manufacturer. The definition of single source is a manufacturer that designs and manufactures their products using an integrated approach, including the chassis, cab weldment, cab, pumphouse (including the sheet metal enclosure, valve controls, piping and operators panel) and body being designed, fabricated and assembled on the bidder's premises. The electrical system (hardwire or multiplex) shall be both designed and integrated by the same apparatus manufacturer. The warranties relative to these major components (excluding component warranties such as engine, transmission, axles, pump, etc.) must be from a single source manufacturer and not split between manufacturers (i.e. body, pump house, cab weldment

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

and chassis). The bidder shall provide evidence that they comply with this requirement. The bidder shall state the location of the factory where the apparatus is to be built.

**NFPA 2009 STANDARDS**

This unit shall comply with the NFPA standards effective January 1, 2009, except for fire department directed exceptions. These exceptions shall be set forth in the Statement of Exceptions. Certification of slip resistance of all stepping, standing and walking surfaces shall be supplied with delivery of the apparatus.

A plate that is highly visible to the driver while seated shall be provided. This plate shall show the overall height, length, and gross vehicle weight rating. The manufacturer shall have programs in place for training, proficiency testing and performance for any staff involved with certifications. An official of the company shall designate, in writing, who is qualified to witness and certify test results.

**NFPA COMPLIANCY**

Apparatus proposed by the bidder shall 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 shall be indicated in the proposal as "non-NFPA".

**VEHICLE INSPECTION PROGRAM CERTIFICATION**

To assure the vehicle is built to current NFPA standards, the apparatus, in its entirety, shall be third-party, independent, audit-certified through a third party, that it is built and complies to all applicable standards in the current edition of NFPA 1901. The certification includes: all design, production, operational, and performance testing of not only the apparatus, but those components that are installed on the apparatus (no exception). A placard shall 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.

**PUMP TEST**

The pump shall be tested, approved, and certified at the manufacturer's expense. The test results and the pump manufacturer's certification of hydrostatic test; the engine manufacturer's certified brake horsepower curve; and the manufacturer's record of pump construction details shall be forwarded to the Fire Department.

**GENERATOR TEST**

If the unit has a generator, the generator shall be tested, approved, and certified at the manufacturer's expense. The test results shall be provided to the Fire Department at the time of delivery.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

**BREATHING AIR TEST**

If the unit has breathing air, an air sample shall be drawn from the air system to certify that the air quality meets the requirements of NFPA 1989, Standard on Breathing Air Quality for Fire and Emergency Services Respiratory Protection.

**INSPECTION TRIP(S)**

The bidder shall provide two (2) factory inspection trip(s) for three (3) Meredith Fire Department customer representative(s). The inspection trip(s) shall be scheduled at times mutually agreed upon between the manufacturer's representative and the customer. All costs such as travel, lodging and meals shall be the responsibility of the bidder.

**AFTERMARKET SUPPORT WEBSITE**

A Customer Service website shall provide authorized dealers access to comprehensive information pertaining to the maintenance and service of their customer's apparatus. This tool shall provide the authorized dealer the ability to service and support their customers to the best of their ability with factory support at their fingertips. This website shall also be accessible to the end user through the guest login. Limited access is available and vehicle specific parts information accessible by entering a specific VIN number. All end users should see their local authorized dealer for additional support and service. The website shall provide the following to the designated individuals:

- Authorized dealer only - ability to access truck detail information on the major components of the vehicle, warranty information, available vehicle photographs, vehicle drawings, sales options, applicable vehicle software downloads, etc.
- Authorized dealer and customer - parts look-up capability, with the aid of digital photographs, part drawings, and assembly drawings.
- Authorized dealer only - ability to electronically submit warranty claims directly to the factory for reimbursement.
- Authorized dealer only - accessibility to multiple dealer reports that allow the dealership to maintain communication with the customer on the status of orders, claims, and phone contacts.
- Authorized dealer and customer - access to all currently published Operation and Maintenance and Service publications.
- Authorized dealer only - access to manufacturer Service Bulletins and Work Instructions containing information on current service topics and recommendations provided.
- Authorized dealer and customer - access to upcoming training classes offered by the manufacturer.
- Authorized dealer only - access to interactive electronic learning modules (Operators Guides) covering the operation of major vehicle components.
- Authorized dealer only - access to customer service articles, corporate news, quarterly newsletters, and key contacts.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

<p><b><u>BID BOND</u></b></p> <p>All bidders shall provide a bid bond as security for the bid in the form of a 10% bid bond on accompany their bid. This bid bond shall be issued by a Surety Company who is listed on the U.S. Treasury Departments list of acceptable sureties as published in Department Circular 570. The bid bond shall be issued by an authorized representative of the Surety Company and shall be accompanied by a certified power of attorney dated on or before the date of bid. The bid bond shall include language, which assures that the bidder/principal shall give a bond or bonds as may be specified in the bidding or contract documents, with good and sufficient surety for the faithful performance of the contract, including the Basic One (1) Year Limited Warranty, and for the prompt payment of labor and material furnished in the prosecution of the contract. Proposals received from bidders who do not manufacture the chassis shall provide a warranty that shall be issued jointly and severally by, and signed by, both the bidder and the chassis manufacturer.</p> <p>If the successful bidder does not manufacture the chassis, the bidder shall supply a warranty bond, in addition to their performance bond, along with their signed contract. This warranty bond shall guarantee all terms and conditions of the Basic One (1) Year Limited Warranty and names both the bidder and chassis manufacturer as co-principals. This warranty bond shall be issued for the contract amount and shall remain in force for a term which is consistent with the term of the Basic One (1) Year Limited Warranty. Notwithstanding any document or assertion to the contrary, any surety bond related to the sale of a vehicle shall apply only to the Basic One (1) Year Limited Warranty for such vehicle. Any surety bond related to the sale of a vehicle shall not apply to any other warranties that are included within this bid (OEM or otherwise) or to the warranties (if any) of any third party of any part, component, attachment or accessory that is incorporated into or attached to the vehicle. In the event of any contradiction or inconsistency between this provision and any other document or assertion, this provision shall prevail.</p> <p><b><u>PERFORMANCE BOND, 1 YEAR</u></b></p> <p>The successful bidder shall furnish a Performance and Payment bond (Bond) equal to 100 percent of the total contract amount within 30 days of the notice of award. Such Bond shall be in a form acceptable to the Owner and issued by a surety company included within the Department of Treasury's Listing of Approved Sureties (Department Circular 570) with a minimum A.M. Best Financial Strength Rating of A and Size Category of XV. In the event of a bond issued by a surety of a lesser Size Category, a minimum Financial Strength rating of A+ is required.</p> <p>Bidder and Bidder's surety agree that the Bond issued hereunder, whether expressly stated or not, also includes the surety's guarantee of the vehicle manufacturer's Basic One (1) Year Limited Warranty period included within this proposal. Owner agrees that the penal amount of this bond shall be simultaneously amended to 100% percent of the total contract</p>	
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**II. Minimum Specifications:**

**Bidder Complies**

**Yes      No**

amount upon satisfactory acceptance and delivery of the vehicle(s) included herein. Notwithstanding anything contained within this contract to the contrary, the surety's liability for any warranties of any type shall not exceed one (1) year from the date of such satisfactory acceptance and delivery, or the actual Basic One (1) Year Limited Warranty period, whichever is shorter.

**APPROVAL DRAWING**

A drawing of the proposed apparatus shall be provided for approval before construction begins. The sales representative shall also have a copy of the same drawing. The finalized and approved drawing shall become part of the contract documents. This drawing shall indicate the chassis make and model, location of the lights, siren, horns, compartments, major components, etc. A "revised" approval drawing of the apparatus shall be prepared and submitted by the manufacturer to the purchaser showing any changes made to the approval drawing.

**ELECTRICAL WIRING DIAGRAMS**

Two (2) electrical wiring diagrams, prepared for the model of chassis and body, shall be provided.

**CHASSIS**

Chassis provided shall be a new, tilt-type custom fire apparatus. The chassis shall be manufactured in the apparatus body builder's facility eliminating any split responsibility. The chassis shall be designed and manufactured for heavy-duty service, with adequate strength, capacity for the intended load to be sustained, and the type of service required. The chassis shall be the manufacturer's heavy-duty line tilt cab.

**TARGET OVERALL LENGTH**

The target overall length of the apparatus shall be 35 Feet .

**WHEELBASE**

The wheelbase of the vehicle shall be no greater than 215.00 inches.

**GVW RATING**

The gross vehicle weight rating shall be a minimum of 80,800 Pounds.

**FRAME**

The chassis frame shall 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 shall 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.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

Each rail shall 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 an rbm of 2,275,200 in-lb over the rear axle. The frame rails shall be constructed of 120,000 psi yield strength heat-treated 0.38" thick steel with 3.50" wide flanges.

**FRAME REINFORCEMENT**

In addition, a mainframe inverted "L" liner shall be provided. It shall be heat-treated steel measuring 12.00" x 3.00" x 0.25". Each liner shall have a section modulus of 7.795 cubic inches, yield strength of 110,000 psi, and rbm of 857,462 in-lb. Total rbm at wheelbase center shall be 3,976,502 in-lb. The frame liner shall be mounted inside of the chassis frame rail and extend the full length of the frame.

**FRONT NON DRIVE AXLE**

The front axle shall be of the independent suspension design with a ground rating of 22,800 lb. The turning angle shall be 45 degrees.

**FRONT SUSPENSION**

Front independent suspension shall be provided with a minimum ground rating of 22,800 lb.

**FRONT SHOCK ABSORBERS**

Heavy-duty telescoping shock absorbers shall be provided on the front suspension.

**FRONT OIL SEALS**

Oil seals with viewing window shall be provided on the front axle.

**FRONT TIRES**

Front tires shall be 425/65R22.50 radials, 20 ply all-position tread, rated for 22,800 lb maximum axle load and 65 mph maximum speed. The tires shall be mounted on 22.50" x 12.25" steel disc type wheels with a ten (10)-stud, 11.25" bolt circle.

**TURNING RADIUS REPORT**

Supplied with the bid shall be a turning radius analysis of the vehicle being proposed. This analysis shall provide the inside turning radius, the outside turning radius, the curb to curb turning radius, and the wall to wall turning radius.

**REAR AXLE**

The rear axle shall be a tandem axle assembly with a capacity of 58,000 lb. An inter-axle differential, which divides torque evenly between axles, shall be provided, with an indicator light mounted on the cab instrument panel.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

<p><b><u>TOP SPEED OF VEHICLE</u></b>            NFPA 1901, 2009 edition requires limits on the top speed of vehicles. NFPA 4.15.2 requires that the maximum top speed of fire apparatus with a GVWR over 26,000 lb shall not exceed either 68 mph or the manufacturer's maximum fire service speed rating for the tires installed on the apparatus, whichever is lower. NFPA 4.15.3 requires that if the combined water tank and foam agent tank on the fire apparatus exceed 1250 gallons or the GVWR of the vehicle is over 50,000 lb, the maximum top speed of the apparatus shall not exceed either 60 mph or the manufacturer's maximum fire service speed rating for the tires installed on the apparatus, whichever is lower. It is the intention of the standard to improve safety by limiting the speed of all apparatus to 68 mph, and tankers or heavy apparatus to 60 mph. By requesting an exception to this requirement, the purchasing authority is consciously choosing to operate their apparatus at speeds above the limits designated as safe speeds by the NFPA Technical Committee on Fire Department Apparatus. The top speed of the apparatus as manufactured exceeds the NFPA requirements. Per fire department specification of a top speed that exceeds NFPA requirements, the apparatus shall be non-compliant to NFPA 1901 standards at time of contract execution. A rear axle ratio shall be furnished to allow the vehicle to reach an approximate top speed of 63 MPH.</p> <p><b><u>SUSPENSION, REAR</u></b>            Rear suspension shall have individually articulating torque beams pivoted to a compensator providing independent axle movement and steady load distribution. Ground rating of the suspension to be 60,000 lb.</p> <p><b><u>REAR OIL SEALS</u></b>            Oil seals shall be provided on the rear axle.</p> <p><b><u>REAR TIRES</u></b>            Rear tires shall be eight (8) 315/80R22.50 radials, 20 ply "all position" tread, rated for 66,160 lb maximum axle load and 65 mph maximum speed. The tires shall be mounted on 22.50" x 9.00" steel disc type wheels with a ten (10) stud, 11.25" bolt circle.</p> <p><b><u>TIRE BALANCE</u></b>            All tires shall be balanced with balancing beads. The beads shall be inserted into the tire and eliminate the need for wheel weights.</p> <p><b><u>TIRE PRESSURE MANAGEMENT</u></b>            There shall be a LED tire alert pressure management system provided, that shall monitor each tire's pressure. A sensor shall be provided on the valve stem of each tire for a total of 10 tires. The sensor shall calibrate to the tire pressure when installed on the valve stem for pressures between 10 and 200 psi. The sensor shall activate an integral battery operated LED when the pressure of that tire drops 5 to 8 psi. Removing the cap from the sensor</p>	
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**II. Minimum Specifications:**

Bidder Complies	
Yes	No

shall indicate the functionality of the sensor and battery. If the sensor and battery are in working condition, the LED shall immediately start to flash.

**FRONT HUB COVERS**

Stainless steel hub covers shall be provided on the front axle. An oil level viewing window shall be provided.

**HUB COVERS (REAR)**

Stainless steel baby moon covers shall be provided over the rear axle hubs.

**CHROME LUG NUT COVERS**

Chrome lug nut covers shall be supplied on front and rear wheels.

**MUD FLAPS**

Mud flaps shall be installed behind the front and rear wheels and ahead of the rear wheels of the apparatus.

**WHEEL CHOCKS**

There shall be one (1) pair of folding aluminum alloy wheel blocks, with easy-grip handle provided.

**WHEEL CHOCK BRACKETS**

There shall be one (1) pair of horizontal mounting wheel chock brackets provided for the folding wheel chocks. The brackets shall be made of aluminum and consist of a quick release spring loaded rod to hold the wheel chocks in place. The brackets shall be mounted one (1) forward and one (1) rearward of the left side rear tire.

**ELECTRONIC STABILITY CONTROL**

A vehicle control system shall be provided as an integral part of the ABS brake system from Meritor Wabco. The system shall 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 shall 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. The system shall 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 shall selectively apply brakes to the individual wheel ends of the front and rear axles to bring the vehicle back to its intended direction.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

<p><b><u>ANTI-LOCK BRAKE SYSTEM</u></b>  The vehicle shall be equipped with an anti-lock braking system. The ABS shall provide a six (6) channel anti-lock braking control on both the front and rear wheels. A digitally controlled system that utilizes microprocessor technology shall control the anti-lock braking system. Each wheel shall be monitored by the system. When any wheel begins to lockup, a signal shall be sent to the control unit. This control unit shall then reduce the braking of that wheel for a fraction of a second and then reapply the brake. This anti-lock brake system shall eliminate the lockup of any wheel thus helping to prevent the apparatus from skidding out of control.</p> <p><b><u>AUTOMATIC TRACTION CONTROL</u></b>  An anti-slip feature shall be included with the ABS. The Automatic Traction Control shall be used for traction in poor road and weather conditions. The Automatic Traction Control shall act as an electronic differential lock that shall not allow a driving wheel to spin, thereby supplying traction at all times. The ABS electronic control unit (ECU) shall work with the engine ECU, sharing information concerning wheel slip. Engine ECU shall 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. A "mud/snow" switch shall be provided on the instrument panel. Activation of the switch shall allow additional tire slip to let the truck climb out and get on top of deep snow or mud.</p> <p><b><u>BRAKES</u></b>  The service brake system shall be full air type. The front brakes shall be 17.00" disc type. The rear brakes shall be 16.50" x 7.00" cam operated with automatic slack adjusters. Dust shields shall be provided.</p> <p><b><u>AIR COMPRESSOR, BRAKE SYSTEM</u></b>  The air compressor shall have 15.80 cubic feet per minute output at 1,250 rpm.</p> <p><b><u>BRAKE SYSTEM</u></b>  The brake system shall include:  - Bendix dual brake treadle valve with vinyl covered foot surface  - Heated automatic moisture ejector on air dryer  - Total air system capacity of 8,108 cubic inches  - Two (2) air pressure gauges with a red warning light and an audible alarm, that activates when air pressure falls below 60 psi  - Spring set parking brake system  - Parking brake operated by a push-pull style control valve  - A parking "brake on" indicator light on instrument panel  - Park brake relay/inversion and anti-compounding valve, in conjunction with a double check valve system, shall be provided with an automatic spring brake</p>	
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**II. Minimum Specifications:**

Bidder Complies	
Yes	No

<p>application at 40 psi</p> <p>- A pressure protection valve shall be provided to prevent all air operated accessories from drawing air from the air system when the system pressure drops below 80 psi (550 kPa). The air tank shall be primed and painted to meet a minimum 750 hour salt spray test. To reduce the effects of corrosion, the air tank shall be mounted with stainless steel brackets. (no exception).</p> <p><b><u>BRAKE SYSTEM AIR DRYER</u></b></p> <p>The air dryer shall be properly sized for the brake system with spin-on coalescing filter cartridge and 100 watt heater.</p> <p><b><u>BRAKE LINES</u></b></p> <p>Color-coded nylon brake lines shall be provided. The lines shall be wrapped in a heat protective loom where necessary in the chassis.</p> <p><b><u>AIR INLET</u></b></p> <p>One (1) air inlet with male coupling shall be provided. It shall allow station air to be supplied to the apparatus brake system through a shoreline hose. The inlet shall be located on the driver side pump panel. A check valve shall be provided to prevent reverse flow of air. The inlet shall discharge into the "wet" tank of the brake system. A mating female coupling shall also be provided with the loose equipment.</p> <p><b><u>ALL WHEEL LOCK-UP</u></b></p> <p>An additional all wheel lock-up system shall be installed which applies air to the front brakes only. The standard spring brake control valve system shall be used for the rear.</p> <p><b><u>ENGINE</u></b></p> <p>The chassis shall be powered by an electronically controlled engine as described below:          Power: 525 hp at 1625 rpm          Torque: 1850 lb-ft at 1075 rpm          Governed Speed: 2200 rpm          Emissions Certification: EPA 2016 (GHG17)          Fuel: Diesel Cylinders: Six (6)          Displacement: 781 cubic inches (12.8L)          Starter: Heavy duty          Fuel Filters: Dual cartridge style with check valve, water separator, and water in fuel sensor. The engine shall include On-board diagnostics (OBD), which provides self diagnostic and reporting. The system shall give the owner or repair technician access to state of health information for various vehicle sub systems. The system shall monitor vehicle systems, engine and after treatment. The system shall illuminate a malfunction indicator light on the dash console if a problem is detected.</p>	
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**II. Minimum Specifications:**

Bidder Complies	
Yes	No

**HIGH IDLE**

A high idle switch shall be provided, inside the cab, on the instrument panel, that shall automatically maintain a preset engine rpm. A switch shall be installed, at the cab instrument panel, for activation/deactivation. The high idle shall be operational only when the parking brake is on and the truck transmission is in neutral. A green indicator light shall be provided, adjacent to the switch. The light shall illuminate when the above conditions are met. The light shall be labeled "OK to Engage High Idle."

**ENGINE BRAKE**

An engine brake is to be installed with the controls located on the instrument panel within easy reach of the driver. The driver shall be able to turn the engine brake system on/off and have a high and medium setting. The engine brake shall be installed in such a manner that when the engine brake is slowing the vehicle the brake lights are activated. The ABS system shall automatically disengage the auxiliary braking device when required.

**CLUTCH FAN**

A fan clutch shall be provided. The fan clutch shall be automatic when the pump transmission is in "Road" position, and fully engaged in "Pump" position.

**ENGINE AIR INTAKE**

The air intake with an ember separator shall be mounted high on the passenger side of the cab, to the front of the crew cab door. The ember separator is designed to prevent road dirt and recirculating hot air from entering the engine.

The ember separator shall be easily accessible through a hinged stainless steel grille, with one (1) flush quarter turn latch.

**EXHAUST SYSTEM**

The exhaust system shall include a diesel particulate filter (DPF) and a selective catalytic reduction (SCR) device to meet current EPA standards. The exhaust system shall be stainless steel from the turbo to the inlet of the SCR device and shall be 5.00" in diameter. An insulation wrap shall be provided on all exhaust pipes between the turbo and SCR to minimize the transfer of heat to the cab. The exhaust shall terminate horizontally ahead of the passenger side rear wheels. A tailpipe diffuser shall be provided to reduce the temperature of the exhaust as it exits. Heat deflector shields shall be provided to isolate chassis and body components from the heat of the tailpipe diffuser.

**RADIATOR**

The radiator and the complete cooling system shall meet or exceed NFPA and engine manufacturer cooling system standards. For maximum cooling performance, the radiator core shall be made of copper fins having a serpentine design, soldered to brass tubes. The

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

tubes shall be welded to brass headers for increased strength, longer road life and solder-bloom corrosion protection. The radiator core shall have a minimum frontal area of 1,396 square inches. Steel supply and return tanks shall be bolted to the core headers and steel side channels to complete the radiator assembly. The radiator shall be compatible with commercial antifreeze solutions.

The radiator shall 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 shall be isolated from the chassis frame rails with rubber isolators. The radiator shall include an integral de-aeration tank, with a remote-mounted overflow tank. For visual coolant level inspection, the radiator shall have a built-in sight glass. The radiator shall be equipped with a 15 psi pressure relief cap. A drain port shall 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. A heavy-duty fan shall draw in fresh, cool air through the radiator. Shields or baffles shall be provided to prevent recirculation of hot air to the inlet side of the radiator.

**COOLANT LINES**

Rubber hose shall be used for all engine coolant lines to be installed by the chassis manufacturer. Hose clamps shall be stainless steel constant torque type to prevent coolant leakage. They shall react to temperature changes in the cooling system and expand or contract accordingly while maintaining a constant clamping pressure on the hose.

**FUEL TANK**

A 65 gallon fuel tank shall be provided and mounted at the rear of the chassis. The tank shall be constructed of unpainted stainless steel. It shall be equipped with swash partitions and a vent. To reduce the effects of corrosion, the fuel tank shall be mounted with stainless steel straps. (no exception). A .75" drain plug shall be provided in a low point of the tank for drainage. A fill inlet shall be located on the left 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". A .50" diameter vent shall be provided running from top of tank to just below fuel fill inlet. The tank shall meet all FHWA 393.67 requirements, including a fill capacity of 95 percent of tank volume. All fuel lines shall be provided as recommended by the engine manufacturer.

**DIESEL EXHAUST FLUID TANK**

A 4.5 gallon diesel exhaust fluid (DEF) tank shall be provided and mounted in the driver's side body forward of the rear axle. A 0.50" drain plug shall be provided in a low point of the tank for drainage. A fill inlet shall be provided and marked "Diesel Exhaust Fluid Only". The fill inlet shall be located below the air bottle storage behind a common door on the driver side of the vehicle. The tank shall meet the engine manufacturer's requirement for

**II. Minimum Specifications:**

**Bidder Complies**

**Yes      No**

10 percent expansion space in the event of tank freezing. The tank shall include an integrated heater unit that utilizes engine coolant to thaw the DEF in the event of freezing.

**FUEL SHUTOFF**

A shutoff valve shall be installed in the fuel line, at the fuel tank.

**FUEL COOLER**

An air to fuel cooler shall be installed in the engine fuel return line.

**TRANSMISSION**

An electronic, torque converting, automatic transmission shall be provided. The transmission shall be equipped with prognostics to monitor oil life, filter life, and transmission health. A wrench icon on the shift selector's digital display shall indicate when service is due. Two (2) PTO openings shall be located on left side and top of converter housing (positions 8 o'clock and 1 o'clock). A transmission temperature gauge with red light and buzzer shall be installed on the cab instrument panel.

**TRANSMISSION SHIFTER**

A six (6)-speed push button shift module shall be mounted to right of driver on console. Shift position indicator shall be indirectly lit for after dark operation.

The transmission ratio shall 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

**TRANSMISSION COOLER**

A transmission oil cooler shall be provided that is integral to the radiator and located at the bottom of the radiator. The cooler shall use engine coolant to control the transmission oil temperature.

**SYNTHETIC FLUID ONLY TAG**

A tag shall be located at the transmission fill point labeled "Synthetic Fluid Only".

**TRANSMISSION FLUID**

The transmission shall be provided with heavy duty synthetic transmission fluid.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

**DRIVELINE**

Drivelines shall be a heavy-duty metal tube and be equipped with universal joints. The shafts shall be dynamically balanced before installation. A splined slip joint shall be provided in each driveshaft.

**STEERING**

Dual steering gears, with integral heavy-duty power steering, shall be provided. For reduced system temperatures, the power steering shall incorporate an air to oil cooler and a hydraulic pump with integral pressure and flow control. All power steering lines shall have wire braded lines with crimped fittings. A tilt and telescopic steering column shall be provided to improve fit for a broader range of driver configurations.

**STEERING WHEEL**

The steering wheel shall be 18.00" in diameter, have tilting and telescoping capabilities, and a 4-spoke design.

**LOGO AND CUSTOMER DESIGNATION ON DASH**

The dash panel shall have an emblem containing the fire apparatus manufacturer's logo and customer name. The emblem shall have three (3) rows of text for the customer's department name. There shall be a maximum of eight (8) characters in the first row, 11 characters in the second row and 11 characters in the third row.

The first row of text shall be: MEREDITH

The second row of text shall be: FIRE

The third row of text shall be: DEPARTMENT

**AUTOMATIC CHASSIS LUBRICATION**

A automatic lube system shall be provided. The lubrication shall be supplied while the vehicle ignition switch is active to allow a uniform application of grease to the locations listed. The electronic control unit that forms part of the system shall activate the pump after an adjustable interval time. The unit shall control and monitor pump operation and report any faults via an indicator light on the driver's dashboard of the cab. The lubrication system reservoir, which requires a 15.00" wide x 14.50" high x 6.25" deep mounting area, shall be located in the pumphouse, in the right front corner on the apparatus.

- Cab Tilt Pivots
- Independent Suspension Control Arm Pivot Points
- Rear Axle Slack Adjusters

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- Rear Axle Brake Cam Screws
- Rear Suspension Spring Pins
- Rear Suspension Shackle Pins
- Walking Beam Pins Tandem axle, if applicable

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

<p><b><u>BUMPER</u></b>  A one (1) piece, stainless steel bumper shall be attached to the front of the chassis frame. A 9.00" formed steel channel shall be mounted directly behind bumper for additional strength.</p> <p><b><u>GRAVEL PAN</u></b>  A gravel pan, constructed of bright aluminum treadplate, shall be furnished between the bumper and cab face.</p> <p><b><u>LIFT AND TOW MOUNTS</u></b>  Mounted to the frame extension shall be lift and tow mounts. The lift and tow mounts shall be designed and positioned to adapt to certain tow truck lift systems.  The lift and tow mounts with eyes shall be painted the same color as the frame.</p> <p><b><u>TOW HOOKS</u></b>  No tow hooks are to be provided. This truck shall be equipped with a lift and tow package with integral tow eyes.</p> <p><b><u>FRONT BUMPER NOTCH</u></b>  The front bumper shall be notched for recessing of the Q2B siren. The notch shall be designed so that the bumper is one (1) continuous piece. The notch shall be welded in place for strength with a continuous top and bottom flange. All areas shall be polished for appearance. The siren shall be located center of the bumper.</p> <p><b><u>CAB</u></b>  The cab shall be designed specifically for the fire service and shall be manufactured by the chassis builder. The cab shall be built by the apparatus manufacturer in a facility located on the manufacturer's premises (no exception).  For reasons of structural integrity and enhanced occupant protection, the cab shall be of heavy duty design, constructed to the following minimal standards.  The cab shall 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 shall be constructed of solid A356-T5 aluminum. The B-pillar and C-pillar shall be constructed from 0.25" heavy wall extrusions. The rear wall shall 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 shall run from the floor to 6.50" x 4.875" x 0.1875" thick roof extrusions to provide a cage-like structure with the A-pillar and roof extrusions being welded into a 0.36" thick corner casting at each of the front corners of the roof assembly. The front of the cab shall be constructed of a 0.25" thick gusset plate, covered with a 0.090" front skin (for a total thickness of 0.34"), and reinforced with a 95.00" wide x</p>	
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**II. Minimum Specifications:**

Bidder Complies	
Yes	No

11.13" deep x 0.50" thick cross-cab support located just below the windshield. The cross-cab support shall run the full width of the cab and weld to each A-pillar, the 0.25" thick gusset plate and the front skin. The cab floors shall be constructed of 0.1875" thick aluminum plate and reinforced at the firewall with an additional 0.50" thick cross-floor support providing a total thickness of 0.6875" of structural material at the front floor area. The front floor area shall also be supported with one (1) 0.50" plate bolted to one (1) 0.78" plate that also provides the mounting point for the cab lift. This tubing shall run from the front of the cab to the 0.187" thick engine tunnel, creating the structure to support the forces created when lifting the cab. The cab shall be 94.75" wide (outside door skin to outside door skin) to maintain maximum maneuverability (no exception). The forward cab section shall have an overall height (from the cab roof to the ground) of approximately 103.00". The crew cab section shall have a 10.00" raised roof, with an overall cab height of approximately 113.00". The overall height listed shall 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 shall increase the overall height listed. The floor to ceiling height inside the crew cab shall be 64.00" in the center and 69.25" in the outboard positions. The crew cab floor shall measure 40.12" from rear wall to the back side of engine tunnel. The engine tunnel, at the rearward highest point (knee level), shall measure 47.75" to the back wall. The crew cab shall be of the totally enclosed design with access doors constructed in the same manner as the driver and passenger doors. The cab shall be a full tilt cab style. A 3-point cab mount system with rubber isolators shall improve ride quality by isolating chassis vibrations from the cab.

**INTERIOR CAB INSULATION**  
 The cab shall include 1.50" insulation in the ceiling and side walls, and 2.00" insulation in the rear wall to maximize acoustic absorption and thermal insulation.

**FENDER LINERS**  
 Full circular inner fender liners in the wheel wells shall be provided.

**WINDSHIELD**  
 A curved safety glass windshield shall be provided with over 2,754 square inches of clear viewing area. The cab windshield shall have bright trim inserts in the rubber molding holding the glass in place. Economical windshield replacement glass shall be readily available from local auto glass suppliers. All cab glass shall be tinted.

**WINDSHIELD WIPERS**  
 Two (2) electric windshield wipers with washer shall be provided that meet FMVSS and SAE requirements. The washer reservoir shall be able to be filled without raising the cab.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

<p><b><u>GLOVE BOX</u></b>  A glove box with a drop-down door shall be installed in the front dash panel in front of the officer's position.</p> <p><b><u>ENGINE TUNNEL</u></b>  Engine hood side walls shall be constructed of 0.50" aluminum. The top shall be constructed of 0.19" aluminum and shall be tapered at the top to allow for more driver and passenger elbow room. The engine hood shall be insulated for protection from heat and sound. The noise insulation keeps the DBA level within the limits stated in the current NFPA 1901 standards.</p> <p><b><u>CAB REAR WALL EXTERIOR COVERING</u></b>  The exterior surface of the rear wall of the cab shall be overlaid with bright aluminum tread plate except for areas that are not typically visible when the cab is lowered.</p> <p><b><u>CAB LIFT</u></b>  A hydraulic cab lift system shall be provided consisting of an electric powered hydraulic pump, dual lift cylinders, and necessary hoses and valves. The hydraulic pump shall have a manual override for backup in the event of electrical failure.  Lift controls shall be on a panel located on the pump panel or front area of the body in a convenient location. The engine shall be easily accessible and capable of being removed with the cab tilted. The cab shall be capable of tilting 45 degrees and 90 degrees with crane assist. Cab shall be locked down by a 2-point automatic spring-loaded hook mechanism that actuates after the cab has been lowered.  The hydraulic cylinders shall be equipped with a velocity fuse that protects the cab from accidentally descending when the control is located in the tilt position.  For increased safety, a redundant mechanical stay arm shall be provided that must be manually put in place on the driver side between the chassis and cab frame when the cab is in the raised position. This device shall be manually stowed to its original position before the cab can be lowered.</p> <p><b><u>CAB LIFT INTERLOCK</u></b>  The cab lift system shall be interlocked to the parking brake. The cab tilt mechanism shall 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 shall be disabled.</p> <p><b><u>GRILLE</u></b>  A bright finished aluminum mesh grille screen, inserted behind a bright finished grille surround, shall be provided on the front center of the cab.</p>	
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**II. Minimum Specifications:**

Bidder Complies	
Yes	No

**SCUFFPLATE**

A brushed stainless steel scuffplate shall be provided on the entire rear vertical surface of the engine tunnel.

**DOOR JAMB SCUFFPLATES**

All cab door jambs shall be furnished with a brushed stainless steel scuffplate, mounted on the striker side of the jamb.

**SCUFFPLATES, REAR CAB CORNER GUARDS**

Both rear cab corners shall be furnished with a full height, brushed stainless steel corner guard scuffplate. The guard shall extend 1.00" from the corner to protect paint from damage when pulling items (such as booster hose) around the cab.

**SIDE OF CAB MOLDING**

Chrome molding shall be provided on both sides of cab.

**MIRRORS**

A dual vision, motorized, west coast style mirror, with chrome finish, shall be mounted on each side of the front cab door with spring loaded retractable arms. The flat glass and convex glass shall be heated and adjustable with remote control within reach of the driver.

**DOORS**

To enhance entry and egress to the cab, the forward cab doors shall be a minimum of 37.50" wide x 61.75" high. The crew cab doors shall be located on the sides of the cab and shall be constructed in the same manner as the forward cab doors. The crew cab doors shall measure a minimum of 34.88" wide x 71.75" high. The forward cab and crew cab doors shall be constructed of extruded aluminum with a nominal material thickness of 0.125". The exterior door skins shall be constructed from 0.090" aluminum. A flush mounted, chrome plated paddle type door handle shall be provided on the exterior of each cab door. Each door shall also be provided with an interior flush paddle handle. The cab doors shall be provided with both interior (rotary knob) and exterior (keyed) locks as required by FMVSS 206. The locks shall be capable of activating when the doors are open or closed. The doors shall remain locked if locks are activated when the doors are opened, then closed.

A full length, heavy duty, stainless steel, piano-type hinge with a 0.38" pin and 11-gauge leaf shall be provided on all cab doors. There shall be double automotive-type rubber seals around the perimeter of the door framing and door edges to ensure a weathertight fit. A chrome grab handle shall be provided on the inside of each cab and crew cab door. The cab steps at each door location shall be located below the cab doors and shall be exposed to the exterior of the cab.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

<p><b><u>DOOR PANELS</u></b>          There shall be a full height brushed stainless steel door panel installed on the inside of all cab doors. The cab door panels shall be removable without disconnecting door and window mechanisms.</p> <p><b><u>MANUAL CAB DOOR WINDOWS</u></b>          All cab entry doors shall contain a conventional roll down window.</p> <p><b><u>CAB STEPS</u></b>          The forward cab and crew cab access steps shall be a full size two (2) step design to provide largest possible stepping surfaces for safe ingress and egress. The bottom steps shall be designed with a grip pattern punched into bright aluminum treadplate material to provide support, slip resistance, and drainage. The bottom steps shall be a bolt-in design to minimize repair costs should they need to be replaced. The forward cab steps shall be a minimum 24.75" wide, and the crew cab steps shall be 21.25" wide with an 8.00" minimum depth. The inside cab steps shall not exceed 18.00" in height and be limited to two (2) steps. Three (3) step entrance designs shall not be acceptable due to safety concerns. A slip-resistant handrail shall be provided adjacent to each cab door opening to assist during cab ingress and egress.</p> <p><b><u>STEP LIGHTS</u></b>          For reduced overall maintenance costs compared to incandescent lighting, there shall be four (4) white LED step lights provided. The lights shall be installed at each cab and crew cab door, one (1) per step. The lights shall be located in the driver side front doorstep, driver side crew cab doorstep, passenger side front doorstep and passenger side crew cab doorstep. In order to ensure exceptional illumination, each light shall 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 lights shall be activated when the adjacent door is opened.</p> <p><b><u>FENDER CROWNS</u></b>          Stainless steel fender crowns shall be installed at the cab wheel openings. The fender crowns shall have a radius outside corner that allows the fender crown to extend beyond the side wall of the front tires and also allow the crew cab doors to open fully.</p> <p><b><u>CREW CAB WINDOWS</u></b>          One (1) fixed window with tinted glass shall be provided on each side of the cab, to the rear of the front cab door. The windows shall be sized to enhance light penetration into the cab interior. The windows shall measure 17.50" wide x 21.00" high. Windows shall also be provided along the front of the raised roof section of the cab. Two (2) windows in the</p>	
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**II. Minimum Specifications:**

Bidder Complies	
Yes	No

slanted portion of the roof, each measuring 32.00" wide x 7.50" high. The rear wall of the crew cab shall have two (2) windows, each being 11.29" wide x 17.95" high.

**MOUNTING SYSTEM**

There shall be one (1) section(s) of equipment mounting systems located the back wall of the crew cab, on each outboard side of the forward facing seats.

Mounts shall be certified to meet the latest NFPA requirements for mounting of equipment inside the cab.

**CAB INTERIOR**

The left and right side dash and center console shall be a flat faced design to provide easy maintenance and shall be constructed out of painted aluminum.

The engine tunnel shall be padded and covered with 46 ounce leather grain vinyl resistant to oil, grease and mildew. The headliner shall be installed in both forward and rear cab sections. Headliner material shall be vinyl. A sound barrier shall be part of its composition. Material shall be installed on aluminum sheet and securely fastened to interior cab ceiling. Forward portion of cab headliner shall provide easy access for servicing electrical wiring or for other maintenance needs without removing the entire unit.

**CAB INTERIOR UPHOLSTERY**

The cab interior upholstery shall be maroon w/ black spatter.

**CAB INTERIOR PAINT**

The cab interior metal surfaces shall be painted black, vinyl texture paint.

**CAB FLOOR**

The cab and crew cab floor areas shall be covered with floor mat consisting of a black pyramid rubber facing and closed cell foam decoupler. 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, for no water absorption, which offers a sound dampening material for reducing sound levels.

**CAB DEFROSTER**

There shall be a 41,000 BTU defroster in the cab located under the engine tunnel. The defroster ventilation shall be built into the design of the cab dash instrument panel and shall be easily removable for maintenance. The defroster shall have a 3-speed blower and temperature controls accessible to the driver and officer. The defroster ducts shall be designed to provide maximum defrosting capabilities for the front cab windows.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

**CAB/CREW CAB HEATER**

Two (2) auxiliary heaters with 32,000 BTU each shall be provided in the cab. The heaters shall have a 3-speed blower and temperature controls accessible to the driver and officer. There shall also be louvers located below the rear facing seat riser and below the driver and officer positions for airflow.

The heaters shall be mounted, one (1) within each rear facing seat riser.

**AIR CONDITIONING**

A high-performance, customized air conditioning system shall be furnished inside the cab and crew cab. A 19.10 cubic inch compressor shall be installed on the engine. The air conditioning system shall be capable of cooling the average cab temperature from 100 degrees Fahrenheit to 72 degrees Fahrenheit at 50 percent relative humidity within 30 minutes. The cooling performance test shall be run only after the cab has been heat soaked at 100 degrees Fahrenheit for a minimum of 4 hours. A roof-mounted condenser that meets and exceeds the performance specification shall be installed on the cab roof.

Mounting the condenser below the cab or body would reduce the performance of the system and shall not be acceptable. An evaporator unit that meets and exceeds the performance specification shall be installed in the cab, located in the center of the cab ceiling over the engine tunnel. The evaporator shall include two (2) high performance cores and plenums with multiple outlets, one (1) plenum directed to the front and one (1) plenum directed to the rear of the cab. The evaporator unit shall be provided with adjustable air outlets strategically located to direct air flow to the driver, officer and crew cab area. All hose used shall be class 1 type to reduce moisture ingress into the air conditioning system. The air conditioner refrigerant shall be R-134A and shall be installed by a certified technician. The air conditioner shall be controlled by a single electronic control panel. For ease of operation, the control panel shall include variable adjustment for temperature and fan control and be conveniently located on the dash in clear view of the driver. The control panel shall include robust knobs for both fan speed and temperature adjustment.

**GRAVITY DRAIN TUBES**

Two (2) condensate drain tubes shall be provided for the air conditioning evaporator. The drip pan shall have two (2) drain tubes plumbed separately to allow for the condensate to exit the drip pan. The standard evaporator pumps shall be disabled.

**SUN VISORS**

Two (2) smoked polycarbonate sun visors provided. The sun visors shall be located above the windshield with one (1) mounted on each side of the cab.

There shall be no retention bracket provided to help secure each sun visor in the stowed position.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

**GRAB HANDLE**

A black rubber covered grab handle shall be mounted on the lower portion of the driver's side cab entrance to assist in entering the cab. The grab handle shall be securely mounted to the post area between the door and steering wheel column.

A long rubber grab handle shall be mounted on the dash board in front of the officer.

**ENGINE COMPARTMENT LIGHTS**

There shall be one (1) 12 volt DC, 3.00" white LED light(s) with chrome flange kit(s) installed under the cab to be used as engine compartment illumination.

These light(s) shall be activated automatically when the cab is raised.

**ACCESS TO ENGINE DIPSTICKS**

For access to the engine oil and transmission fluid dipsticks, there shall be a door on the engine tunnel, inside the crew cab. The door shall be on the rear wall of the engine tunnel, on the vertical surface. The engine oil dipstick shall allow for checking only. The transmission dipstick shall allow for both checking and filling.

The door shall have a rubber seal for thermal and acoustic insulation. One (1) flush latch shall be provided on the access door.

**CAB SAFETY SYSTEM**

The cab shall be provided with a safety system designed to protect occupants in the event of a side roll or frontal impact, and shall include the following:

- A supplemental restraint system (SRS) sensor shall be installed on a structural cab member behind the instrument panel. The SRS sensor shall perform real time diagnostics of all critical subsystems and shall record sensory inputs immediately before and during a side roll or frontal impact event.
- A slave SRS sensor shall be installed in the cab to provide capacity for eight (8) crew cab seating positions.
- A fault-indicating light shall be provided on the vehicle's instrument panel allowing the driver to monitor the operational status of the SRS system.
- A driver side front air bag shall be mounted in the steering wheel and shall be designed to protect the head and upper torso of the occupant, when used in combination with the 3-point seat belt.
- A passenger side knee bolster air bag shall be mounted in the modesty panel below the dash panel and shall be designed to protect the legs of the occupant, when used in combination with the 3-point seat belt.
- Air curtains shall be provided in the outboard bolster of outboard seat backs to provide a cushion between occupant and the cab wall.
- Suspension seats shall be provided with devices to retract them to the lowest travel position during a side roll or frontal impact event.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

Seat belts shall be provided with pre-tensioners to remove slack from the seat belt during a side roll or frontal impact event.

**FRONTAL IMPACT PROTECTION**

The SRS system shall provide protection during a frontal or oblique impact event. The system shall activate when the vehicle decelerates at a predetermined G force known to cause injury to the occupants. The cab and chassis shall 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 shall activate the pyrotechnic devices when the correct crash algorithm, wave form, is detected (no exception). The SRS system shall deploy the following components in the event of a frontal or oblique impact event:

- Driver side front air bag
- Passenger side knee bolster air bag
- Air curtains mounted in the outboard bolster of outboard seat backs
- Suspension seats shall be retracted to the lowest travel position
- Seat belts shall be pre-tensioned to firmly hold the occupant in place

**SIDE ROLL PROTECTION**

The SRS system shall 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 shall analyze the vehicle's angle and rate of roll to determine the optimal activation of the advanced occupant restraints.

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

- Air curtains mounted in the outboard bolster of outboard seat backs
- Suspension seats shall be retracted to the lowest travel position
- Seat belts shall be pre-tensioned to firmly hold the occupant in place

**SEATING CAPACITY**

The seating capacity in the cab shall be six (6).

**DRIVER SEAT**

A seat shall be provided in the cab for the driver. The seat design shall be a cam action type, with air suspension. For increased convenience, the seat shall include a manual control to adjust the horizontal position (6.00" travel). The manual horizontal control shall be a towel-bar style located below the forward part of the seat cushion. To provide flexibility for multiple driver configurations, the seat shall have an adjustable reclining back. The seat back shall be a high back style with side bolster pads for maximum support. For

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

optimal comfort, the seat shall be provided with 17.00" deep foam cushions designed with EVC (elastomeric vibration control).

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

- Side air curtain shall be mounted integral to the outboard bolster of the seat back. The air curtain shall be covered by a decorative panel when in the stowed position.
- A suspension seat safety system shall be included. When activated in the event of a side roll, this system shall pretension the seat belt and retract the seat to its lowest travel position. The seat shall be furnished with a 3-point, shoulder type seat belt. The seat belt tongue shall be stored at waist position for quick application by the seat occupant. The seat belt receptacle shall be provided on a cable conveniently nested next to the seat cushion, providing easy accessibility. The seat belt shall be furnished with dual automatic retractors that shall provide ease of operation in the normal seating position.

**OFFICER SEAT**

A seat shall be provided in the cab for the passenger. The seat shall be a fixed type, with no suspension. For optimal comfort, the seat shall be provided with 17.00" deep foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat shall be equipped with seat belt sensors in the seat cushion and belt receptacle that shall activate an alarm indicating a seat is occupied but not buckled. The seat back shall be an SCBA back style with 5 degree fixed recline angle. The SCBA cavity shall be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity shall be accomplished by unbolting, relocating, and re-bolting it in the desired location.

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

- Side air curtain shall be mounted integral to the outboard bolster of the seat back. The air curtain shall be covered by a decorative panel when in the stowed position.
- A seat safety system shall be included. When activated, this system shall pretension the seat belt.

The seat shall be furnished with a 3-point, shoulder type seat belt. The seat belt tongue shall be stored at waist position for quick application by the seat occupant. The seat belt receptacle shall be provided on a cable conveniently nested next to the seat cushion, providing easy accessibility. The seat belt shall be furnished with dual automatic retractors that shall provide ease of operation in the normal seating position.

**RADIO COMPARTMENT**

A radio compartment shall be provided under the officer's seat. The inside compartment dimensions shall be 14.00" wide x 7.50" high x 14.50" deep. A drop-down door with a chrome plated lift and turn latch shall be provided for access. The compartment shall be constructed of smooth aluminum and painted to match the cab interior.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

**REAR FACING DRIVER SIDE OUTBOARD SEAT**

There shall be one (1) rear facing seat provided at the driver side outboard position in the crew cab. For optimal comfort, the seat shall be provided with 15.00" deep foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat shall be equipped with seat belt sensors in the seat cushion and belt receptacle that shall activate an alarm indicating a seat is occupied but not buckled. The seat back shall be an SCBA back style with 5 degree fixed recline angle. The SCBA cavity shall be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity shall be accomplished by unbolting, relocating, and re-bolting it in the desired location.

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

- Side air curtain shall be mounted integral to the outboard bolster of the seat back. The air curtain shall be covered by a decorative panel when in the stowed position.
- A seat safety system shall be included. When activated this system shall pretension the seat belt around the occupant to firmly hold them in place in the event of a side roll. The seat shall be furnished with a 3-point, shoulder type seat belt. The seat belt tongue shall be stored at waist position for quick application by the seat occupant. The seat belt receptacle shall be provided on a cable conveniently nested next to the seat cushion, providing easy accessibility. The seat belt shall be furnished with dual automatic retractors that shall provide ease of operation in the normal seating position.

**REAR FACING PASSENGER SIDE OUTBOARD SEAT**

There shall be one (1) rear facing seat provided at the passenger side outboard position in the crew cab. For optimal comfort, the seat shall be provided with 15.00" deep foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat shall be equipped with seat belt sensors in the seat cushion and belt receptacle that shall activate an alarm indicating a seat is occupied but not buckled. The seat back shall be an SCBA back style with 5 degree fixed recline angle. The SCBA cavity shall be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity shall be accomplished by unbolting, relocating, and re-bolting it in the desired location.

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

- Side air curtain shall be mounted integral to the outboard bolster of the seat back. The air curtain shall be covered by a decorative panel when in the stowed position.
- A seat safety system shall be included. When activated this system shall pretension the seat belt around the occupant to firmly hold them in place in the event of a side roll. The seat shall be furnished with a 3-point, shoulder type seat belt. The seat belt tongue shall be stored at waist position for quick application by the seat occupant. The seat belt receptacle shall be provided on a cable conveniently nested next to the seat cushion, providing easy

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

accessibility. The seat belt shall be furnished with dual automatic retractors that shall provide ease of operation in the normal seating position.

**FORWARD FACING CENTER SEATS**

There shall be two (2) forward facing seats provided at the center position in the crew cab. For optimal comfort, the seats shall be provided with 15.00" deep foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seats shall be equipped with seat belt sensors in the seat cushion and belt receptacle that shall activate an alarm indicating a seat is occupied but not buckled. The seat backs shall be an SCBA style with 90 degree back. The SCBA cavity shall be adjustable from front to rear in 1.00" increments to accommodate different sized SCBA cylinders. Moving the SCBA cavity shall be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seats shall include the following feature incorporated into the side roll protection system:

A seat safety system shall be included. When activated, this system shall pretension the seat belts around the occupants to firmly hold them in place in the event of a side roll.

The seats shall be furnished with 3-point shoulder type seat belts. The seat belt tongue shall be stored at waist position for quick application by the seat occupant. The seat belt receptacle shall be provided on a cable conveniently nested next to the seat cushion, providing easy accessibility. The seat belts shall be furnished with dual automatic retractors that shall provide ease of operation in the normal seating position.

**SEAT UPHOLSTERY**

All seat upholstery shall be maroon woven with black water resistant material.

**AIR BOTTLE HOLDERS**

All SCBA type seats in the cab shall have a "Hands-Free" auto clamp style bracket in its backrest. For efficiency and convenience, the bracket shall include an automatic spring clamp that allows the occupant to store the SCBA bottle by simply pushing it into the seat back. For protection of all occupants in the cab, in the event of an accident, the inertial components within the clamp shall constrain the SCBA bottle in the seat and shall exceed the NFPA standard of 9G. Bracket designs with manual restraints (belts, straps, buckles) that could be inadvertently left unlocked and allow the SCBA to move freely within the cab during an accident, shall not be acceptable.

There shall be a quantity of five (5) SCBA brackets.

**SEAT BELTS**

All seating positions in the cab and crew cab shall have red seat belts.

The belts shall also include a D-loop assembly to the shoulder belt system. This feature adds an extender arm to the D-loop location placing the D-loop in a closer, easier to reach location.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

**SHOULDER HARNESS HEIGHT ADJUSTMENT**

All seating positions furnished with 3-point shoulder type seat belts shall include a height adjustment. This adjustment shall optimize the belts effectiveness and comfort for the seated firefighter.

**SEAT BELT MONITORING SYSTEM**

A seat belt monitoring system (SBMS) shall be provided. The SBMS shall be capable of monitoring up to ten (10) seat positions indicating the status of each seat position with a green or red LED indicator as follows:

- Seat Occupied & Buckled = Green
- Seat Occupied & Unbuckled = Red
- No Occupant & Buckled = Red
- No Occupant & Unbuckled = Not Illuminated

**Audible Alarm**

The SBMS shall include an audible alarm that shall be activated when a red illumination condition exists and the parking brake is released, or a red illumination condition exists and the transmission is not in park.

**HELMET STORAGE, PROVIDED BY FIRE DEPARTMENT**

NFPA 1901, 2009 edition, section 14.1.8.4.1 requires a location for helmet storage be provided. There is no helmet storage on the apparatus as manufactured. The fire department shall provide a location for storage of helmets.

**CAB DOME LIGHTS**

There shall be four (4) dual LED dome lights with grey bezels provided. Two (2) lights shall be mounted above the inside shoulder of the driver and officer and two (2) lights shall be installed and located, one (1) on each side of the crew cab.

The color of the LED's shall be red and white. The white LED's shall be controlled by the door switches and the lens switch. The color LED's shall be controlled by the lens switch. In order to ensure exceptional illumination, each white LED dome light shall provide a minimum of 10.1 foot-candles (fc) covering an entire 20.00" x 20.00" square seating position when mounted 40.00" above the seat.

**PORTABLE HAND LIGHTS, PROVIDED BY FIRE DEPARTMENT**

NFPA 1901, 2009 edition, section 5.8.3 requires two portable hand lights mounted in brackets fastened to the apparatus. The hand lights are not on the apparatus as manufactured. The fire department shall provide and mount these hand lights.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

**CAB INSTRUMENTATION**

The cab instrument panel shall consist of gauges, an LCD display, telltale indicator lights, alarms, control switches, and a diagnostic panel. The function of instrument panel controls and switches shall be identified by a label adjacent to each item. Actuation of the headlight switch shall illuminate the labels in low light conditions. Telltale indicator lamps shall not be illuminated unless necessary. The cab instruments and controls shall be conveniently located within the forward cab section directly forward of the driver. Gauge and switch panels shall be designed to be removable for ease of service and low cost of ownership.

**CAB INTERIOR**

The wrap-around style high impact ABS plastic cab dash fascia shall be designed to provide unobstructed visibility to instrumentation. The dash layout shall provide the driver with a quick reference to gauges that allows more time to focus on the road.

**GAUGES**

The gauge panel shall include the following ten (10) black gauges with black bezels to monitor vehicle performance:

- Voltmeter Gauge (Volts)
  - o Low volts (11.8 VDC)
    - § Amber indicator on gauge assembly with alarm
  - o High volts (15 VDC)
    - § Amber indicator on gauge assembly with alarm
  - o Very low volts (11.3 VDC)
    - § Amber indicator on gauge assembly with alarm
  - o Very high volts (16 VDC)
    - § Amber indicator on gauge assembly with alarm
- Tachometer (RPM)
- Speedometer (Primary (outside) MPH, Secondary (inside) Km/H)
- Fuel Level Gauge (Empty - Full in fractions)
  - o Low fuel (1/8 full)
    - § Amber indicator on gauge assembly with alarm
  - o Very low fuel (1/32) fuel
    - o Amber indicator on gauge assembly with alarm
- Engine Oil Pressure Gauge (PSI)
  - o Low oil pressure to activate engine warning lights and alarms
    - § Red indicator on gauge assembly with alarm
- Front Air Pressure Gauge (PSI)
  - o Low air pressure to activate warning lights and alarm
    - § Red indicator on gauge assembly with alarm
- Rear Air Pressure Gauge (PSI)

**II. Minimum Specifications:**

**Bidder Complies**

**Yes**

**No**

- Low air pressure to activate warning lights and alarm
  - § Red indicator on gauge assembly with alarm
  - Transmission Oil Temperature Gauge (Fahrenheit)
  - High transmission oil temperature activates warning lights and alarm
  - § Amber indicator on gauge assembly with alarm
  - Engine Coolant Temperature Gauge (Fahrenheit)
  - High engine temperature activates an engine warning light and alarm
  - § Red indicator on gauge assembly with alarm
  - Diesel Exhaust Fluid Level Gauge (Empty - Full in fractions)
  - Low fluid (1/8 full)
  - § Amber indicator on gauge assembly with alarm
- All gauges and gauge indicators shall perform prove out at initial power-up to ensure proper performance.

**INDICATOR LAMPS**

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

The following amber telltale lamps shall be present:

- Low coolant
- Trac cntl (traction control) (where applicable)
- Check engine
- Check trans (check transmission)
- Aux brake overheat (Auxiliary brake overheat)
- Air rest (air restriction)
- Caution (triangle symbol)
- Water in fuel
- DPF (engine diesel particulate filter regeneration)
- Trailer ABS (where applicable)
- Wait to start (where applicable)
- HET (engine high exhaust temperature) (where applicable)
- ABS (antilock brake system)
- MIL (engine emissions system malfunction indicator lamp) (where applicable)
- SRS (supplemental restraint system) fault (where applicabl
- DEF (low diesel exhaust fluid level)

The following red telltale lamps shall be present:

- Warning (stop sign symbol)
- Seat belt
- Parking brake

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

- Stop engine
  - Rack down
- The following green telltale lamps shall be provided:
- Left turn
  - Right turn
  - Battery on
- The following blue telltale lamp shall be provided:
- High beam

**ALARMS**

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

Alarm silence: Any active current audible alarm shall be able to be silence by depressing the alarm silence button on the MUX display. Any new warning or caution condition shall enable a steady or pulsing tones respectively even if the alarm silence button has been previously depressed. The system shall go back to normal operation when the ignition switch is cycled. Any active audible alarm shall be able to be silence by holding the ignition switch at the top position for three (3) to five (5) seconds. For improved safety, silenced audible alarms shall intermittently chirp every 30 seconds until the alarm condition no longer exists. The intermittent chirp shall act as a reminder to the operator that a caution or warning condition still exists. Any new warning or caution condition shall enable the steady or pulsing tones respectively.

**INDICATOR LAMP AND ALARM PROVE-OUT**

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

**CONTROL SWITCHES**

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

- Emergency master switch: A molded plastic push button switch with integral indicator lamp shall be provided. Pressing the switch shall 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.
- Headlight / Parking light switch: A three (3)-position maintained rocker switch shall be provided. The first switch position shall deactivate all parking lights and the headlights. The second switch position shall activate the parking lights. The third switch position shall activate the headlights.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

<p><input type="checkbox"/> Panel back lighting intensity control switch: A three (3)-position momentary rocker switch shall be provided. The first switch position decreases the panel back lighting intensity to a minimum level as the switch is held. The second switch position is the default position that does not affect the back lighting intensity. The third switch position increases the panel back lighting intensity to a maximum level as the switch is held. The following standard controls shall be integral to the gauge assembly and are located below the right hand gauges. All switches have backlit labels for low light applications.</p> <p><input type="checkbox"/> High idle engagement switch: A two (2)-position momentary rocker switch with integral indicator lamp shall be provided. The first switch position is the default switch position. The second switch position shall 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 shall indicate when the high idle function is engaged.</p> <p><input type="checkbox"/> "Ok To Engage High Idle" indicator lamp: A green indicator light shall be provided next to the high idle activation switch to indicate that the interlocks have been met to allow high idle engagement.</p> <p>The following standard controls shall be provided adjacent to the cab gauge assembly within easy reach of the driver. All switches shall have backlit labels for low light applications.</p> <p><input type="checkbox"/> Ignition switch: A three (3)-position maintained/momentary rocker switch shall be provided. The first switch position shall deactivate vehicle ignition. The second switch position shall activate vehicle ignition. The third momentary position shall disable the Command Zone audible alarm if held for three (3) to five (5) seconds. A green indicator lamp shall be activated with vehicle ignition.</p> <p><input type="checkbox"/> Engine start switch: A two (2)-position momentary rocker switch shall be provided. The first switch position is the default switch position. The second switch position shall activate the vehicle's engine. The switch actuator is designed to prevent accidental activation.</p> <p><input type="checkbox"/> 4-way hazard switch: A two (2)-position maintained rocker switch shall be provided. The first switch position shall deactivate the 4-way hazard switch function. The second switch position shall activate the 4-way hazard function. The switch actuator shall be red and includes the international 4-way hazard symbol.</p> <p>Turn signal arm: A self-canceling turn signal with high beam headlight and windshield wiper/washer controls shall be provided. The windshield wiper control shall have high, low, and intermittent modes. Parking brake control: An air actuated push/pull park brake control valve shall be provided. Chassis horn control: Activation of the chassis horn control shall be provided through the center of the steering wheel.</p>	
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**II. Minimum Specifications:**

Bidder Complies	
Yes	No

**CUSTOM SWITCH PANELS**

The design of cab instrumentation shall allow for emergency lighting and other switches to be placed within easy reach of the operator thus improving safety. There shall be positions for up to three (3) 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 three (3) switch panels in the overhead console on the officer's side and up to three (3) switch panels in the engine tunnel rear facing console accessible to both driver and officer. All switches shall have backlit labels for low light applications.

**DIAGNOSTIC PANEL**

A diagnostic panel shall be accessible while standing on the ground and located inside the driver's side door left of the steering column. The diagnostic panel shall allow diagnostic tools such as computers to connect to various vehicle systems for improved troubleshooting providing a lower cost of ownership. Diagnostic switches shall allow engine and ABS systems to provide blink codes should a problem exist. The diagnostic panel shall include the following:

- Engine diagnostic port
- Transmission diagnostic port
- ABS diagnostic port
- SRS diagnostic port (where applicable)
- Command Zone USB diagnostic port
- Engine diagnostic switch (blink codes flashed on check engine telltale indicator)
- ABS diagnostic switch (blink codes flashed on ABS telltale indicator)
- Diesel particulate filter regeneration switch (where applicable)
- Diesel particulate filter regeneration inhibit switch (where applicable)

**CAB LCD DISPLAY**

A digital four (4)-row by 20-character dot matrix display shall be integral to the gauge panel. The display shall be capable of showing simple graphical images as well as text. The display shall be split into three (3) sections. Each section shall have a dedicated function. The upper left section shall display the outside ambient temperature. The upper right section shall display odometer, trip mileage, PTO hours, fuel consumption, engine hours, and other configuration specific information. The bottom section shall display INFO, CAUTION, and WARNING messages. Text messages shall automatically activate to describe the cause of an audible caution or warning alarm. The LCD shall be capable of displaying multiple text messages should more than one caution or warning condition exist.

**AIR RESTRICTION INDICATOR**

A high air restriction warning indicator light LCD message with amber warning indicator and audible alarm shall be provided.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

<p><b><u>"DO NOT MOVE APPARATUS" INDICATOR</u></b></p> <p>There shall be a flashing red LED indicator light located in the driving compartment. The light shall be illuminated automatically per the current NFPA requirements and labeled "Do Not Move Apparatus If Light Is On". The same circuit that activates the Do Not Move Apparatus indicator shall activate a steady tone alarm when the parking brake is released.</p> <p><b><u>DO NOT MOVE TRUCK MESSAGES</u></b></p> <p>Messages shall be displayed on the color display located within sight of the driver whenever the Do Not Move Truck light is active. The messages shall designate the item or items not in the stowed for vehicle travel position (parking brake disengaged). The following messages shall be displayed (where applicable):</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Do Not Move Truck</li> <li><input type="checkbox"/> DS Cab Door Open (Driver Side Cab Door Open)</li> <li><input type="checkbox"/> PS Cab Door Open (Passenger's Side Cab Door Open)</li> <li><input type="checkbox"/> DS Crew Cab Door Open (Driver Side Crew Cab Door Open)</li> <li><input type="checkbox"/> PS Crew Cab Door Open (Passenger's Side Crew Cab Door Open)</li> <li><input type="checkbox"/> DS Body Door Open (Driver Side Body Door Open)</li> <li><input type="checkbox"/> PS Body Door Open (Passenger's Side Body Door Open)</li> <li><input type="checkbox"/> Rear Body Door Open</li> <li><input type="checkbox"/> DS Ladder Rack Down (Driver Side Ladder Rack Down)</li> <li><input type="checkbox"/> PS Ladder Rack Down (Passenger Side Ladder Rack Down)</li> <li><input type="checkbox"/> Deck Gun Not Stowed</li> <li><input type="checkbox"/> Lt Tower Not Stowed (Light Tower Not Stowed)</li> <li><input type="checkbox"/> Hatch Door Open</li> <li><input type="checkbox"/> Fold Tank Not Stowed (Fold-A-Tank Not Stowed)</li> <li><input type="checkbox"/> Aerial Not Stowed (Aerial Device Not Stowed)</li> <li><input type="checkbox"/> Stabilizer Not Stowed</li> <li><input type="checkbox"/> Steps Not Stowed</li> <li><input type="checkbox"/> Handrail Not Stowed</li> </ul> <p>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 shall be displayed as a caution message after the parking brake is disengaged.</p> <p><b><u>SWITCH PANELS</u></b></p> <p>The emergency light switch panel shall have a master switch for ease of use plus individual switches for selective control. Each switch panel shall contain eight (8) membrane-type switches each rated for one million (1,000,000) cycles. Panels containing less than eight (8) switch assignments shall include non-functioning black appliqué. Documentation shall be provided by the manufacturer indicating the rated cycle life of the switches. The switch panel(s) shall be located in the overhead position above the windshield on the driver side overhead to allow for easy access.</p>	
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**II. Minimum Specifications:**

Bidder Complies	
Yes	No

The switches shall be membrane-type and also act as an integral indicator light. For quick, visual indication the entire surface of the switch shall be illuminated white whenever back lighting is activated and illuminated green whenever the switch is active. For ease of use, a two (2)-ply, scratch resistant laser engraved label indicating the use of each switch shall be placed in the center of the switch. The label shall allow light to pass through the letters for ease of use in low light conditions.

**WIPER CONTROL**

For simple operation and easy reach, the windshield wiper control shall be an integral part of the directional light lever located on the steering column. The wiper control shall include high and low wiper speed settings, a one (1)-speed intermittent wiper control and windshield washer switch. The control shall have a "return to park" provision, which allows the wipers to return to the stored position when the wipers are not in use.

**SPARE CIRCUIT**

There shall be two (2) pair of wires, including a positive and a negative, installed on the apparatus.

The above wires shall have the following features:

- The positive wire shall be connected directly to the battery power
- The negative wire shall be connected to ground
- Wires shall be protected to 15 amps at 12 volts DC
- Power and ground shall terminate officer side dash area and with two (2) sets on the officer's side engine tunnel
- Termination shall be with 15 amp, power point plug with rubber cover
- Wires shall be sized to 125 percent of the protection

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

**SWIVEL MOUNT**

There shall be one (1) heavy duty swivel mount bracket(s) provided for the fire department's electronic siren control head equipment. The swivel mount bracket(s) shall be located behind the windshield, in the center of the cab, hung from the ceiling.

**INFORMATION CENTER**

An information center employing a 7.00" diagonal touch screen color LCD display shall be encased in an ABS plastic housing.

The information center shall have the following specifications:

- Operate in temperatures from -40 to 185 degrees Fahrenheit
- An Optical Gel shall be placed between the LCD and protective lens
- Five weather resistant user interface switches
- Grey with black accents
- Sunlight Readable

**II. Minimum Specifications:**

**Bidder Complies**

**Yes      No**

- Linux operating system
- Minimum of 1000nits rated display
- Display can be changed to an available foreign language
- A LCD display integral to the cab gauge panel shall be included as outlined in the cab instrumentation area.
- Programmed to read US Customary

**GENERAL SCREEN DESIGN**

Where possible, background colors shall be used to provide "At a Glance" vehicle information. If information provided on a screen is within acceptable limits, a green background shall be used.

If a caution or warning situation arises the following shall occur:

- An amber background/text color shall indicate a caution condition
- A red background/text color shall indicate a warning condition
- The information center shall utilize an "Alert Center" to display text messages for audible alarm tones. The text messages shall be written to identify the item(s) causing the audible alarm to sound. If more than one (1) text message occurs, the messages shall cycle every second until the problem(s) have been resolved.

The background color for the "Alert Center" shall change to indicate the severity of the "warning" message. If a warning and a caution condition occur simultaneously, the red background color shall be shown for all alert center messages.

- A label for each button shall exist. The label shall indicate the function for each active button for each screen. Buttons that are not utilized on specific screens shall have a button label with no text or symbol.

**HOME/TRANSIT SCREEN**

This screen shall display the following:

- Vehicle Mitigation (if equipped)
- Water Level (if equipped)
- Foam Level (if equipped)
- Seat Belt Monitoring Screen
- Tire Pressure Monitoring (if equipped)
- Digital Speedometer
- Active Alarms

**ON SCENE SCREEN**

This screen shall display the following and shall be auto activated with pump engaged (if equipped):

- Battery Voltage
- Fuel
- Oil Pressure

**II. Minimum Specifications:**

**Bidder Complies**

**Yes      No**

- Coolant Temperature
- RPM
- Water Level (if equipped)
- Foam Level (if equipped)
- Foam Concentration (if equipped)
- Water Flow Rate (if equipped)
- Water Used (if equipped)
- Active Alarms

**VIRTUAL BUTTONS**

There shall be four (4) virtual switch panel screens that match the overhead and lower lighting and HVAC switch panels.

**PAGE SCREEN**

The page screen shall display the following and allow the user to progress into other screens for further functionality:

- Diagnostics
  - o Faults
    - § Listed by order of occurrence
    - § Allows to sort by system
  - o Interlock
    - § Throttle Interlocks
    - § Pump Interlocks (if equipped)
    - § Aerial Interlocks (if equipped)
    - § PTO Interlocks (if equipped)
  - o Load Manager
    - § A list of items to be load managed shall be provided. The list shall provide a description of the load.
    - § The lower the priority numbers the earlier the device shall be shed should a low voltage condition occur.
    - § The screen shall indicate if a load has been shed (disabled) or not shed.
    - § "At a glance" color features are utilized on this screen.
- o Systems
  - § Command Zone
    - Module type and ID number
    - Module Version
    - Input or output number
    - Circuit number connected to that input or output
    - Status of the input or output
    - Power and Constant Current module diagnostic information

**II. Minimum Specifications:**

**Bidder Complies**

**Yes      No**

- § Foam (if equipped)
- § Pressure Controller (if equipped)
- § Generator Frequency (if equipped)
  - Live Data
- § General Truck Data
  - Maintenance
    - Engine oil and filter
    - Transmission oil and filter
    - Pump oil (if equipped)
    - Foam (if equipped)
    - Aerial (if equipped)
  - Setup
    - Clock Setup
    - Date & Time
- § 12 or 24 hour format
- § Set time and date
  - Backlight
- § Daytime
- § Night time
- § Sensitivity
  - Unit Selection
  - Home Screen
  - Virtual Button Setup
  - On Scene Screen Setup
  - Configure Video Mode
- § Set Video Contrast
- § Set Video Color
- § Set Video Tint
- Do Not Move
  - The screen shall indicate the approximate location and type of item that is open or is not stowed for travel. The actual status of the following devices shall be indicate:
- § Driver Side Cab Door
- § Passenger's Side Cab Door
- § Driver Side Crew Cab Door
- § Passenger's Side Crew Cab Door
- § Driver Side Body Doors
- § Passenger's Side Body Doors
- § Rear Body Door(s)
- § Ladder Rack (if applicable)

**II. Minimum Specifications:**

**Bidder Complies**

**Yes      No**

§ Deck Gun (if applicable)  
 § Light Tower (if applicable)  
 § Hatch Door (if applicable)  
 § Stabilizers (if applicable)  
 § Steps (if applicable)  
 Notifications  
     ○ View Active Alarms  
 § Shows a list of all active alarms including date and time of the occurrence is shown with each alarm  
 § Silence Alarms - All alarms are silenced  
 Timer Screen  
 HVAC (if equipped)  
 Tire Information (if equipped)  
 Button functions and button labels may change with each screen.

**VEHICLE DATA RECORDER**

A vehicle data recorder (VDR) shall be provided. The VDR shall be capable of reading and storing vehicle information. The information stored on the VDR can be downloaded through a USB port mounted in a convenient location determined by cab model. A CD provided with the apparatus shall include the programming to download the information from the VDR. A USB cable can be used to connect the VDR to a laptop to retrieve required information. The vehicle data recorder shall be capable of recording the following data via hardwired and/or CAN inputs:

- Vehicle Speed - MPH
- Acceleration - MPH/sec
- Deceleration - MPH/sec
- Engine Speed - RPM
- Engine Throttle Position - % of Full Throttle
- ABS Event - On/Off
- Seat Occupied Status - Yes/No by Position (7-12 Seating Capacity)
- Seat Belt Buckled Status - Yes/No by Position (7-12 Seating Capacity)
- Master Optical Warning Device Switch - On/Off
- Time - 24 Hour Time
- Date - Year/Month/Day

**RADIO ANTENNA MOUNT**

There shall be two (2) standard 1.125", 18 thread antenna-mounting base(s) installed spaced evenly behind the light bar on the cab roof with high efficiency, low loss, coaxial cable(s) routed to behind the officer seat. A weatherproof cap shall be installed on the mount.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

**VEHICLE CAMERA SYSTEM**

There shall be a color vehicle camera system provided with the following:

- One (1) camera located at the rear of the apparatus, pointing rearward, displayed automatically with the vehicle in reverse
- One (1) camera located on the passenger side of the apparatus, pointing rearward, displayed automatically with the passenger side turn signal.

The camera images shall be displayed on the driver's color Mux display. Audio from the microphone on the rear camera shall be emitted by an amplified speaker with volume control located on the instrument panel.

**ELECTRICAL POWER CONTROL SYSTEM**

The primary power distribution shall 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 shall be provided throughout the vehicle to house the vehicle's electrical power, circuit protection, and control components. The electrical distribution centers shall be located strategically throughout the vehicle to minimize wire length. For ease of maintenance, all electrical distribution centers shall be easily accessible. All distribution centers containing fuses, circuit breakers and/or relays shall be easily accessible. Distribution centers located throughout the vehicle shall contain battery powered studs for supplying customer installed equipment thus providing a lower cost of ownership. Circuit protection devices, which conform to SAE standards, shall be utilized to protect electrical circuits. All circuit protection devices shall be rated per NFPA requirements to prevent wire and component damage when subjected to extreme current overload. General protection circuit breakers shall be Type-I automatic reset (continuously resetting). When required, automotive type fuses shall be utilized to protect electronic equipment. Control relays and solenoid shall have a direct current rating of 125 percent of the maximum current for which the circuit is protected per NFPA.

**SOLID-STATE CONTROL SYSTEM**

A solid-state electronics based control system shall be utilized to achieve advanced operation and control of the vehicle components. A fully computerized vehicle network shall consist of electronic modules located near their point of use to reduce harness lengths and improve reliability. The control system shall comply with SAE J1939-11 recommended practices. The control system shall operate as a master-slave system whereas the main control module instructs all other system components. The system shall contain patented Mission Critical software that maintains critical vehicle operations in the unlikely event of a main controller error. The system shall utilize a Real Time Operating System (RTOS) fully compliant with OSEK/VDX™ specifications providing a lower cost of ownership. For increased reliability and simplified use the control system modules shall include the following attributes:

**II. Minimum Specifications:**

**Bidder Complies**

**Yes      No**

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

**CIRCUIT PROTECTION AND CONTROL DIAGRAM**

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

**ON-BOARD ADVANCED/VISUAL ELECTRICAL SYSTEM DIAGNOSTICS**

The on-board information center shall include the following diagnostic information:

Text description of active warning or caution alarms  
 Simplified warning indicators  
 Amber caution indication with intermittent alarm  
 Red warning indication with steady tone alarm

All control system modules, with the exception of the main control module, shall contain on-board visual diagnostic LEDs that assist in troubleshooting. The LEDs shall be enclosed within the sealed, transparent module housing near the face of the module. One LED for each input or output shall be provided and shall illuminate whenever the respective input or

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

output is active. Color-coded labels within the modules shall encompass the LEDs for ease of identification. The LED indicator lights shall provide point of use information for reduced troubleshooting time without the need for an additional computer.

**TECH MODULE WITH WIFI**

An in cab module will provide Wifi wireless interface and data logging capability. (No Exception) The Wifi 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. The module will transmit a password protected web page to a wifi 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 control and information system. The data logging capability will record faults from the engine, transmission, ABS and 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. 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.

**PROGNOSTICS**

A software based vehicle tool shall be provided to predict remaining life of the vehicles critical fluid and events (no exceptions). The system shall send automatic indications to the color display and/or wireless enabled device to proactively alert of upcoming service intervals.

Prognostics shall include:

- Engine oil and filter
- Transmission oil and filter
- Pump oil (if equipped)
- Foam oil (if equipped)
- Aerial oil and filter (if equipped)

**ADVANCED DIAGNOSTICS**

An advanced, Windows-based, diagnostic software program shall be provided for this control system. The software shall provide troubleshooting tools to service technicians equipped with a Windows-based computer or wireless enabled device.

The service and maintenance software shall be easy to understand and use and have the ability to view system input/output (I/O) information.

**INDICATOR LIGHT AND ALARM PROVE-OUT SYSTEM**

A system shall be provided which automatically tests basic indicator lights and alarms located on the cab instrument panel.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

**VOLTAGE MONITOR SYSTEM**

A voltage monitoring system shall be provided to indicate the status of the battery system connected to the vehicle's electrical load. The system shall provide visual and audible warning when the system voltage is below or above optimum levels.

The alarm shall activate if the system falls below 11.8 volts DC for more than two (2) minutes.

**DEDICATED RADIO EQUIPMENT CONNECTION POINTS**

There shall be three (3) studs provided in the primary power distribution center located in front of the officer for two-way radio equipment.

The studs shall consist of the following:

12-volt 40-amp battery switched power

12-volt 60-amp ignition switched power

12-volt 60-amp direct battery power

There shall also be a 12-volt 100-amp ground stud located in or adjacent to the power distribution center.

**ENHANCED SOFTWARE**

The solid-state control system shall include the following software enhancements:

All perimeter lights and scene lights (where applicable) shall be deactivated when the parking brake is released. Cab and crew cab dome lights shall remain on for ten (10) seconds for improved visibility after the doors close. The dome lights shall dim after ten (10) seconds or immediately if the vehicle is put into gear. Cab and crew cab perimeter lights shall remain on for ten (10) seconds for improved visibility after the doors close. The dome lights shall dim after ten (10) seconds or immediately if the vehicle is put into gear.

**EMI/RFI PROTECTION**

To prevent erroneous signals from crosstalk contamination and interference, the electrical system shall meet, at a minimum, SAE J551/2, thus reducing undesired electromagnetic and radio frequency emissions. An advanced electrical system shall be used to ensure radiated and conducted electromagnetic interference (EMI) or radio frequency interference (RFI) emissions are suppressed at their source.

The apparatus shall have the ability to operate in the electromagnetic environment typically found in fire ground operations to ensure clean operations. The electrical system shall 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, shall provide EMC testing reports from testing conducted on an entire apparatus and shall 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. Component and partial (incomplete) vehicle testing is not adequate as overall vehicle design can impact test results and thus is not acceptable by itself. EMI/RFI susceptibility shall be controlled by applying appropriate circuit

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

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

**ELECTRICAL**

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

1. All holes made in the roof shall be caulked with silicon, rope caulk is not acceptable. Large fender washers, liberally caulked, shall be used when fastening equipment to the underside of the cab roof.
2. Any electrical component that is installed in an exposed area shall be mounted in a manner that shall not allow moisture to accumulate in it. Exposed area shall be defined as any location outside of the cab or body.
3. Electrical components designed to be removed for maintenance shall not be fastened with nuts and bolts. Metal screws shall be used in mounting these devices. Also a coil of wire shall be provided behind the appliance to allow them to be pulled away from mounting area for inspection and service work.
4. Corrosion preventative compound shall be applied to all terminal plugs located outside of the cab or body. All non-waterproof connections shall require this compound in the plug to prevent corrosion and for easy separation (of the plug).
5. All lights that have their sockets in a weather exposed area shall have corrosion preventative compound added to the socket terminal area.
6. All electrical terminals in exposed areas shall have silicon (1890) applied completely over the metal portion of the terminal. All lights and reflectors, required to comply with Federal Motor Vehicle Safety Standard #108, shall be furnished. Rear identification lights shall be recessed mounted for protection. Lights and wiring mounted in the rear bulkheads shall be protected from damage by installing a false bulkhead inside the rear compartments. An operational test shall be conducted to ensure that any equipment that is permanently attached to the electrical system is properly connected and in working order. The results of the tests shall be recorded and provided to the purchaser at time of delivery.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

**BATTERY SYSTEM**

There shall be six (6) 12 volt batteries that include the following features shall be provided:

- 950 CCA, cold cranking amps
- 190 amp reserve capacity
- High cycle
- Group 31
- Rating of 5700 CCA at 0 degrees Fahrenheit
- 140 minutes of reserve capacity
- Threaded stainless steel studs

Each battery case shall be a black polypropylene material with a vertically ribbed container for increased vibration resistance. The cover shall be manifold vented with a central venting location to allow a 45 degree tilt capacity. The inside of each battery shall consist of a "maintenance free" grid construction with poly wrapped separators and a flooded epoxy bottom anchoring for maximum vibration resistance.

**BATTERY SYSTEM**

There shall be a single starting system with an ignition switch and starter button provided and located on the cab instrument panel.

**MASTER BATTERY SWITCH**

There shall be a master battery switch provided within the cab within easy reach of the driver to activate the battery system. An indicator light shall be provided on the instrument panel to notify the driver of the status of the battery system.

**BATTERY COMPARTMENTS**

Batteries shall be stored in well-ventilated compartments that are located under the cab and bolted directly to the chassis frame. The battery compartments shall be constructed of painted 0.188" stainless steel plate and be designed to accommodate a maximum of three (3) group 31 batteries in each compartment. The battery hold-downs shall be of a non-corrosive material. All bolts and nuts shall be stainless steel. The compartments shall include formed fit heavy duty roto-molded polyethylene battery trays with drain tubes for the batteries to sit in.

Heavy-duty battery cables shall be used to provide maximum power to the electrical system. Cables shall be color-coded. Battery terminal connections shall be coated with anti-corrosion compound. Battery solenoid terminal connections shall be encapsulated with semi-permanent rubberized compound.

**JUMPER STUDS**

One (1) set of battery jumper studs with plastic color-coded covers shall be installed on the bottom of the driver's side battery box. This shall provide for easy jumper cable access.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

**BATTERY CHARGER**

There shall be a 40 amp battery charger with internal battery saver provided. Separate ammeters shall be provided on the charger to indicate charge and saver output. The battery saver circuit shall be capable of supplying up to 20 amps for external loads such as hand lights or auxiliary radio batteries. The battery charger shall be wired to the AC shoreline inlet through an AC inlet on the front of the battery charger. The battery charger shall be located in the cab.

**SHORELINE**

There shall be one (1) 15 amp 120 volt AC straight blade inlet(s) NEMA 5-15 with gray cover(s) provided to operate the dedicated 120 volt AC circuits on the apparatus. The shoreline shall be connected to the battery charger. A mating connector body shall also be supplied with the loose equipment. There shall be a label installed near the inlet(s) that state the following:

- Line Voltage
- Current Rating (amps)
- Phase
- Frequency

The shoreline receptacle shall be located in the driver side lower step well of cab.

**ALTERNATOR**

A alternator shall be provided. It shall have a rated output current of 360 amps, as measured by SAE method J56. It shall have a custom three (3)-set point voltage regulator. The alternator shall be connected to the power and ground distribution system with heavy-duty cables sized to carry the full rated alternator output.

**ELECTRONIC LOAD MANAGER**

An electronic load management (ELM) system shall 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. For improved reliability and ease of use, the load manager system shall 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 shall not be allowed.

The system shall include the following features:

- System voltage monitoring.
- A shed load shall remain inactive for a minimum of five minutes to prevent the load from cycling on and off.
- Sixteen available electronic load shedding levels.
- Priority levels can be set for individual outputs.

**II. Minimum Specifications:**

**Bidder Complies**

**Yes      No**

High Idle to activate before any electric loads are shed and deactivate with the service brake.

o If enabled:

§ "Load Man Hi-Idle On" shall display on the information center.

§ Hi-Idle shall not activate until 30 seconds after engine start up.

Individual switch "on" indicator to flash when the particular load has been shed.

The information center indicates system voltage.

The information center, where applicable, includes a "Load Manager" screen indicating the following:

Load managed items list, with priority levels and item condition.

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Individual load managed item condition:

o ON = not shed

o SHED = shed

**SEQUENCER**

A sequencer shall be provided that automatically activates and deactivates vehicle loads in a preset sequence thereby protecting the alternator from power surges. This sequencer operation shall 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. For improved reliability and ease of use, the load sequencing system shall 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 shall not be allowed. Emergency light sequencing shall operate in conjunction with the emergency master light switch. When the emergency master switch is activated, the emergency lights shall be activated one by one at half-second intervals. Sequenced emergency light switch indicators shall flash while waiting for activation. When the emergency master switch is deactivated, the sequencer shall deactivate the warning light loads in the reverse order. Sequencing of the following items shall also occur, in conjunction with the ignition switch, at half-second intervals:

Cab Heater and Air Conditioning

Crew Cab Heater (if applicable)

Crew Cab Air Conditioning (if applicable)

Exhaust Fans (if applicable)

Third Evaporator (if applicable)

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

<p><b><u>HEADLIGHTS</u></b>          There shall be four (4) rectangular LED lights mounted in the front quad style, chrome housing on each side of the cab grille:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> The outside light on each side shall contain an LED low beam module.</li> <li><input type="checkbox"/> The inside light on each side shall contain an LED high beam module.</li> </ul> <p><b><u>DIRECTIONAL LIGHTS</u></b>          There shall be two (2) Whelen 600 series LED combination directional/marker lights provided. The lights shall be located on the outside cab corners, next to the headlights. The color of the lenses shall be the same color as the LED's.</p> <p><b><u>INTERMEDIATE LIGHT</u></b>          There shall be two (2) amber LED turn signal marker lights furnished, one (1) each side, in the rear fender panel. The light shall double as a turn signal and marker light.</p> <p><b><u>CAB CLEARANCE/MARKER/ID LIGHTS</u></b>          There shall be seven (7) amber LED lights provided to indicate the presence and overall width of the vehicle in the following locations:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Three (3) amber LED identification lights shall be installed in the center of the cab above the windshield.</li> <li><input type="checkbox"/> Two (2) amber LED clearance lights shall be installed, one (1) on each outboard side of the cab above the windshield.</li> <li><input type="checkbox"/> Two (2) amber LED marker lights shall be installed, one (1) on each side above the cab doors.</li> </ul> <p><b><u>REAR CLEARANCE/MARKER/ID LIGHTING</u></b>          There shall be a three (3) LED light bar used as identification lights located at the rear of the apparatus per the following:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> As close as practical to the vertical centerline</li> <li><input type="checkbox"/> Centers spaced not less than 6.00" or more than 12.00" apart</li> <li><input type="checkbox"/> Red in color</li> <li><input type="checkbox"/> All at the same height</li> </ul> <p>There shall be two (2) LED lights installed at the rear of the apparatus used as clearance lights located at the rear of the apparatus per the following:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> To indicate the overall width of the vehicle</li> <li><input type="checkbox"/> One (1) each side of the vertical centerline</li> <li><input type="checkbox"/> As near the top as practical</li> <li><input type="checkbox"/> Red in color</li> <li><input type="checkbox"/> To be visible from the rear</li> <li><input type="checkbox"/> All at the same height</li> </ul>	
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**II. Minimum Specifications:**

Bidder Complies	
Yes	No

<p>There shall be two (2) LED lights installed on the side of the apparatus used as marker lights as close to the rear as practical per the following:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> To indicate the overall length of the vehicle</li> <li><input type="checkbox"/> One (1) each side of the vertical centerline</li> <li><input type="checkbox"/> As near the top as practical</li> <li><input type="checkbox"/> Red in color</li> <li><input type="checkbox"/> To be visible from the side</li> <li><input type="checkbox"/> All at the same height</li> </ul> <p>There shall 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.</p> <p>There shall be two (2) red reflectors located on the side of the truck facing to the side. One (1) each side, as far to the rear as practical, at a minimum of 15.00", but no more than 60.00", above the ground.</p> <p>Per FMVSS 108 and CMVSS 108 requirements.</p> <p><b><u>REAR FMVSS LIGHTING</u></b></p> <p>The rear stop/tail and directional LED lighting shall consist of the following:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Two (2) Whelen M6BTT red LED stop/tail lights</li> <li><input type="checkbox"/> Two (2) Whelen M6T amber LED arrow turn lights</li> </ul> <p>The lights shall be provided with color lenses.</p> <p>The lights shall be mounted in a polished combination housing.</p> <p>There shall be two (2) Whelen M6BUW LED backup lights provided in the tail light housing.</p> <p><b><u>LICENSE PLATE BRACKET</u></b></p> <p>There shall be one (1) license plate bracket mounted on the rear of the body.</p> <p>A white LED light shall illuminate the license plate. A polished stainless steel light shield shall be provided over the light that shall direct illumination downward, preventing white light to the rear.</p> <p><b><u>LIGHTING BEZEL</u></b></p> <p>There shall be two (2) Whelen M6FCV4P four (4) place chromed ABS housings provided for the rear stop/tail, directional, back up, scene lights or warning lights.</p> <p><b><u>BACK-UP ALARM</u></b></p> <p>A solid-state electronic audible back-up alarm that actuates when the truck is shifted into reverse shall be provided. The device shall sound at 60 pulses per minute and automatically adjust its volume to maintain a minimum ten (10) DBA above surrounding environmental noise levels.</p>	
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**II. Minimum Specifications:**

Bidder Complies	
Yes	No

**CAB PERIMETER SCENE LIGHTS**

There shall be four (4) 20.00" white LED strip lights provided, one (1) for each cab door. These lights shall be activated automatically when the battery switch is on and the exit doors are opened or by the same means as the body perimeter scene lights.

**PUMP HOUSE PERIMETER LIGHTS**

There shall be two (2) 20.00" LED weatherproof strip lights with brackets provided under the pump panel running boards, one (1) each side. The lights shall be controlled by the same means as the body perimeter lights.

**BODY PERIMETER SCENE LIGHTS**

There shall be two (2) 20.00" 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 shall be activated when the parking brake is applied.

**STEP LIGHTS**

Four (4) white LED step lights shall be provided. One (1) step light shall 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 shall 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. These step lights shall be actuated with the pump panel light switch. All other steps on the apparatus shall be illuminated per the current edition of NFPA 1901.

**REAR SCENE LIGHT(S)**

There shall be two (2) LED scene light(s) with 13 degree internal optics installed at the rear of the apparatus, one (1) each side of the hosebed, high up on the rear . The light(s) shall be controlled from the first switch feature, a control at the driver side switch panel. The light(s) may also be controlled from the second switch feature, a control at the driver side rear of the truck. The light(s) can be load managed when the parking brake is set.

**12 VOLT LIGHT BRACKET**

There shall be four (4) painted smooth aluminum bracket(s) installed high up on each side sheet, one (1) toward the front and one (1) toward the rear hose bed side sheet for the recessed flood light. The bracket(s) shall have all wiring totally enclosed.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

**12 VOLT LIGHTING**

There shall be two (2) Whelen MPR15 12 volt DC LED floodlight(s) installed in a chrome bezel angled down 15 degrees, located one (1) each side, high up on the cab, above the fixed window between the cab and crewcab.

The painted parts of this light assembly to be white.

The light(s) selected above shall be controlled by the following:

- a switch at the driver's side switch panel
- a switch at the passenger's side switch panel
- a switch at the pump operator's panel
- no additional switch location

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

**12 VOLT LIGHTING**

There shall be two (2) Whelen PCP2 12 volt LED combination spotlight and floodlight(s) installed in semi-recessed housing(s) (PBA203) located high up on the right side sheet, one (1) toward the front and one (1) toward the rear.

The painted parts of this light assembly to be white.

The light(s) selected above shall be controlled by the following:

- a switch at the driver's side switch panel
- a switch at the passenger's side switch panel
- a switch at the pump operator's panel
- no additional switch location

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

**12 VOLT LIGHTING**

There shall be two (2) Whelen PCP2 12 volt LED combination spotlight and floodlight(s) installed in semi-recessed housing(s) (PBA203) located high up on the left side sheet, one (1) toward the front and one (1) toward the rear.

The painted parts of this light assembly to be white.

The light(s) selected above shall be controlled by the following:

- a switch at the driver's side switch panel
- a switch at the passenger's side switch panel
- a switch at the pump operator's panel
- no additional switch location

These light(s) may be load managed when the parking brake is set

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

**12 VOLT LIGHTING**

There shall be one (1) Whelen Pioneer PCP2 12 volt LED combination spot/flood light(s) provided on the front visor, centered. The painted parts of this light assembly to be white.

The light(s) shall be controlled by the following:

- a switch at the driver's side switch panel
- a switch at the passenger's side switch panel
- no additional switch location

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

**HOSE BED LIGHTS**

There shall be white 12 volt DC LED light strips with stainless steel protective cover, provided to light the hose bed area.

- One (1) light strip shall be installed the entire length of the driver's side of the hose bed.
- One (1) light strip shall be installed the entire length of the passenger's side of the hose bed.

The lights shall be activated by a cup switch at the rear of the apparatus no more than 62.00" from the ground.

**REAR SCENE LIGHTS**

There shall be two (2) 35 watt 12 volt halogen scene lights with 15 degree angled brackets installed at the rear of the vehicle, under the tailboard, facing the rear.

The lights shall be controlled by a switch at the driver's side switch panel.

**REAR SCENE LIGHT(S)**

There shall be two (2) LED scene light(s) with 15 degree chrome bezel(s) installed at the rear of the apparatus, one (1) each side in the boxes housing the upper rear zone warning lights. The light(s) shall be controlled by a switch at the driver's side switch panel and by a cup switch at the driver's side rear bulkhead. The light(s) can be load managed when the parking brake is set.

**WATER TANK, 2500 GALLON POLYPROPYLENE**

The tank shall be built by United Plastic Fabricating, Inc. The booster tank shall have a capacity of 2500 gallons and be constructed of polypropylene plastic. Tank to be "T" shaped to provide for deep side compartments and to serve as a large sump to limit the amount of undraftable water. The joints and seams shall be nitrogen welded inside and out. Tank to be baffled in accordance with NFPA Bulletin 1901 requirements. The baffles shall have vent openings at both the top and bottom to permit movement of air and water between compartments. The longitudinal partitions shall be constructed of .38" polypropylene plastic and shall extend from the bottom of the tank through the top cover to allow positive welding. The transverse partitions shall extend from 4" off the tank bottom to the underside of the top cover. All partitions shall interlock and shall be welded to the tank bottom and

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

sides. The tank top shall be constructed of .50" polypropylene. It shall be recessed .38" from the top of the tank and shall be welded to the tank sides and the longitudinal partitions. Top shall be sufficiently supported to keep it rigid during fast filling conditions. Construction shall include 2.00" polypropylene dowels spaced no more than 30.00" apart and welded to the transverse partitions. Two (2) of the dowels shall be drilled and tapped (.50" diameter, 13.00" deep) to accommodate lifting eyes. A sump that is 8.00" x 8.00" x 6.00" deep shall be provided at the bottom of the water tank. The sump shall include a drain plug and the tank outlet. The tank shall be installed in a fabricated cradle assembly constructed on 3.00" x 3.00" x .25" angle iron. Rubber cushions, .50" thick x 3.00" wide, shall be placed on all horizontal surfaces that the tank rests on. Fill tower shall be constructed of .50" polypropylene and shall be a minimum of 10.00" wide x 16.00" long. The fill tower shall be located in the center of the tank on the driver's side. Fill tower shall be furnished with a .25" thick polypropylene screen and a hinged cover. An overflow pipe, constructed of 6.00" schedule 40 polypropylene, shall be installed approximately halfway down the fill tower and extend through the water tank and dump to the rear of the rear axle. Tank shall be installed in a fabricated cradle assembly constructed of structural steel. Sufficient crossmembers shall be provided to properly support bottom of tank. The crossmembers shall be channel and supported by steel flat bar. Tank shall "float" in cradle to avoid torsional stress caused by chassis frame flexing. Rubber cushions, .50" thick x 3.00" wide, shall be placed on all horizontal surfaces that the tank rests on. Full length angles shall be provided to hold the tank in position. Stops or other provision shall be provided to prevent an empty tank from bouncing excessively while moving vehicle.

**TANK CRADLE**

The water tank shall be installed in a fabricated cradle assembly constructed of stainless steel. Sufficient crossmembers shall be provided to properly support bottom of tank. Crossmembers shall be constructed of stainless steel bar channel or rectangular tubing. Isolator material shall be provided between the frame and cradle. Two (2) sleeves shall be provided in the water tank for a 3.00" pipe to the rear.

**WATER TANK RESTRAINT**

A heavy-duty water tank restraint shall be provided.

**DIRECT TANK FILL**

There shall be one (1) 4.00" semi-automatic tank fill(s) installed and properly labeled at the rear of the water tank, located passenger's side, with the valve installed as low as practical for easy hose connection. Piping, for the fill, shall be routed through the rear wall of the tank and include a flow deflector to break up the stream of water entering the water tank. A 4.00" (F)NST x 4.00" Storz hard coat aluminum 30 degree elbow adapter and 4.00" blind cap shall be provided for the tank fill.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

**REAR TANK DUMP**

One (1) 10.00" butterfly valve shall be installed at the rear through the rear body panel in the area over the tailboard. The valve shall have 316 stainless steel shaft and disc, and NBR seat. The valve shall be actuated pneumatically from one of three switches.

The three (3) switches shall be located: one (1) inside the cab, one (1) at the rear of the apparatus on the driver side, and one (1) at the rear of the apparatus on the passenger side.

**SIDE TANK DUMP VALVES**

Two (2) 10.00" butterfly valves shall be installed one (1) each side between the tandem axles. The valve shall have 316 stainless steel shaft and disc, and NBR seat. The valve shall be actuated pneumatically from one (1) switch inside the cab and one (1) switch at the rear of the apparatus.

A telescopic extension chute shall be included with each dump valve.

These chutes shall have an air control and ID light located in the cab.

**DUMP CHUTE, S/S DOORS**

A dump chute door system constructed of aluminum shall be installed over each side dump chute opening. The door system shall be designed with a hinge at the top of the door to open when the chute extends and a magnet to assist in holding the door closed when the chute is not extended. Opening and closing of the door shall occur automatically when the chute extends/retracts. The exterior of the doors shall be covered with polished stainless steel. Dump chutes will be protected from road dirt as to not hinder the operation of dump chutes.

**SWITCH, MASTER FOR DUMP VALVE**

One (1) master on/off switch shall be provided for the water tank dump valves. The switch shall be located at the cab instrument panel.

**HOSE BED**

The hose bed shall be fabricated of .125"-5052 aluminum with a nominal 38,000 psi tensile strength. The sides shall not form any portion of the fender compartments.

Hose bed width shall be minimum of 70.00" inside. Upper and rear edges of side panels shall have a double break for rigidity, a split tube finish shall not be acceptable.

The upper inside area of the beavertails shall be covered with brushed stainless steel to prevent damage to painted surface when hose is removed. Flooring of the hose bed shall be removable aluminum grating with the top surface corrugated to aid in hose aeration.

The grating slats shall be a minimum of 0.50" x 4.50" with spacing between slats for hose ventilation. Hose bed shall accommodate from left to right: 400' of 1.75"; 200' 1.75"; 1,200' of 5.00" LDH; 200' of 2.50"; 200' of 2.50"; 300' of 3.00".

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

**HOSE BED DIVIDER**

Five (5) adjustable hosebed dividers shall be furnished for separating hose. Each divider shall be constructed of a .125" brushed aluminum sheet fitted and fastened into a slotted, 1.50" diameter radiused extrusion along the top, bottom, and rear edge. Divider shall be fully adjustable by sliding in tracks, located at the front and rear of the hose bed. Divider shall be held in place by tightening bolts, at each end. Acorn nuts shall be installed on all bolts in the hose bed which have exposed threads.

**SHELF, HINGED IN HOSE BED**

There shall be one (1) hinged shelves, constructed of aluminum grating, provided for hose or equipment storage inside the hose bed located in Bay One (1) on the driver's side. The shelf shall be attached to the hose bed side sheet.

**HOSEBED HOSE RESTRAINT**

A red hosebed cover shall be furnished with velcro with snaps fasteners at the front and velcro with jacket snaps in each corner fasteners on the sides. There shall be seat belt buckle fasteners at the bottom of the rear body sheet below the hosebed. The flap at the rear shall be chain weighted.

**RUNNING BOARDS**

Running boards shall be fabricated of .125" bright aluminum treadplate. Each running board shall be supported by a welded 2.00" square tubing and channel assembly, which shall be bolted to the pump compartment substructure. Running boards shall be 12.75" deep and spaced .50" away from the pump panel. A splash guard shall be provided above the running board treadplate.

**TAILBOARD**

The tailboard shall also be constructed of .125" bright aluminum treadplate supported by a structural steel assembly. The tailboard area shall be 20.00" deep. The exterior side shall be flanged down and in for increased rigidity of tailboard structure.

**BACKSTOP BRAKING SYSTEM**

A back stop device shall be provided to protect the lives of our fire fighters. A rubber touch sensitive bumper shall be installed on the rear of the tailboard. This bumper shall actuate the chassis brake system with a light touch. As a safety precaution the backstop brake system shall only be actuated when the transmission is in reverse.

**II. Minimum Specifications:**

**Bidder Complies**

Yes No

**REAR WALL, SMOOTH ALUMINUM/BODY MATERIAL**

The rear facing surfaces of the center rear wall shall be smooth aluminum.  
The bulkheads, the surface to the rear of the side body compartments, shall be smooth and the same material as the body. Any inboard facing surfaces below the height of the hosebed shall be aluminum diamond plate.

**TOW EYES**

Two (2) rear painted tow eyes shall be located at the rear of the apparatus and shall be mounted directly to the chassis frame rails. The inner and outer edges of the tow eyes shall have a radius.

**COMPARTMENTATION**

Body and compartments shall be fabricated of .125" 5052 aluminum.  
Side compartments shall be an integral assembly with the rear fenders.  
Circular fender liners shall be provided for prevention of rust pockets and ease of maintenance. Compartment flooring shall be .125" and of the sweep out design, with the floor higher than the compartment door lip. The compartment door opening shall be framed by flanging the edges in 1.75" and bending out again .75" to form an angle.  
Drip protection shall be provided above the doors by means of bright aluminum extrusion, formed bright aluminum treadplate, or polished stainless steel. The top of the compartment shall be covered with bright aluminum treadplate rolled over the edges on the front, rear, and outward side. These covers shall have the corners welded. Side compartment covers shall be separate from the compartment tops.  
Front facing compartment walls shall be covered with bright aluminum treadplate.  
All screws and bolts which protrude into a compartment shall have acorn nuts on the ends to prevent injury.

**UNDERBODY SUPPORT SYSTEM**

Due to the severe loading requirements of this pumper, a method of body and compartment support suitable for the intended load shall be provided.  
The backbone of the support system shall be the chassis frame rails, which is the strongest component of the chassis and designed for sustaining maximum loads.  
Support system shall include .375" thick steel vertical angle supports bolted to the chassis frame rails with .50" diameter bolts. Attached to the bottom of the steel vertical angles shall be horizontal angles gusseted and welded to the vertical members, extending to the outside edge of the body. A design with body compartments hanging on the chassis, unsupported, shall not be acceptable.

**AGGRESSIVE WALKING SURFACE**

All exterior surfaces designated as stepping, standing, and walking areas shall comply with the required average slip resistance of the current NFPA standards.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

<p><b><u>COMPARTMENT VENTILATION</u></b>  All compartments shall be ventilated. A louvered vent shall be furnished in a wall of the lower compartments to provide the proper airflow inside the compartment and to prevent water from dripping into the compartment. These louvers shall be formed into the metal and not added to the compartment as a separate plate.</p> <p><b><u>DRIVER'S SIDE COMPARTMENTS</u></b>  A 3/4 height, vertically hinged, double door compartment ahead of the rear wheels shall be provided. The interior dimensions of this compartment shall be 44.50" wide x 42.75" high x 24.00" deep in the lower 26.00" of the compartment and 10.88" deep in the remaining upper portion. The depth of the compartment shall be calculated with the compartment door closed. The clear door opening of this compartment shall be 40.00" wide x 42.50" high. A positive door holder shall be furnished with this compartment. Two (2) compartments shall be provided above the fender compartments. Each compartment shall be approximately 84.00" wide x 10.38" high x 10.88" deep. The depth of the compartment shall be calculated with the compartment door closed. The clear door opening of this compartment shall be 78.12" wide x 7.75" high. The liftup doors shall be furnished with two gas struts, one on each end of the door. Closing of the door shall not require releasing, unlocking, or unlatching any mechanism. A double door compartment shall be behind the rear wheels, 54.50" wide x 29.75" high x 24.00" deep inside, with a door opening of 50.00" wide x 26.62" high.  A positive door holder shall be furnished with this compartment.</p> <p><b><u>PASSENGER'S SIDE COMPARTMENTS</u></b>  The passenger's side compartments shall consist of:  A double door compartment shall be ahead of the rear wheels, 44.50" wide x 29.75" high x 24.00" deep inside with a door opening of 40.00" wide x 26.62" high. A double door compartment shall be behind the rear wheels, 54.50" wide x 29.75" high x 24.00" deep inside, with a door opening of 50.00" wide x 26.62" high. Mounting provisions shall be provided between the tandem axles for a 10.00" round dump valve. Access panels shall be provide in both fender wells to install or service the dump valve when required.</p> <p><b><u>DOORS, SIDE COMPARTMENT</u></b>  All hinged compartment doors shall be lap style with double panel construction and shall be a minimum of 1.50" thick. To provide additional door strength a "C" section reinforcement shall be installed between the outer and interior panels. Doors shall be provided with a closed cell rubber gasket around the surface that laps onto the body. A second heavy-duty automotive rubber molding with a hollow core shall be installed on the door framing that seals onto the interior panel, to ensure a weather resisting compartment. All compartment doors shall have polished stainless steel continuous hinge with a pin diameter of .25" that is bolted or screwed on with stainless steel fasteners. (Hinges which are welded on shall not</p>	
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**II. Minimum Specifications:**

Bidder Complies	
Yes	No

be acceptable.) A strip of dielectric isolation tape shall be provided between the hinge and door jamb. All door lock mechanisms shall be fully enclosed within the door panels to prevent fouling of the lock in the event equipment inside shifts into the lock area. Doors shall be latched with recessed, polished stainless steel "D" ring handles and Eberhard 106 locks. To prevent corrosion caused by dissimilar metals, compartment door handles shall not be attached to outer door panel with screws. A rubber gasket shall be provided between the "D" ring handle and the door.

**REAR COMPARTMENT**

A tool compartment shall be provided at the rear of the apparatus. The compartment shall be approximately 26.00" wide x 8.00" high x 6.00" deep.

A drop-down door constructed of smooth aluminum with a pawl latch shall be provided.

**PROTECTIVE TAPE**

Protective tape, manufactured by 3-M, shall be installed on the lower door openings of the body compartments.

**COMPARTMENT LIGHTING**

There shall be four (4) compartment(s) with two (2) white 12 volt DC LED compartment light strips. The dual light strips shall be centered vertically along each side of the door framing. There shall be two (2) light strips per compartment. The dual light strips shall be in all body compartment(s). Any remaining compartments shall have adequate LED strip lighting located in the compartment. Opening the compartment door shall automatically turn the compartment lighting on.

**MOUNTING TRACKS**

There shall be four (4) sets of tracks for mounting shelf(s) in D2, D1, P1 and P2. These tracks shall be installed vertically to support the adjustable shelf(s), and shall be full height of the compartment. The tracks shall be painted to match the compartment interior.

**ADJUSTABLE SHELVES**

There shall be two (2) shelves with a capacity of 500 lb provided. The shelf construction shall consist of .188" aluminum with 2.00" sides. Each shelf shall be painted to match the compartment interior. Each shelf shall be infinitely adjustable by means of a threaded fastener, which slides in a track. The shelves shall be held in place by .12" thick stamped plated brackets and bolts. The location shall be D - 2, P - 2.

**SLIDE-OUT FLOOR MOUNTED TRAY**

There shall be three (3) floor mounted slide-out tray(s) with 2.00" sides provided D1, P1 and D2. Each tray shall be rated for up to 500lb in the extended position. The tray(s) shall be constructed of a minimum .13" aluminum with welded corners. The finish shall be

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

painted to match compartment interior. There shall be two under mount-roller bearing type slides rated at 250lb each provided. The pair of slides shall have a safety factor rating of 2. To ensure years of dependable service, the slides shall be coated with a finish that is tested to withstand a minimum of 1,000 hours of salt spray per ASTM B117. To ensure years of easy operation, the slides shall require no more than a 50lb force for push-in or pull-out movement when fully loaded after having been subjected to a 40 hour vibration (shaker) test under full load. The vibration drive file shall have been generated from accelerometer data collected from a heavy truck chassis driven over rough gravel roads in an unloaded condition. Proof of compliance shall be provided upon request. Automatic locks shall be provided for both the "in" and "out" positions. The trip mechanism for the locks shall be located at the front of the tray for ease of use with a gloved hand.

**MATTING, COMPARTMENT SHELVING**

Turtle Tile compartment matting shall be provided in two (2) shelves. The locations are, P - 2, D - 2. The color of the Turtle Tile shall be gray.

**MATTING, COMPARTMENT FLOOR**

Turtle Tile compartment matting shall be provided in three (3) compartments on the compartment floor. The locations are, P - 1; P - 2; D - 1. The Turtle Tile shall be gray and the leading edge of the matting shall include the beveled edge. The beveled edge shall be gray.

**PORTABLE TANK RACK, HYDRAULIC**

A hydraulic rack shall be provided on the driver side body compartments for a portable water tank. The rack shall be properly sized to house a 2500 gallons portable tank. The tank rack controls shall be located in such a manner to allow the operator full view of the area in which the portable tank shall be lowered. The actuator control shall have a master switch and also be interlocked to prevent operation should a compartment door, in the travel area of the rack, be in the open position. A bright finish aluminum treadplate cover shall be installed on the lowering device to protect the Fol-Da-Tank. This cover shall be installed with a mounting kit to allow for flexing.

**RACK INTERLOCK AND NOT STOWED INDICATOR LIGHT**

An interlock shall be provided to prevent operation of the rack unless the apparatus parking brake has been activated. A steady red indicator light shall be located on the cab instrument panel and illuminated when the rack is not in the stowed position. The light shall be labeled "Rack". In addition, the "Do Not Move Apparatus" light located in the cab shall be activated when the rack is not in the stowed position.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

**FLASHING LIGHTS ON RACK**

Flashing amber LED lights facing the front and rear shall be provided on the rack and activated whenever the rack is in the down position.

**RUB RAIL**

Bottom edge of the side compartments shall be trimmed with a bright aluminum extruded rub rail. Trim shall be 2.12" high with 1.38" flanges turned outward for rigidity. The rub rails shall not be an integral part of the body construction, which allows replacement in the event of damage.

**BODY FENDER CROWNS**

Stainless steel fender crowns shall be provided around the rear wheel openings. A rubber welting shall be provided between the body and the crown to seal the seam and restrict moisture from entering.

**HARD SUCTION HOSE**

Two (2) lengths of 6.00" clear corrugated PVC hard suction hose, 15' in length, shall be provided. The hose shall be equipped with a long handle female coupling on one (1) end and a rocker lug male coupling on the other end. Couplings shall be hard coated aluminum.

**HOSE TROUGHS**

The hard suction hose, 15' in length, shall be carried in two (2) v-shaped troughs, one (1) on each side. The hard suction hose shall be held in place by chrome plated, quarter turn, spring loaded clamps. The troughs shall be constructed of galvaneal steel.

**HOSE TROUGH**

One (1) trough for hard suction hose shall be installed on the top of the Zico Quic-Lift electric lowering system. Velcro straps shall be provided to secure the hose to the trough.

**MANUAL LOCKS ON LIFTING SYSTEM**

Manual locks shall be provided for the Zico Quic-Lift system(s). A total of two (2) set(s) of lock(s) shall be provided. The lock(s) shall be supplied on the system(s) located on the left and right side Zico lift systems.

**HANDRAILS**

The handrails shall be 1.25" diameter anodized aluminum extrusion, with a ribbed design, to provide a positive gripping surface. Chrome plated end stanchions shall support the handrail. Plastic gaskets shall be used between end stanchions and any painted surfaces. Drain holes shall be provided in the bottom of all vertically mounted handrails. Handrails shall be provided to meet NFPA 1901 section 15.8 requirements. The handrails shall be installed as noted on the sales drawing.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

**HANDRAILS**

One (1) vertical handrail, not less than 29.00" long, shall be located on each rear beavertail. One (1) full width horizontal handrail shall be provided below the hose bed at the rear of the apparatus.

- Three (3) handrails, 6.00" long, shall be provided mounted PS front bulkhead, two feet above folding step; high up on PS front bulkhead, and on DS, high up front bulkhead. 82 of 12

**AIR BOTTLE STORAGE (SINGLE)**

A quantity of three (3) air bottle compartments, 7.75" in diameter x 26.00" deep, shall be provided on the driver side forward of the rear wheels, on the passenger side forward of the rear wheels and on the passenger side rearward of the rear wheels. A brushed stainless steel door with a chrome plated flush lift & turn latch shall be provided to contain the air bottle. A dielectric barrier shall be provided between the door hinge, hinge fasteners and the body sheet metal. Inside the compartment, black rubber matting shall be provided.

**EXTENSION LADDER**

There shall be a 28', two (2)-section, aluminum extension ladder provided.

**ROOF LADDER**

There shall be one (1) 16' aluminum roof ladder(s) provided.

**LADDER RACK**

Ground ladders shall be mounted above right side of body compartments in a Zico Quic-Lift electric ladder lowering system. The ladder rack mounts shall be powered by two (2), 12-volt electric actuators. The electric controls shall be located in such a manner to allow the operator full view of the area in which the ladders shall be lowered. The electric actuator control shall have a master switch and be interlocked to prevent operation should a compartment door, in the travel area of the ladder bracket, be in the open position.

**LADDER RACK INTERLOCK AND NOT STOWED INDICATOR LIGHT**

An interlock shall be provided to prevent operation of the ladder rack unless the apparatus parking brake has been activated. A steady red indicator light shall be located on the cab instrument panel and illuminated when the hydraulic ladder rack is not in the stowed position. The light shall be labeled "Ladder Rack". In addition, the "Do Not Move Apparatus" light located in the cab shall be activated when the hydraulic ladder rack is not in the stowed position.

**LIGHTS, FLASHING, HYD LADDER RACK**

Flashing amber lights facing the front and rear shall be provided on the ladder rack and activated whenever the rack is in the down position.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

**FOLDING LADDER**

One (1) 10.00' aluminum folding ladder shall be installed in a stainless steel trough inside the hard suction hose storage compartment on the driver side.

**PIKE POLE PROVIDED BY FIRE DEPARTMENT**

NFPA 1901, 2009 edition, Section 5.8.3 requires one (1) 8 ft or longer pike pole mounted in a bracket fastened to the apparatus. The pike pole is not on the apparatus as manufactured. The fire department shall provide and mount the pike pole.

**6 FT PIKE POLE PROVIDED BY FIRE DEPARTMENT**

NFPA 1901, 2009 edition, Section 5.8.3 requires one (1) 6 ft pike pole or plaster hook mounted in a bracket fastened to the apparatus. The pike pole is not on the apparatus as manufactured. The fire department shall provide and mount the pike pole.

**PIKE POLE STORAGE**

PVC tubing shall be used for the storage of two (2) pike poles and shall be located in the 3/4 height compartment on the left side. If the head of a pike pole can come in contact with a painted surface, a stainless steel scuffplate shall be provided.

**STEP**

A folding step shall be provided on the passenger side front of each fender compartment. The step shall be bright finished, non-skid with a black coating. The step shall incorporate an LED light to illuminate the stepping surface. The step can be used as a hand hold with two openings wide enough for a gloved hand.

**STEPS, REAR**

Bright aluminum treadplate corner steps shall be provided at the rear, low. All steps shall provide adequate surface for stepping. A full width 9.00" deep bright aluminum treadplate shall be provided at the rear of the apparatus for access to the hose bed.  
 Chrome folding steps shall be provided at the rear, upper. All steps shall provide adequate surface for stepping. One (1) additional folding step shall be located on the driver side front bulkhead. The step(s) shall be bright finished, non-skid with a black coating. Each step shall 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.

**PUMP**

Pump shall be a 1750 gpm single (1) stage midship mounted centrifugal type.  
 Pump shall be the class "A" type.  
 Pump shall deliver the percentage of rated discharge at pressures indicated below:  
 - 100% of rated capacity at 150 psi net pump pressure.  
 -70% of rated capacity at 200 psi net pump pressure.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

-50% of rated capacity at 250 psi net pump pressure.

Pump body shall 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). Pump shall be designed for complete servicing from the bottom of the truck, without disturbing the pump setting or apparatus piping. Pump case halves shall be bolted together on a single horizontal face to minimize a chance of leakage and facilitate ease of reassembly. No end flanges shall be used. Discharge manifold of the pump shall be cast as an integral part of the pump body assembly and shall provide a minimum of three (3) 3.50" openings for flexibility in providing various discharge outlets for maximum efficiency. The three (3) 3.50" openings shall 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.

Impeller shaft shall be stainless steel, accurately ground to size. It shall be supported at each end by sealed, anti-friction ball bearings for rigid precise support. Impeller shall have flame plated hubs assuring maximum pump life and efficiency despite any presence of abrasive matter in the water supply. Bearings shall be protected from water and sediment by suitable stuffing boxes, flinger rings, and oil seals. No special or sleeve type bearings shall be used.

Pump shall be equipped with a self-adjusting, maintenance-free, mechanical shaft seal. The mechanical seal shall consist of a flat, highly polished, spring fed carbon ring that rotates with the impeller shaft. The carbon ring shall press against a highly polished stainless steel stationary ring that is sealed within the pump body. In addition, a throttling ring shall 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 shall not deteriorate, nor shall the pump lose prime, while drafting if the seal fails during pump operation. Wear rings shall be bronze and easily replaceable to restore original pump efficiency and eliminate the need to replace the entire pump casing due to wear.

**PUMP TRANSMISSION**

Pump transmission shall be made of aluminum with a horizontally split casing. Power transfer to pump shall be by high strength silent chain. Drive shafts shall be a minimum of 2.35" diameter hardened and ground alloy steel. All shafts shall be ball bearing supported. The case is to be designed as to eliminate the need for water cooling.

**AIR PUMP SHIFT**

Pump shift engagement shall 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 shall also be located on the pump operator's pump panel. Two (2) indicator lights shall be provided adjacent to the pump shift inside the cab. One (1) green light shall indicate the pump shift has been completed and be labeled "pump engaged". The second green light shall indicate when the pump has been engaged, and that the chassis transmission is in pump gear. This indicator light shall be labeled "OK to

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

pump". Another green indicator light shall be installed adjacent to the hand throttle on the pump panel and indicate either the pump is engaged and the road transmission is in pump gear, or the road transmission is in neutral and the pump is not engaged. This indicator light shall be labeled "Warning: Do not open throttle unless light is on". The pump shift control in the cab shall be illuminated to meet NFPA requirements.

**TRANSMISSION LOCK-UP**

The direct gear transmission lock-up for the fire pump operation shall engage automatically when the pump shift control in the cab is activated.

**AUXILIARY COOLING SYSTEM**

A supplementary heat exchange cooling system shall be provided to allow the use of water from the discharge side of the pump for cooling the engine water. Heat exchanger shall be cylindrical type and shall be a separate unit. It shall be installed in the pump or engine compartment with the control located on the pump operator's control panel. Exchanger shall be plumbed to the master drain valve.

**INTAKE RELIEF VALVE**

An intake relief valve shall be installed on the suction side of the pump preset at 125 psig. Relief valve shall have a working range of 50 psig to 350 psig. Outlet shall terminate below the frame rails with a 2.50" National Standard hose thread adapter and shall have a "do not cap" warning tag. An adjustable air regulator and pressure indicating gauge shall be located behind the right (passenger's) side pump panel.

**PRESSURE CONTROLLER**

A Pressure Governor shall be provided. An electric pressure governor shall be provided which is capable of automatically maintaining a desired preset discharge pressure in the water pump. When operating in the pressure control mode, the system shall automatically maintain the discharge pressure set by the operator (within the discharge capabilities of the pump and water supply) regardless of flow, within the discharge capacities of the water pump and water supply. A pressure transducer shall be installed in the water discharge of the pump. The transducer continuously monitors pump pressure sending a signal to the Electronic Control Module (ECM). The governor can be used in two (2) modes of operation, RPM mode and pressure modes. In the RPM mode, the governor can be activated after vehicle parking brake has been set. When in this mode, the governor shall maintain the set engine speed, regardless of engine load (within engine operation capabilities). In the pressure mode, the governor system can only operate after the fire pump has been engaged and the vehicle parking brake has been set. When in the pressure mode, the pressure controller monitors the pump pressure and varies engine speed to maintain a precise pump pressure. The pressure controller shall use a quicker reacting J1939 database for engine control. A preset feature allows a predetermined pressure or rpm to be set.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

A pump cavitation protection feature is also provided which shall return the engine to idle should the pump cavitate. Cavitation is sensed by the combination of pump pressure below 30 psi and engine speed above 2000 rpm for more than five (5) seconds. The throttle shall be a vernier style control, with a large control knob for use with a gloved hand. A throttle ready light shall be provided adjacent to the throttle control. A large 0.75" RPM display shall be provided to be visible at a glance.

Check engine, and stop engine indicator lights shall be provided for easy viewing.

Large 0.75" push buttons shall be provided for menu, mode, preset, and silence selections. The water tank level indicator shall be incorporated in the pressure governor. A fuel level indicator shall be incorporated in the pressure controller.

A pump hour meter shall be incorporated in the pressure controller. The pressure controller shall incorporate monitoring for engine temperature, oil pressure, fuel level alarm, and voltage. Pump monitoring shall include, pump gear case temperature, error codes, diagnostic data, pump service reminders, and time stamped data logging, to allow for fast accurate trouble shooting. It shall also notify the driver/engineer of any problems with the engine and the apparatus. Complete understandable messages shall be provided in a 20-character display, providing for fewer abbreviations in the messages. An automatic dim feature shall be included for night operations.

The pressure controller shall include a USB port for easy software upgrades, which can be downloaded through a USB memory stick, eliminating the need for a laptop for software installations. A complete interactive manual shall be provided with the pressure controller.

**PRIMING PUMP**

The priming pump shall be a Trident compressed air powered, high efficiency, multistage venture based priming system, conforming to standards outlined in the current edition of NFPA 1901. All wetted metallic parts of the priming system are to be of brass and stainless steel construction. One (1) priming control shall open the priming valve and start the pump primer.

**SPECIAL HEAT ENCLOSURE**

A heat enclosure shall be installed, trapping hot air radiated from the engine exhaust system, which shall warm the fire pump. The enclosure shall consist of a 12 gauge galvanneal steel understructure, with easily removable panels. Also a covering above the pump shall be provided, so warm air cannot escape freely. In addition to the lower heat pan, the front and rear of the pump house shall be enclosed to contain the heat. The rear shall have openings for the plumbing only. A rubber boot shall be supplied around the plumbing, at the front, sides and rear of the pump house, the boot shall allow the plumbing to flex and keep cold air out. The top of the pump compartment shall have a solid sheet to contain the heat.

**II. Minimum Specifications:**

**Bidder Complies**

**Yes      No**

**RECIRCULATING LINE WITH CHECK VALVE**

A 0.50" diameter recirculating line, from the pump to the water tank, shall be furnished with a control installed at the pump operator's control panel. A check valve shall 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.

**PUMP MANUALS**

There shall be a total of two (2) pump manuals provided by the pump manufacturer and furnished with the apparatus. The manuals shall be provided by the pump manufacturer in the form of two (2) CDs. Each manual shall cover pump operation, maintenance, and parts.

**PLUMBING**

All inlet and outlet plumbing, 3.00" and smaller, shall be plumbed with either stainless steel pipe or synthetic rubber hose reinforced with high-tensile polyester braid. Small diameter secondary plumbing such as drain lines shall be stainless steel, brass or hose.

Where vibration or chassis flexing may damage or loosen piping or where a coupling is required for servicing, the piping shall be equipped with victaulic or rubber couplings.

Plumbing manifold bodies shall be ductile cast iron or stainless steel. All lines shall drain through a master drain valve or shall be equipped with individual drain valves. All individual drain lines for discharges shall be extended with a hose to drain below the chassis frame.

All water carrying gauge lines shall be of flexible polypropylene tubing.

**MAIN PUMP INLETS**

A 6.00" pump manifold inlet shall be provided on each side of the vehicle. The suction inlets shall include screens that are designed to provide cathodic protection for the pump, thus reducing corrosion in the pump.

**MAIN PUMP INLET CAP**

The main pump inlets shall have National Standard Threads with a long handle chrome cap. The cap shall incorporate a thread design to automatically relieve stored pressure in the line when disconnected (no exception).

**SHORT SUCTION TUBE**

The suction tubes on the mid-ship pump shall have short suction tubes to allow for installation of adapters without excessive overhang.

**VALVES**

All discharge valves shall be controlled at the pump operator's panel.

**II. Minimum Specifications:**

**Bidder Complies**

**Yes      No**

**LEFT SIDE INLET**

There shall 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 shall be provided with a strainer, chrome swivel and plug. The location of the valve for the one (1) inlet shall be recessed behind the pump panel.

**ANODE, INLET**

A pair of sacrificial zinc anodes shall be provided in the water pump inlets to protect the pump from corrosion.

**INLET CONTROL**

The side auxiliary inlet(s) shall incorporate a quarter-turn ball valve with the control located at the inlet valve. The valve operating mechanism shall indicate the position of the valve.

**INLET BLEEDER VALVE**

A 0.75" bleeder valve shall be provided for each side gated inlet. The valves shall be located behind the panel with a swing style handle control extended to the outside of the panel. The handles shall be chrome plated and provide a visual indication of valve position. The swing handle shall provide an ergonomic position for operating the valve without twisting the wrist and provides excellent leverage. The water discharged by the bleeders shall be routed below the chassis frame rails.

**TANK TO PUMP**

The booster tank shall be connected to the intake side of the pump with (2) 4.00" heavy-duty piping and a quarter turn 3.50" valve. The air control shall be remotely located at the operator's panel. The tank to pump line shall run straight, without elbows, from the pump into the front face of the water tank and angle down into the tank sump. A rubber coupling shall be included in this line to prevent damage from vibration or chassis flexing. A check valve shall be provided in the tank to pump supply line to prevent the possibility of back filling the water tank.

**TANK REFILL**

A 2.00" combination tank refill and pump re-circulation line shall be provided, using a quarter-turn full flow ball valve controlled from the pump operator's panel.

**LEFT SIDE DISCHARGE OUTLETS**

There shall be one (1) discharge outlet with a 2.50" valve on the left side of the apparatus, terminating with a 2.50" (M) National Standard hose thread adapter.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

<p><b><u>RIGHT SIDE DISCHARGE OUTLETS</u></b>          There shall 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.</p> <p><b><u>LARGE DIAMETER DISCHARGE OUTLET</u></b>          There shall be a 4.00" discharge outlet with a 3.50" valve installed on the right side of the apparatus, terminating with a 4.00" (M) National Standard hose thread adapter. This discharge outlet shall be actuated with a handwheel control at the pump operator's control panel. An indicator shall be provided to show when the valve is in the closed position.</p> <p><b><u>REAR DISCHARGE OUTLET (REAR PASSENGER)</u></b>          There shall be one (1) discharge outlet piped to the rear of the hose bed, on passenger's side, installed so proper clearance is provided for spanner wrenches or adapters. Plumbing shall consist of 3.00" piping along with a 3.00" full flow ball valve with the control from the pump operator's panel.</p> <p><b><u>REAR DISCHARGE OUTLET (REAR DRIVERS)</u></b>          There shall be one (1) discharge outlet piped to the rear of the hose bed. Located on the driver's side. Proper clearance shall be provided for spanner wrenches or adapters. Plumbing shall consist of 3.00" piping along with a 3.00" full flow ball valve with the control from the pump operator's panel. The one (1) discharge outlet shall terminate with a 3.00" male National Standard hose thread male adapter.</p> <p><b><u>DISCHARGE CAPS</u></b>          Chrome plated, rocker lug, caps with chains shall be furnished for all side discharge outlets. The cap shall incorporate a thread design to automatically relieve stored pressure in the line when disconnected (no exception).</p> <p><b><u>OUTLET BLEEDERS</u></b>          A 0.75" bleeder valve shall 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 shall be located behind the panel with a swing style handle control extended to the outside of the side pump panel. The handles shall be chrome plated and provide a visual indication of valve position. The swing handle shall provide an ergonomic position for operating the valve without twisting the wrist and provides excellent leverage. Bleeders shall be located at the bottom of the pump panel. They shall be properly labeled identifying the discharge they are plumbed in to. The water discharged by the bleeders shall be routed below the chassis frame rails.</p>	
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**II. Minimum Specifications:**

Bidder Complies	
Yes	No

<p><b><u>LEFT SIDE OUTLET ELBOWS</u></b>  The 2.50" discharge outlets located on the left side pump panel shall 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 shall incorporate a thread design to automatically relieve stored pressure in the line when disconnected (no exception).</p> <p><b><u>RIGHT SIDE OUTLET ELBOWS</u></b>  The 2.50" discharge outlets located on the right side pump panel shall 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 shall incorporate a thread design to automatically relieve stored pressure in the line when disconnected (no exception).</p> <p><b><u>REAR OUTLET ELBOWS</u></b>  The 3.00" discharge outlets, located at the rear of the apparatus, shall be furnished with a 3.00" (F) National Standard hose thread x 3.00" (M) National Standard hose thread, chrome plated, 45 degree elbow. The elbow shall incorporate a thread design to automatically relieve stored pressure in the line when disconnected (no exception).</p> <p><b><u>ADDITIONAL REAR OUTLET ELBOWS</u></b>  The 3.00" discharge outlets, located at the rear of the apparatus, shall be furnished with a 3.00" (F) National Standard hose thread x 3.00" (M) National Standard hose thread chrome plated, 45 degree elbow. The elbow shall incorporate a thread design to automatically relieve stored pressure in the line when disconnected (no exception).</p> <p><b><u>LARGE DIAMETER OUTLET ELBOWS</u></b>  The 4.00" outlet(s) shall be furnished with one (1) 4.00" (F) National Standard hose thread x 5.00" Storz elbow adapter with Storz cap.</p> <p><b><u>ADAPTER</u></b>  There shall be two (2) adapters with 1.50" FNST X NPSH Pipe. These adapters shall be installed on the two (2) 1.75" xlays.</p> <p><b><u>DISCHARGE OUTLET CONTROLS</u></b>  The discharge outlets shall incorporate a quarter-turn ball valve with the control located at the pump operator's panel. The valve operating mechanism shall indicate the position of the valve. If a handwheel control valve is used, the control shall be a minimum of a 3.9" diameter stainless steel handwheel with a dial position indicator built in to the center of the handwheel.</p>	
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**II. Minimum Specifications:**

Bidder Complies	
Yes	No

**DELUGE RISER**

A 3.00" deluge riser shall be installed above the pump in such a manner that a monitor can be mounted and used effectively. Piping shall be installed securely so no movement develops when the line is charged. The riser shall be gated and controlled at the pump operator's panel. The deluge riser shall have male National Pipe Threads for mounting the monitor.

**CROSSLAY HOSE BEDS**

Two (2) crosslays with 1.50" outlets shall be provided. Each bed to be capable of carrying 200 feet of 1.75" double jacketed hose and shall be plumbed with 2.00" i.d. pipe and gated with a 2.00" quarter turn ball valve. Outlets to be equipped with a 1.50" National Standard hose thread 90 degree swivel located in the hose bed so that hose may be removed from either side of apparatus. The crosslay controls shall be at the pump operator's panel. The center crosslay dividers shall be a pan style, fabricated of .090 aluminum and shall provide adjustment from side to side. The divider shall be painted job color. The remainder of the crosslay bed shall be painted job color.

Stainless steel vertical scuffplates shall be provided at hose bed ends (each side of vehicle). Bottom of hose bed ends (each side) shall also be equipped with a stainless steel scuffplate. Crosslay bed flooring shall consist of removable perforated brushed aluminum.

**2.50" CROSSLAY HOSE BED**

One (1) crosslay with a 2.50" outlet shall be provided. The bed to be capable of carrying 200 feet of 2.50" double jacketed hose and shall be plumbed with 2.50" i.d. pipe and gated with a 2.50" quarter turn ball valve. The outlet to be equipped with a 2.50" National Standard hose thread 90 degree swivel located in the hose bed so that hose may be removed from either side of apparatus. The crosslay control shall be at the pump operator's panel. The center crosslay dividers shall be a pan style, fabricated of .090 aluminum and shall provide adjustment from side to side. The divider shall be painted job color. The remainder of the crosslay bed shall be painted job color.

Crosslay bed flooring shall consist of removable perforated brushed aluminum.

**CROSSLAY/DEADLAY HOSE RESTRAINT**

Elastic netting shall be provided across the top and ends of three (3) crosslay/deadlay opening(s) to secure the hose during travel. The netting shall be permanently attached at the top center of the crosslay/deadlay bed and removable on each end.

**CROSSLAY 8.00" LOWER THAN STANDARD**

The crosslays shall be lowered 8.00" from standard.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

<p><b><u>FOAM PROPORTIONER</u></b>  A foam proportioning system shall be provided that is an on demand, automatic proportioning, single point, direct injection system suitable for all types of Class A and B foam concentrates, including the high viscosity (6000 cps), alcohol resistant Class B foams. Operation shall be based on direct measurement of water flow, and remain consistent within the specified flows and pressures. The system shall automatically proportion foam solution at rates from .1 percent to 3.0 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 shall allow operation from draft, hydrant, or relay operation.</p> <p><b><u>SYSTEM CAPACITY</u></b>  The system shall have the ability to deliver the following minimum foam solution flow rates at accuracies that meet or exceed NFPA requirements at a pump rating of 150 psi.  100 gpm @ 3 percent  300 gpm @ 1 percent  600 gpm @ 0.5 percent  Class A foam setting in .1 percent increments from .1 percent to 1 percent. Typical settings of 1 percent, .5 percent and .3 percent (maximum capacity shall be limited to the plumbing and water pump capacity).</p> <p><b><u>CONTROL SYSTEM</u></b>  The system shall be equipped with a digital electronic control display located on the pump operators panel. Push button controls shall be integrated into the panel to turn the system on/off, control the foam percentage, and to set the operation modes.  The percent of injection shall have a preset. This preset can be changed at the fire department as desired. The percent of injection shall be able to be easily changed at the scene to adjust to changing demands.  Three (3) .50 tall LEDs shall display the foam percentage in numeric characters. Three (3) indicator LEDs shall also be included, one (1) green, one (1) red, and one (1) yellow. The LEDs shall indicate various system operation or error states.  The indications shall be:  Solid Green - System On  Solid Red - Valve Position Error  Solid Yellow - Priming System  Flashing Green - Injecting Foam  Flashing Red - Low Tank Level  Flashing Yellow - Refilling Tank</p>	
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**II. Minimum Specifications:**

Bidder Complies	
Yes	No

The control display shall house a microprocessor, which receives input from the systems water flow meter while also monitoring the position of the foam concentrate pump. The microprocessor shall compare the values of the water flow versus the position/rate of the foam pump, to ensure the proportion rate is accurate. One (1) check valve shall be installed in the plumbing to prevent foam from contaminating the water pump.

**HYDRAULIC DRIVE SYSTEM**

The foam concentrate pump shall be powered by an electric over hydraulic drive system. The hydraulic system and motor shall be integrated into one (1) unit.

**FOAM CONCENTRATE PUMP**

The foam concentrate pump shall be of positive displacement, self-priming; linear actuated design, driven by the hydraulic system. The pump shall be constructed of brass body; chrome plated stainless steel shaft, with a stainless steel piston. In order to increase longevity of the pump, no aluminum shall be present in its construction.

A relief system shall be provided which is designed to protect the drive system components and prevent over pressuring the foam concentrate pump. The foam concentrate pump shall have minimum capacity for 3 gpm with all types of foam concentrates with a viscosity at or below 6000 cps including protein, fluoroprotein, AFFF, FFFP, or AR-AFFF. The system shall deliver only the amount of foam concentrate flow required, without recirculating foam back to the storage tank. Recirculating foam concentrate back to the storage tank can cause agitation and premature foaming of the concentrate, which can result in system failure. The foam concentrate pump shall be self-priming and have the ability to draw foam concentrate from external supplies such as drums or pails.

**EXTERNAL FOAM CONCENTRATE CONNECTION**

An external foam pick-up shall be provided to enable use of a foam agent that is not stored on the vehicle. The external foam pick-up shall be designed to allow continued operation after the on-board foam tank is empty, or the use of foam different than the foam in the foam tank.

**PANEL MOUNTED EXTERNAL PICK-UP CONNECTION / VALVE**

A bronze three (3)-way valve shall be provided. The unit shall be mounted to the pump panel. The valve unit shall function as the foam system tank to pump valve and external suction valve. The external foam pick-up shall be one (1) .75" male connection GHT (garden hose thread) with a cap.

**II. Minimum Specifications:**

**Bidder Complies**

Yes	No
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**PICK-UP HOSE**

A .75" flexible hose with an end for insertion into foam containers shall be provided. The hose shall be supplied with a .75" female swivel GHT (garden hose thread) swivel connector. The hose shall be shipped loose.

**DISCHARGES**

The foam system shall be plumbed to the left rear outlet, front crosslay, center crosslay and rear crosslay.

**SYSTEM ELECTRICAL LOAD**

The maximum current draw of the electric motor and system shall be no more than 55 amperes at 12 VDC.

**SINGLE FOAM TANK REFILL**

The foam system's proportioning pump shall be used to fill the foam tank. This shall allow use of the auxiliary foam pick-up to pump the foam from pails or a drum on the ground into the foam tank. A foam shut-off switch shall be installed in the fill dome of the tank to shut the system down when the tank is full. The fill operation shall be controlled by a mode in the foam system controller. While the proportioner pump is filling the tank, the controller shall display a flashing yellow LED to indicate that the tank is filling. When the tank is full, as determined by the float switch in the tank dome, the pump shall stop and the controller shall shut the yellow LED off. If it attempted to use tank fill and the refill valve and suction valve are in the wrong position(s), then a red LED shall illuminate to indicate the improper valve position(s). When the valves are positioned properly, then filling shall commence.

**FOAM TANK**

The foam tank shall be an integral portion of the polypropylene water tank. The cell shall have a capacity of 20 gallons of foam with the intended use of Class A foam. The foam cell shall not reduce the capacity of the water tank. The foam cell shall have a screen in the fill dome and a breather in the lid.

**FOAM TANK DRAIN**

A system of 1.00" foam tank drains shall be provided, integrated into the foam systems strainer and tank to foam pump valve management system. The tank to pump hoses running from the tank(s) to the panel mounted strainer shall 1.00" diameter. The foam system controller shall have a mode that allows for a given foam valve to be opened at will. Flow of foam from the tank valve to the strainer shall be usable as a tank drain mode. An adaptor shall be supplied, that allows the 1.00" foam intake screen to assembly to be used as a drain outlet. The standard supplied 1.00" foam pick up hose shall be attached to the screen assembly by way of the adapter. The drain mode shall allow the operator to open

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

and close the tank valve as required from the control head, to drain foam and re-fill foam containers through the connected hose, without foam spillage beneath the vehicle.

**PUMP COMPARTMENT**

The pump compartment shall be separate from the hose body and compartments so that each may flex independently of the other. It shall be a fabricated assembly of steel tubing, angles and channels which supports both the fire pump and the side running boards. The pump compartment shall be mounted on the chassis frame rails with rubber biscuits in a four point pattern to allow for chassis frame twist. Pump compartment, pump, plumbing and gauge panels shall be removable from the chassis in a single assembly.

**PUMP MOUNTING**

Pump shall be mounted to a substructure which shall be mounted to the chassis frame rail using rubber isolators. The mounting shall allow chassis frame rails to flex independently without damage to the fire pump.

**LEFT SIDE PUMP CONTROL PANELS**

All pump controls and gauges shall be located at the left (driver's) side of the apparatus and properly identified. Layout of the pump control panel shall be ergonomically efficient and systematically organized. The pump operator's control panel shall be removable in two (2) main sections for ease of maintenance: The upper section shall contain sub panels for the mounting of the pump pressure control device, engine monitoring gauges, electrical switches, and foam controls (if applicable). Sub panels shall be removable from the face of the pump panel for ease of maintenance. Below the sub panels shall be located all valve controls and line pressure gauges.

The lower section of the panel shall contain all inlets, outlets, and drains. All push/pull valve controls shall have 1/4 turn locking control rods with polished chrome plated zinc tee handles. Guides for the push/pull control rods shall be chrome plated zinc castings securely mounted to the pump panel. Push/pull valve controls shall be capable of locking in any position. The control rods shall pull straight out of the panel and shall be equipped with universal joints to eliminate binding.

**IDENTIFICATION TAGS**

The identification tag for each valve control shall be recessed in the face of the tee handle. All discharge outlets shall have color coded identification tags, with each discharge having its own unique color. Color coding shall include the labeling of the outlet and the drain for each corresponding discharge. All line pressure gauges shall be mounted directly above the corresponding discharge control tee handles and recessed within the same chrome plated casting as the rod guide for quick identification. The gauge and rod guide casting shall be removable from the face of the pump panel for ease of maintenance. The casting shall be color coded to correspond with the discharge identification tag. All remaining identification

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

tags shall be mounted on the pump panel in chrome plated bezels. The pump panel on the right (passenger's) side shall be removable with lift and turn type fasteners. Trim rings shall be installed around all inlets and outlets. The trim rings for the side discharge outlets shall be color coded and labeled to correspond with the discharge identification tag.

**PUMP PANEL CONFIGURATION**

The pump panel configuration shall be arranged and installed in an organized manner that shall provide user-friendly operation.

**PUMP AND GAUGE PANEL**

The pump and gauge panels shall be constructed of aluminum with a painted FormCoat black finish. A polished aluminum trim molding shall be provided around each panel. The passenger's side pump panel shall be removable and fastened with swell type fasteners.

**PUMP COMPARTMENT LIGHT**

There shall be one (1) 3.00" white 12 volt DC LED light(s) with flange(s) installed in the pump compartment. There shall be a switch accessible through a door on the pump panel included with this installation. Engine monitoring graduated LED indicators shall be incorporated with the pressure controller. Also provided at the pump panel shall be the following:

- Master Pump Drain Control

**AIR HORN BUTTON**

An air horn control button shall be provided at the pump operator's control panel. This button shall be red in color and properly labeled "Evacuation".

**VACUUM AND PRESSURE GAUGES**

The pump vacuum and pressure gauges shall be liquid filled. The gauges shall be a minimum of 4.00" in diameter and shall have white faces with black lettering, with a pressure range of 30.00"-0-600#. Gauge construction shall include a Zytel nylon case with adhesive mounting gasket and threaded retaining nut. The pump pressure and vacuum gauges shall be installed adjacent to each other at the pump operator's control panel. Test port connections shall be provided at the pump operator's panel. One (1) shall be connected to the intake side of the pump, and the other to the discharge manifold of the pump. They shall have 0.25 in. standard pipe thread connections and non-corrosive polished stainless steel or brass plugs. They shall be marked with a label. This gauge shall include a 10 year warranty against leakage, pointer defect, and defective bourdon tube.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

<p><b><u>PRESSURE GAUGES</u></b>          The individual "line" pressure gauges for the discharges shall be interlube filled. They shall be a minimum of 2.00" in diameter and shall have white faces with black lettering. Gauge construction shall include a Zytel nylon case with adhesive mounting gasket and threaded retaining nut. Gauges shall have a pressure range of 30"-0-400#. The individual pressure gauge shall be installed as close to the outlet control as practical. This gauge shall include a 10 year warranty against leakage, pointer defect, and defective bourdon tube.</p> <p><b><u>WATER LEVEL GAUGE</u></b>          An electric water level gauge shall be incorporated in the pressure controller that registers water level by means of 9 LEDs. They shall be at 1/8 level increments with a tank empty LED. The LEDs shall be a bright type that is readable in sunlight, and have a full 180-degree of clear viewing. To further alert the pump operator, the gauge shall have a warning flash when the tank volume is less than 25%, and shall have "Down Chasing LEDs when the tank is almost empty. The level measurement shall be ascertained by sensing the head pressure of the fluid in the tank or cell.</p> <p><b><u>WATER LEVEL GAUGE, CAB SIDES</u></b>          A water level gauge system shall be provided at one (1) each side on the crew cab Extension and (1) mounted on rear of truck. Each system shall be provided with four (4) vertical mounted LED lights with flanges. The total quantity of the water level gauge systems to be provided shall be three (3). The following lights shall be mounted and indicate the following:          Top light with green LED light with green lens Water tank level full          Second light with blue LED light with blue lens Water tank level 3/4 full          Third light with amber LED light with amber lens Water tank level 1/2 full          Bottom light with red LED light with red lens Water tank level 1/4 full when on solid and shall flash when empty          The above system shall function similar to the standard five (5) light at the pump panel. The system shall activate when the ignition switch is activated.</p> <p><b><u>FOAM LEVEL GAUGE</u></b>          An electronic foam level gauge shall be provided on the operator's panel that registers foam level by means of five (5) colored LED lights. The lights shall be durable, ultrabright five (5) LED design viewable through 180 degrees. The foam level indicators shall be as follows:  <input type="checkbox"/> 100 percent = Green  <input type="checkbox"/> 75 percent = Yellow  <input type="checkbox"/> 50 percent = Yellow  <input type="checkbox"/> 25 percent = Yellow  <input type="checkbox"/> Refill = Red</p>	
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**II. Minimum Specifications:**

Bidder Complies	
Yes	No

The light shall 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 shall flash sequentially when the foam tank is empty. The level measurement shall be based on the sensing of head pressure of the fluid in the tank. The display shall 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 shall provide complete protection from foam and environmental elements. An industrial pressure transducer shall be mounted to the outside of the tank. The display shall be able to be calibrated in the field and shall measure head pressure to accurately show the tank level.

**STEP/LIGHT SHIELD**

There shall be an aluminum treadplate stepping surface no less than 8.00" deep and properly reinforced to support a man's weight, installed over the pump operator's panel.

There shall 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 shall be activated by the pump panel light switch. Additional lights shall be included every 18.00" depending on the size of the pump house.

One (1) pump panel light shall come on when the pump is in ok to pump mode.

There shall be a light activated above the pump panel light switch when the parking brake is set. This is to afford the operator some illumination when first approaching the control panel. There shall 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. There shall be one (1) white LED, step light provided above this step. In order to ensure exceptional illumination, each step light shall provide a minimum of 25 footcandles (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 shall be activated by the pump panel light switch.

**ADDITIONAL STEP/LIGHT SHIELD**

There shall be a polished, 16 gauge stainless steel light shield installed under the crosslays. This shield shall be properly reinforced to support the crosslay hose weight.

There shall be two (2) 12 volt DC white LED light(s) installed under the stainless steel light shield.  These lights shall be activated when the battery switch is on and the pump panel light switch is on. There shall be an aluminum treadplate stepping surface no less than 8.00" deep and properly reinforced to support a man's weight, installed over the pump operators main panel.

There shall 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 shall be activated by the pump panel light switch. Additional lights shall be included every 18.00" depending on the size of the pump house.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

One (1) pump panel light shall come on when the pump is in ok to pump mode. There shall be one (1) white LED, step light provided above this step. In order to ensure exceptional illumination, each step light shall provide a minimum of 25 footcandles (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 shall be activated by the pump panel light switch.

**AIR HORN SYSTEM**

There shall be two (2) air horns provided and located in the front bumper, recessed to the outside of the frames. The horn system shall be piped to the air brake system wet tank utilizing 0.38" tubing. A pressure protection valve shall be installed in-line to prevent loss of air in the air brake system.

**AIR HORN CONTROL**

Two (2) lanyard rope pull controls shall be provided, one (1) within reach of the driver and one (1) within reach of the officer.

**ELECTRONIC SIREN**

An electronic siren (Whelen 295SLSA1) with noise canceling microphone shall be provided. This siren to be active when the battery switch is on and that emergency master switch is on. Siren head shall be located on a swivel bracket mounted on the headliner so that it is accessible to both the driver and officer. The swivel bracket shall be capable of rotating a minimum of 180 degrees. The electronic siren shall be controlled on the siren head only. No horn button or foot switches shall be required.

**SPEAKER**

There shall be two (2) Whelen SA315P speakers provided. Each speaker shall be a black nylon composite, 100-watt, with through bumper mounting brackets and polished stainless steel grille. Each speaker shall be connected to the siren amplifier. There shall be one (1) speaker recessed in the passenger's side and one (1) speaker recessed in the driver's side of the front bumper.

**AUXILIARY MECHANICAL SIREN**

A mechanical Federal Q2B siren shall be furnished, a siren brake button shall be installed on the switch panel. The control solenoid shall be powered up after the emergency master switch is activated. The mechanical siren shall be recessed in the front bumper in the center. The siren shall be supported by the bumper framework. The mechanical siren shall be actuated by a chrome push button located on the officer side of the engine tunnel and by the horn button in the steering wheel. The driver shall have the option to control the siren or the chassis horn from the horn button by means of a selector switch located on the instrument panel. A second siren brake switch shall be installed on the passenger side.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

**LIGHTBAR, CAB ROOF**

A 72.00" LED Whelen FN72QLED lightbar shall be mounted on the cab roof.

The lightbar shall include the following:

- Four (4) red flashing LED modules facing forward.
- Four (4) white flashing LED modules facing forward.
- Two (2) red flashing corner LED modules, one (1) in each front corner.
- One (1) red flashing LED module on the end, facing the driver side.
- One (1) red flashing LED module on the end, facing the passenger side.
- One (1) GTE Traffic Emitter, Front Light Bar, Light bar to have GTT 795H LED Emitter Opticom.

All the lenses shall be the same color as the LED's.

There shall be a switch located in the cab on the switch panel to control the lightbar.

To meet NFPA, all white flashing lights shall be disabled when the parking brake is Applied

**CAB FACE WARNING LIGHTS**

There shall be four (4) LED Whelen M6C flashing warning lights installed on the cab face, above the headlights, mounted in a common bezel.

- The driver's side front outside warning light to be red
- The driver's side front inside warning light to be red
- The passenger's side front inside warning light to be red
- The passenger's side front outside warning light to be red

All four (4) lights shall include a clear lens.

There shall be a switch located in the cab, on the switch panel, to control the four (4) lights. The inside lights may be load managed if colored or disabled if white, when the parking brake is set.

**HEADLIGHT FLASHER**

The high beam headlights shall flash alternately between the left and right side.

There shall be a switch installed in the cab on the switch panel to control the high beam flash. This switch shall be live when the battery switch and the emergency master switches are on. The flashing shall automatically cancel when the hi-beam headlight switch is activated or when the parking brake is set.

**SIDE ZONE LOWER LIGHTING**

There shall be six (6) LED Whelen M6 flashing warning lights with chrome flanges located in the following positions:

- Two (2) lights, one (1) each side on the bumper extension
  - The side front lights to be red
- Two (2) lights, one (1) each side of cab rearward of crew cab doors
  - The side middle lights to be red

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

Two (2) lights, one (1) each side located between the tandems  
 The side rear lights to be red  
 All six (6) lights shall include a lens that is the same color of the LED's.  
 There shall be a switch located in the cab on the switch panel to control the lights.

**REAR ZONE LOWER LIGHTING**

There shall be two (2) LED Whelen M6 flashing warning lights shall be located at the rear of the apparatus.

- The driver's side rear light to be red
- The passenger's side rear light to be red

Both lights shall include a lens that is the same color as the LED's.  
 There shall be a switch located in the cab on the switch panel to control the lights.

**WARNING LIGHTS (REAR AND SIDE UPPER ZONES)**

Four (4) LED Whelen M6 flashing warning lights shall be provided at the rear of the apparatus with chrome flanges.  
 The side rear upper light(s) on the driver's side to be red.  
 The rear upper light(s) on the driver's side to be red.  
 The rear upper light(s) on the passenger's side to be red.  
 The side rear upper light(s) on the passenger's side to be red.  
 These lights shall include a lens that is the same color as the LED's.  
 There shall be a switch located in the cab on the switch panel to control the lights.  
 The rear warning lights shall be mounted on stainless steel brackets with all wiring totally enclosed. These brackets shall also support the rear deck lights and clearance/marker lights. The rear warning lights shall be mounted on aluminum treadplate boxes with all wiring totally enclosed. These boxes shall also support the clearance/marker lights as well as the M6ZC LED 15 degree rear scene lights.

**TRAFFIC DIRECTING LIGHT**

There shall be one (1) Whelen Traffic Advisor 36.01" long x 2.84" high x 2.24" deep, amber LED traffic directing light installed at the rear of the apparatus.  
 The control head shall be included with this installation. The auxiliary warning mode shall be activated with the control head only. This traffic directing light shall be recessed with a stainless steel trim plate at the rear of the apparatus as high as practical. The traffic directing light control head shall be located in the driver side overhead switch panel in the right panel position.

**LOOSE EQUIPMENT**

The following equipment shall 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.

**II. Minimum Specifications:**

**Bidder Complies**

**Yes      No**

**PORTABLE FOLDING TANK**

A quantity of one (1) 2500 gallon portable water tanks with a 22oz yellow high performance rubber liner shall be provided. The collapsed dimensions shall be 12' 3.00" long x 8.00" wide x 29.00" deep. The expanded size shall be 12' 3.00" long x 12' 3.00" wide x 29.00" deep.

**NFPA REQUIRED LOOSE EQUIPMENT PROVIDED BY FIRE DEPARTMENT**

The following loose equipment as outlined in NFPA 1901, 2009 edition, section 5.8.2 and 5.8.3 shall be provided by the fire department. All loose equipment shall be installed on the apparatus before placed in emergency service, unless the fire department waives NFPA section 4.21.

- 800 ft (60 m) of 2.50" (65 mm) or larger fire hose.
- 400 ft (120 m) of 1.50 (38 mm), 1.75" (45 mm), or 2.00" (52 mm) fire hose.
- One (1) handline nozzle, 200 gpm (750 L/min) minimum.
- Two (2) handline nozzles, 95 gpm (360 L/min) minimum.
- One (1) playpipe with shutoff and 1.00" (25 mm), 1.125" (29 mm), and 1.25" (32 mm) tips.
- One (1) SCBA complying with NFPA 1981, Standard on Open-Circuit Self-Contained Breathing Apparatus for Fire and Emergency Services, for each assigned seating position, but not fewer than four (4), mounted in brackets fastened to the apparatus or stored in containers supplied by the SCBA manufacturer.
- One (1) spare SCBA cylinder for each SCBA carried, each mounted in a bracket fastened to the apparatus or stored in a specially designed storage space(s).
- One (1) first aid kit.
- Four (4) combination spanner wrenches mounted in bracket(s) fastened to the apparatus.
- Two (2) hydrant wrenches mounted in brackets fastened to the apparatus.
- Four (4) ladder belts meeting the requirements of NFPA 1983, Standard on Fire Service Life Safety Rope and System Components (if equipped with an aerial device).
- One (1) double female 2.50" (65 mm) adapter with National Hose threads, mounted in a bracket fastened to the apparatus.
- One (1) double male 2.50" (65 mm) adapter with National Hose threads, mounted in a bracket fastened to the apparatus.
- One (1) rubber mallet, for use on suction hose connections, mounted in a bracket fastened to the apparatus.
- Two (2) salvage covers each a minimum size of 12 ft x 14 ft (3.7 m x 4.3 m).
- One (1) traffic vest for each seating position, each vest to comply with ANSI/ISEA 207, Standard for High Visibility Public Safety Vests, and have a five-point breakaway feature that includes two at the shoulders, two at the sides, and one at the front.
- Five (5) fluorescent orange traffic cones not less than 28.00" (711 mm) in height, each equipped with a 6.00" (152 mm) retro-reflective white band no more than 4.00" (152 mm)

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

from the top of the cone, and an additional 4.00" (102 mm) retro-reflective white band 2.00" (51 mm) below the 6.00" (152 mm) band.

- Five (5) illuminated warning devices such as highway flares, unless the five (5) fluorescent orange traffic cones have illuminating capabilities.
- One automatic external defibrillator (AED).
- If the supply hose carried does not use sexless couplings, an additional double female adapter and double male adapter, sized to fit the supply hose carried, shall be carried mounted in brackets fastened to the apparatus.
- If none of the pump intakes are valved, a hose appliance that is equipped with one or more gated intakes with female swivel connection(s) compatible with the supply hose used on one side and a swivel connection with pump intake threads on the other side shall be carried. Any intake connection larger than 3.00" (75 mm) shall include a pressure relief device that meets the requirements of 16.6.6.
- If the apparatus does not have a 2.50" National Hose (NH) intake, an adapter from 2.50" NH female to a pump intake shall be carried, mounted in a bracket fastened to the apparatus if not already mounted directly to the intake.
- If the supply hose carried has other than 2.50" National Hose (NH) threads, adapters shall be carried to allow feeding the supply hose from a 2.50" NH thread male discharge and to allow the hose to connect to a 2.50" NH female intake, mounted in brackets fastened to the apparatus if not already mounted directly to the discharge or intake.

**SOFT SUCTION HOSE**

There shall be no soft suction hose provided.

- One (1)-6.00" National Standard hose thread barrel strainer, chrome plated.

**DRY CHEMICAL EXTINGUISHER PROVIDED BY FIRE DEPARTMENT**

NFPA 1901, 2009 edition, section 5.8.3 requires one (1) approved dry chemical portable fire extinguisher with a minimum 80-B:C rating mounted in a bracket fastened to the apparatus. The extinguisher is not on the apparatus as manufactured. The fire department shall provide and mount the extinguisher.

**WATER EXTINGUISHER PROVIDED BY FIRE DEPARTMENT**

NFPA 1901, 2009 edition, section 5.8.3 requires one (1) 2.5 gallon or larger water extinguisher mounted in a bracket fastened to the apparatus. The extinguisher is not on the apparatus as manufactured. The fire department shall provide and mount the extinguisher.

**FLATHEAD AXE PROVIDED BY FIRE DEPARTMENT**

NFPA 1901, 2009 edition, Section 5.8.3 requires one (1) flathead axe mounted in a bracket fastened to the apparatus. The axe is not on the apparatus as manufactured. The fire department shall provide and mount the axe.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

<b><u>PAINT</u></b>		
<p>The exterior custom cab and body painting procedure shall consist of a seven (7) step finishing process as follows:</p> <ol style="list-style-type: none"> <li>1. Manual Surface Preparation - All exposed metal surfaces on the custom cab and body shall be thoroughly cleaned and prepared for painting. Imperfections on the exterior surfaces shall be removed and sanded to a smooth finish. Exterior seams shall be sealed before painting. Exterior surfaces that shall not be painted include; chrome plating, polished stainless steel, anodized aluminum and bright aluminum treadplate.</li> <li>2. Chemical Cleaning and Pretreatment - All surfaces shall be chemically cleaned to remove dirt, oil, grease, and metal oxides to ensure the subsequent coatings bond well. The aluminum surfaces shall be properly cleaned and treated using a high pressure, high temperature 4 step Acid Etch process. The steel and stainless surfaces shall 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. A final pure water rinse shall be applied to all metal surfaces.</li> <li>3. Surfacer Primer - The Surfacer Primer shall 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.</li> <li>4. Finish Sanding - The Surfacer Primer shall 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.</li> <li>5. 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 topcoated.</li> <li>6. Basecoat Paint - Two coats of a high performance, two component high solids polyurethane basecoat shall be applied. The Basecoat shall be applied to a thickness that shall achieve the proper color match. The Basecoat shall be used in conjunction with a urethane clear coat to provide protection from the environment.</li> <li>7. Clear Coat - Two (2) coats of Clear Coat shall 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 shall be Clear Coated to match the body. Paint warranty for the roll-up doors shall be provided by the roll-up door manufacture.</li> </ol> <p>All removable items such as brackets, compartment doors, door hinges, and trim shall be removed and separately if required, to ensure paint behind all mounted items. Body assemblies that cannot be finish painted after assembly shall be finish painted before assembly. The cab shall be two-tone, with the upper section painted #10 white and lower section of the cab and body painted #50 red.</p>		

**II. Minimum Specifications:**

**Bidder Complies**

**Yes      No**

**PAINT - ENVIRONMENTAL IMPACT**

Contractor shall meet or exceed all current State regulations concerning paint operations. Pollution control shall include measures to protect the atmosphere, water and soil. Controls shall include the following conditions:

- Topcoats and primers shall be chrome and lead free.
- Metal treatment chemicals shall be chrome free. The wastewater generated in the metal treatment process shall be treated on-site to remove any other heavy metals.
- Particulate emission collection from sanding operations shall have a 99.99% efficiency factor.
- Particulate emissions from painting operations shall be collected by a dry filter or water wash process. If the dry filter is used, it shall have an efficiency rating of 98.00%. Water wash systems shall be 99.97% efficient.
- Water from water wash booths shall be reused. Solids shall be removed on a continual basis to keep the water clean.
- Paint wastes are disposed of in an environmentally safe manner.
- Empty metal paint containers shall be to recover the metal.
- Solvents used in clean-up operations shall be recycled on-site or sent off-site for distillation and returned for reuse.

Additionally, the finished apparatus shall not be manufactured with or contain products that have ozone depleting substances. Contractor shall, 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.

**PAINT/SEAL CHASSIS FRAME ASSEMBLY**

The following components shall be treated with epoxy E-coat protection prior to finish paint:

- Two (2) C-channel frame rails
- Two (2) frame liners

Before the frame rails are finish painted, all areas shall be sealed with a 3M 2084 metal sealant after the components are torqued to the frame rails:

- The joint between the main frame and the liner
- The joint between all crossmembers and the frame
- The joint between all spring hangers and the frame.

The chassis frame assembly shall be finish painted black before the installation of the cab and body, and before installation of the engine and transmission assembly, air brake lines, electrical wire harnesses, etc. Components that are included with the chassis frame assembly that shall be finish painted are:

- Frame rails
- Frame liners
- Cross members
- Axles

**II. Minimum Specifications:**

**Bidder Complies**

**Yes      No**

- Suspensions
- Steering gear
- Battery boxes
- Bumper extension weldment
- Frame extensions
- Body mounting angles
- Rear Body support substructure (front and rear)
- Pump house substructure
- Air tanks
- Fuel tank
- Castings
- Individual piece parts used in chassis and body assembly

After the chassis frame assembly is finish painted, the following non-torqued joints shall be sealed with a SG-510A rust-proofing compound:

-All bolted on chassis components that could be vulnerable to rust, i.e. body mounting angles, air tanks, etc. To summarize, all metal to metal contact components that are prone to rust, shall be protected.

**PAIN, FRONT WHEELS**

All wheel surfaces, inside and outside, shall be provided with powder coat paint #50 red.

**PAIN, REAR WHEELS**

All wheel surfaces, inside and outside, shall be provided with powder coat paint #50 red.

**COMPARTMENT INTERIOR PAINT**

The interior of compartmentation shall be painted with a gray spatter type paint.

**REFLECTIVE STRIPES**

Three (3) reflective vinyl stripes shall be provided across the front of the vehicle and along the sides of the cab and body.

Where installed on a painted surface, the reflective band shall consist of a 1.00" gold stripe at the top with a 1.00" gap then a 6.00" white stripe with a 1.00" gap and a 1.00" gold stripe on the bottom. When installed on a roll-up door, the reflective band shall consist of a 1.00" gold stripe at the top with a 1.00" gap then a 6.00" white stripe with a 1.00" gap and a 1.00" gold stripe on the bottom. The reflective band provided on the cab face shall be at the headlight level.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

**CHEVRON STRIPING, REAR**

There shall be alternating chevron striping located on the rear-facing vertical surface of the apparatus. The colors shall be red and fluorescent yellow diamond grade. Each stripe shall be 6.00" in width. This shall meet the requirements of NFPA 1901, 2009 edition, which states that 50% of the rear surface shall be covered with chevron striping.

**REFLECTIVE STRIPE, CAB DOORS**

A 6.00" x 16.00" white reflective stripe shall be provided across the interior of each cab door. The stripe shall be located approximately 1.00" up from the bottom, on the door panel. This stripe shall meet the NFPA 1901 requirement.

**BODY STRIPE**

There shall be a genuine gold leaf stripe around the top, bottom, front and rear edges of the body compartments with scrolls in each corner.

**CAB STRIPE**

There shall be a genuine gold leaf stripe located just below the window line on each side of the cab.

**CAB STRIPE**

There shall be a genuine gold leaf stripe on each side of the cab, low and over the fender.

**CAB FACE STRIPE**

There shall be a genuine gold leaf striped corner design on each front corner of the cab.

**LETTERING**

The lettering shall be totally encapsulated between two (2) layers of clear vinyl.

**LETTERING**

Eighty-one (81) to one hundred (100) genuine gold leaf lettering, 3.00" high, with highlight and shade shall be provided.

**DECAL INSTALLATION**

There shall be two (2) pair of decals furnished by the fire department and applied by the apparatus manufacturer.

**CAB GRILLE DESIGN**

An American flag design shall be painted on the cab grille.

**II. Minimum Specifications:**

**Bidder Complies**

**Yes      No**

**E-COAT - FRONT AXLE**

The following front axle components shall be treated with an epoxy E-coat to provide resistance to corrosion and chemicals:

Weldments (side plates and side plate interconnecting structure members)

Torsion bar anchor weldments.

After being treated with E-coat, components shall be finish painted black.

**E-COATING OF STEEL COMPONENTS**

The following components shall be treated with an epoxy E-coat to provide resistance to corrosion and chemicals:

Cross members

TAK-4® weldments (side plates and side plate interconnecting structure members) (if applicable)

Torsion bar anchor weldments (if applicable)

Battery boxes

Bumper extension weldment

Frame extensions

Body mounting angles

Rear body support weldment

Under body support weldments (front and rear)

Pump house substructure (walkway if applicable)

The following components shall not be e-coated:

Air tanks

Fuel tank

Castings

Individual piece parts used in chassis and body assembly.

The e-coated parts shall have a black top coat as well to provide an additional layer of protection and provide a consistent finish.

**RUSTPROOFING/UNDERCOATING**

The apparatus cab shall be properly treated by an authorized dealer.

The rust proofing material shall be a transparent coating of an organic based corrosion inhibitor for long-term protection against corrosion.

The rust proofing material utilized shall be formulated to resist corrosion.

Coating texture shall be waxy and pliable after drying so it shall not chip, crack, or peel off during normal vehicle operations. Minimum dry film thickness shall be in the range of 3.00 to 4.00 mils. The underside of the apparatus shall be undercoated with an asphalt petroleum based material, dark in color. The undercoating material utilized on the apparatus shall be formulated to resist corrosion and deaden unwanted sound or road noise. Coating texture shall appear firm, flexible, and resistant to abrasion. Minimum dry

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

film thickness shall be in the range of 8.00 to 12.00 mils. The material shall be applied to the following areas:

- Interior of all double panel style body doors.
- Body and cab wheel well fender liners, on the back side only.
- Underside of body and cab sheet metal, and structural components.
- Underside and vertical sides of all sheet metal compartmentation, including support angles.
- Structural support members under running boards, rear platforms, battery boxes, walkways, etc. Inside surfaces of the pump heat enclosure, (when installed).

**FIRE APPARATUS PARTS CD MANUAL**

There shall be two (2) custom parts manuals for the complete fire apparatus provided in CD format with the completed unit.

The manuals shall contain the following:

- Job number
- Part numbers with full descriptions
- Table of contents
- Parts section sorted in functional groups reflecting a major system, component, or assembly
- Parts section sorted in alphabetical order
- Instructions on how to locate parts

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

**SERVICE PARTS INTERNET SITE**

The service parts information included in these manuals are also available on the factory 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.

**CHASSIS SERVICE CD MANUALS**

There shall be two (2) CD format chassis service manuals containing parts and service information on major components provided with the completed unit.

The manual shall contain the following sections:

- Job number
- Table of contents
- Troubleshooting
- Front Axle/Suspension
- Brakes
- Engine Tires
- Wheels
- Cab

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

- Electrical, DC
- Air Systems
- Plumbing
- Appendix

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

**CHASSIS OPERATION CD MANUALS**

There shall be two (2) CD format chassis operation manuals provided.

**ONE (1) YEAR MATERIAL AND WORKMANSHIP**

Each new piece of apparatus shall be provided with a minimum **one (1) year** basic apparatus material and workmanship limited warranty. The warranty shall cover such portions of the apparatus built by the manufacturer as being free from defects in material and workmanship that would arise under normal use and service. A copy of the warranty certificate shall be submitted with the bid package (no exception).

**ENGINE WARRANTY**

A **five (5) year** limited engine warranty shall be provided. A copy of the warranty certificate shall be submitted with the bid package.

**STEERING GEAR WARRANTY**

A **three (3) year** limited steering gear warranty shall be provided. A copy of the warranty certificate shall be submitted with the bid package.

**FIFTY (50) YEAR STRUCTURAL INTEGRITY**

The chassis frame shall be provided with a **fifty (50) year** material and workmanship limited warranty. The warranty shall cover the chassis frame as being free from defects in material and workmanship that would arise under normal use and service.

A copy of the warranty certificate shall be submitted with the bid package (no exception).

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

Independent front suspension shall be provided with a **three (3) year** material and workmanship limited warranty. The manufacturer's warranty shall provide that the independent front suspension and steering gears be free from any defect related to material and workmanship on the portion of the apparatus built by the manufacturer that would arise under normal use and service. A copy of the warranty certificate shall be submitted with the bid package (no exception).

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

**REAR AXLE TWO (2) YEAR MATERIAL AND WORKMANSHIP WARRANTY**

A **two (2) year** axle limited warranty shall be provided.

**BRAKE SYSTEM THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY**

A **three (3) year** brake system limited warranty shall be provided.

**TEN (10) YEAR STRUCTURAL INTEGRITY**

The new cab shall be provided with a **ten (10) year** material and workmanship limited warranty. The warranty shall cover such portions of the cab built by the manufacturer as being free from structural failures caused by defects in material and workmanship that would arise under normal use and service. A copy of the warranty certificate shall be submitted with the bid package (no exception).

**TEN (10) YEAR PAINT AND CORROSION**

Each new piece of apparatus shall be provided with a ten (10) year paint and corrosion limited warranty on the apparatus cab. The warranty shall cover painted exterior surfaces of the body to be free from blistering, peeling, corrosion, or any other adhesion defect caused by defective manufacturing methods or paint material selection that would arise under normal use and service. A copy of the warranty certificate shall be submitted with the bid package (no exception).

**FIVE (5) YEAR MATERIAL AND WORKMANSHIP**

The electronic modules and display(s) shall be provided with a five (5) year material and workmanship limited warranty. The warranty shall cover electronic modules to be free from failures caused by defects in material and workmanship. A copy of the warranty certificate shall be submitted with the bid package (no exception).

**CAMERA SYSTEM WARRANTY**

A fifty four (54) month warranty shall be provided for the camera system.

**COMPARTMENT LIGHT WARRANTY**

A ten (10) year material and workmanship limited warranty shall be provided for the Pierce 12 volt DC LED strip lights. The warranty shall cover the LED strip lights to be free from defects in material and workmanship that would arise under normal use. A copy of the warranty certificate shall be submitted with the bid package (no exception).

**TRANSMISSION WARRANTY**

The transmission shall have a **five (5) year/unlimited mileage** warranty covering 100 percent parts and labor. The warranty is to be provided by transmission supplier and not the apparatus builder.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

**TRANSMISSION COOLER WARRANTY**

The transmission cooler shall carry a five (5) year parts and labor warranty (exclusive to the transmission cooler). In addition, a collateral damage warranty shall also be in effect for the first three (3) years of the warranty coverage and shall not exceed \$10,000 per occurrence. A copy of the warranty certificate shall be submitted with the bid package.

**WATER TANK WARRANTY**

The poly water tank shall be provided with a lifetime material and workmanship limited warranty. A copy of the warranty certificate shall be submitted with the bid package (no exception).

**FIVE (5) YEAR STRUCTURAL INTEGRITY**

Each new piece of apparatus shall be provided with a five (5) year material and workmanship limited warranty on the apparatus body. The warranty shall cover such portions of the apparatus built by the manufacturer as being free from defects in material and workmanship that would arise under normal use and service. A copy of the warranty certificate shall be submitted with the bid package (No Exception).

**PUMP WARRANTY**

The pump shall be provided with a **five (5) year** material and workmanship limited warranty. A copy of the warranty certificate shall be submitted with the bid package (no exception).

**TEN (10) YEAR PUMP PLUMBING WARRANTY**

The stainless steel plumbing components and ancillary brass fittings used in the construction of the water/foam plumbing system shall be warranted for a period of **ten (10) years or 100,000 miles**. This covers structural failures caused by defective design or workmanship, or perforation caused by corrosion, provided the apparatus is used in a normal and reasonable manner. This warranty is extended only to the original purchaser for a period of ten years from the date of delivery. A copy of the warranty certificate shall be submitted with the bid package (no exception).

**FOAM SYSTEM WARRANTY**

A **one (1) year** material and workmanship limited warranty shall be provided on the foam system. A **five (5) year** material and workmanship limited warranty shall be provided on the foam system control head. A copy of the warranty certificate shall be submitted with the bid package (no exception).

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

**TEN (10) YEAR PAINT AND CORROSION**

Each new piece of apparatus shall be provided with a ten (10) year paint and corrosion limited warranty on the apparatus body. The warranty shall cover painted exterior surfaces of the body to be free from blistering, peeling, corrosion, or any other adhesion defect caused by defective manufacturing methods or paint material selection that would arise under normal use and service. A copy of the warranty certificate shall be submitted with the bid package (No Exception).

**THREE (3) YEAR MATERIAL AND WORKMANSHIP**

The gold leaf lamination shall be provided with a **three (3) year** material and workmanship limited warranty. The warranty shall cover the gold leaf lamination as being free from defects in material and workmanship that would arise under normal use and service. A copy of the warranty certificate shall be submitted with the bid package (no exception).

**VEHICLE STABILITY CERTIFICATION**

The fire apparatus manufacturer shall provide a certification stating the apparatus complies with NFPA 1901, current edition, section 4.13, Vehicle Stability. The certification shall be provided at the time of bid.

**ENGINE INSTALLATION CERTIFICATION**

The fire apparatus manufacturer shall provide a certification, along with a letter from the engine manufacturer stating they approve of the engine installation in the bidder's chassis. The certification shall be provided at the time of bid.

**POWER STEERING CERTIFICATION**

The fire apparatus manufacturer shall provide a certification stating the power steering system as installed meets the requirements of the component supplier. The certification shall be provided at the time of bid.

**CAB INTEGRITY CERTIFICATION**

The fire apparatus manufacturer shall provide, at the time of bid, a cab crash test certification. There shall be no exception to any portion of the cab integrity certification. Nonconformance shall lead to immediate rejection of bid.

**CAB DOOR DURABILITY CERTIFICATION**

Robust cab doors help protect occupants. Cab doors shall survive a 200,000 cycle door slam test where the slamming force exceeds 20 G's of deceleration. The bidder shall 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.

**II. Minimum Specifications:**

Bidder Complies	
Yes	No

**WINDSHIELD WIPER DURABILITY CERTIFICATION**

Visibility during inclement weather is essential to safe apparatus performance. Windshield wipers shall survive a 3 million cycle durability test in accordance with section 6.2 of SAE J198 Windshield Wiper Systems - Trucks, Buses and Multipurpose Vehicles. The bidder shall certify that the wiper system design has been tested and that the wiper system has met these criteria.

**SEAT BELT ANCHOR STRENGTH**

Seat belt attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat belt anchor design shall withstand 3000 lb of pull on both the lap and shoulder belt in accordance with FMVSS 571.210 Seat Belt Assembly Anchorages. The bidder shall certify that each anchor design was pull tested to the required force and met the appropriate criteria.

**SEAT MOUNTING STRENGTH**

Seat attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat mounting design shall be tested to withstand 20 G's of force in accordance with FMVSS 571.207 Seating Systems. The bidder shall certify that each seat mount and cab structure design was pull tested to the required force and met the appropriate criteria.

**CAB DEFROSTER CERTIFICATION**

Visibility during inclement weather is essential to safe apparatus performance. The defroster system shall clear the required windshield zones in accordance with SAE J381 Windshield Defrosting Systems Test Procedure And Performance Requirements - Trucks, Buses, and Multipurpose Vehicles. The bidder shall certify that the defrost system design has been tested in a cold chamber and passes the SAE J381 criteria.

**CAB HEATER CERTIFICATION**

Good cab heat performance and regulation provides a more effective working environment for personnel, whether in-transit, or at a scene. The cab heaters shall warm the cab 77 degrees Fahrenheit from a cold-soak, within 30 minutes when tested using the coolant supply methods found in SAE J381. The bidder shall certify that a substantially similar cab has been tested and has met these criteria.

**AMP DRAW REPORT**

The bidder shall provide, at the time of bid and delivery, an itemized print out of the expected amp draw of the entire vehicle's electrical system.

The manufacturer of the apparatus shall provide the following:

- Documentation of the electrical system performance tests.
- A written load analysis, which shall include the following:

**II. Minimum Specifications:**

**Bidder Complies**

**Yes      No**

- The nameplate rating of the alternator.
- The alternator rating under the conditions specified per: § Applicable NFPA 1901 or 1906 (Current Edition).
- The minimum continuous load of each component that is specified per: § Applicable NFPA 1901 or 1906 (Current Edition).
- Additional loads that, when added to the minimum continuous load, determine the total connected load.
- Each individual intermittent load.

All of the above listed items shall be provided by the bidder per the applicable NFPA 1901 or 1906 (Current Edition).

**TANK TO PUMP**

The booster tank shall be connected to the intake side of the pump with 4.00" heavy-duty piping and a quarter turn 3.50" Waterous valve. The air control shall be remotely located at the operator's panel. The tank to pump line shall run straight, without elbows, from the pump into the front face of the water tank and angle down into the tank sump. A rubber coupling shall be included in this line to prevent damage from vibration or chassis flexing.

**MARKER LIGHTS**

There shall be one (1) Pair of amber and red LED marker lights with rubber arm, located one (1) each side at the rear of the truck. The amber lens shall face the front and the red lens shall face the rear of the truck.

These lights shall be activated with the running lights of the vehicle.

**WHEEL CHOCK BRACKETS**

There shall be one (1) Pair of Zico, Model SQCH-44-H, horizontal mounting wheel chock brackets provided for the Ziamatic, Model SAC-44-E, folding wheel chocks. The brackets shall be made of aluminum and consist of a quick release spring loaded rod to hold the wheel chocks in place. The brackets shall be mounted on the Driver's side under the Crew Cab.

There shall be one (1) outlet with a 3.00" valve on the left side of the apparatus, terminating with a 3.00" (M) National Standard hose thread adapter.

**TRADE IN ALLOWANCE**

Town of Meredith has a 1988 Pierce Dash 2500 gal. tank, 1250 gpm waterous pump, Detroit Diesel Engine, Automatic Transmission to trade towards the final contract price awarded with said spec. Trade allowance amount will be deducted from contracted price.





## TOWN OF MEREDITH

*Administrative Services*

*41 Main Street, Meredith, New Hampshire 03253*

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*Telephone (603) 279-4538 ♦ Fax (603) 279-1042*

### **PROPOSAL SHEET - B** **2015 Triple Combination Pumper/Tanker**

#### Contractor Information:

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Mailing Address: \_\_\_\_\_

\_\_\_\_\_

E-Mail Address: \_\_\_\_\_

Telephone # \_\_\_\_\_ Cell #: \_\_\_\_\_

Fax Number: \_\_\_\_\_

#### General Instructions:

Please return **PROPOSAL SHEETS A & B**, along with all required certifications and representations, to the Town Manager's Office, Town of Meredith, 41 Main Street, Meredith, NH 03253.

Proposals must be received before noon on 2:00 pm on Monday, November 23<sup>rd</sup>, 2015, at which time the bids will be opened in accordance with all requirements outlined in RFP.

SAMPLE

1. This sample should be reproduced on Company Letterhead.
2. Areas indicated in *Italic*, **Bold** and Underlined should be filled in with the indicated information.
3. The original when complete should be sent with the contract.

**EXHIBIT B**

The Town of Meredith - Indemnification Agreement

The following indemnification agreement shall be and is hereby a provision of this contract:

The Contractor agrees to protect, defend, indemnify, and hold the Town of Meredith harmless from and against any and all losses, penalties, damages, settlements, costs, changes, professional fees or other expenses or liabilities of every kind and character in connection with or arising directly or indirectly out of this agreement and/or the performance thereof.

Without limiting the generality of the foregoing, any and all such claims, etc., relating to personal injury, death, damage to property, defects in materials or workmanship, actual or alleged, or of any other tangible or intangible personal or property right, or any actual or alleged violation of any applicable statute, ordinance, administrative order, rule or regulation, or decree of any court, shall be included in the indemnity hereunder.

The Contractor further agrees to investigate, handle, respond to, provide defense for and defend any such expenses related thereto, even if it (claims, etc.) is groundless, false or fraudulent.

In any case, the foregoing provisions concerning indemnification shall not be constructed to indemnify the town of Meredith for damage arising out of bodily injury to persons or damage to property caused by or resulting from the sole negligence of the Town, its officers, agents or employees.

This covenant shall survive the termination of this agreement.

Agreed upon:

\_\_\_\_\_

Date

\_\_\_\_\_

Company (Contractor) Name

\_\_\_\_\_

Printed/Typed Name of Person Signing

\_\_\_\_\_

Authorized Signature

Address of Company: \_\_\_\_\_

\_\_\_\_\_

Phone # \_\_\_\_\_

Fax: \_\_\_\_\_

Emergency Contact Person: \_\_\_\_\_

Emergency Contact #'s: \_\_\_\_\_

SAMPLE

- 4. This sample should be reproduced on Company Letterhead.
- 5. Areas indicated in Italic, Bold and Underlined should be filled in with the indicated information.
- 6. The original when complete should be sent with the contract.

**EXHIBIT C**  
**CERTIFICATE OF VOTE**

(CORPORATE NAME)

I, (Name of Clerk or Secretary), hereby certify that I am the duly elected (Clerk or Secretary), of (Name of Corporation).

I hereby certify the following is a true copy of a vote taken at a meeting of the Board of Directors of the Corporation, duly called and held on (Date of Meeting), at which a quorum of the Board was present and voting.

DULY VOTED:

***(Inserted herein should be the vote of the corporation authorizing specific officers of the corporation, on behalf of the corporation, to enter into a specific contract, lease or other agreement with the Town of Meredith and further authorizing said officers to execute any documents which may in their judgment be desirable or necessary to effect the purpose of this vote.)***

I hereby certify that said vote has not been amended or repealed, remains in full force and effect as of (Date of Contract), and that (Name(s) of authorized officers(s) is/are the duly elected titles(s)), respectively of this corporation.

Attest: \_\_\_\_\_  
 (Clerk or Secretary)

\_\_\_\_\_ Date

***State of New Hampshire***

County of \_\_\_\_\_

On this the \_\_\_ day of \_\_\_\_\_, 20\_\_\_\_, before me, \_\_\_\_\_ the undersigned officer personally appeared \_\_\_\_\_, who acknowledged himself/herself to the \_\_\_\_\_ of \_\_\_\_\_ corporation, and the he/she, as such \_\_\_\_\_, being authorized so to do executed the foregoing instrument for the purposes therein contained, by signing the name of the corporation by himself/herself as \_\_\_\_\_.

In witness whereof I hereunto set my hand and official seal.

\_\_\_\_\_  
 Justice of the Peace/Notary Public