

**SPECIFICATIONS
FOR
One FIRE ENGINE
PUMPER**

**Camano Island Fire and
Rescue**

811 N Sunrise BLVD

Camano Island, WA 98282

NOTICE

- CALL FOR BIDS -

NEW FIRE ENGINE PUMPER APPARATUS

Sealed bids will be accepted from qualified bidders / vendors by the Island County Fire District # 1 Board of Fire Commissioners for Camano Island Fire & Rescue, (herein after known as CIFR), for one **(1) new fire engine pumper apparatus or a suitable new dealer demonstrator model**. All submitted bids shall include the specified equipment in accordance with the plans and specifications on file with CIFR. It is the intent of the Board to purchase outright, one (1) **newly completed, ready for immediate service**, fire engine pumper apparatus which meets the specifications set forth and published by CIFR.

Sealed Bids will be received at **811 N. Sunrise Blvd, Camano Island, WA 98282 by no later than Friday 4:00 o'clock P.M. on the August 11th, 2023**. All such bids received by this time and at this place will be opened and reviewed at the regular meeting of the CIFR Board of Fire Commissioners at 4:30 PM on Monday, August 14, 2023. A final contract award to the successful bidder will be made at a later date / time after staff review of all received bids. Vendors are encouraged to submit multiple or differing product bid offerings meeting this specification and intent.

The outside of the sealed envelope must be clearly and properly marked and identified by these markings:

"Sealed Bid Fire Apparatus & Equipment."

Any bid **considered and quoted shall reflect the total cash price payment** (via an Island County check warrant) **upon final delivery** and acceptance shall be in accordance with the specifications for this equipment as made by the purchaser. No vendor bid may be withdrawn before a period of thirty (30) days after bid closing date. CIFR reserves the right to reject all bids and/or to accept any bid it deems responsible and in the best interest of the Fire District. CIFR reserves the right to waive all informalities in this bid process.

Special Note: Only vendors / bidders and apparatus manufacturers which conduct business inside the continental United States shall be considered. The definition of a United States bidder and manufacturer is: "The company who resides, pays taxes, manufacturers inside the United States of America. **There will be no exceptions to this requirement.**"

Detailed specifications can be obtained and downloaded at the webpage www.camanofire.com

Any questions or inquiries concerning this bid specification shall be submitted in writing (or email) to:

Assistant Chief Jason Allen

811 N. Sunrise Blvd.

Camano Island, WA 98282

Phone: 360 387 1512

Fax: 360 387 1786

jallen@camanofire.com

Email correspondence is permitted - and is preferred - for quicker responses to any vendor questions/inquiries.

CIFR retains the right to decide all final points of inquiry, the worthiness of the apparatus and equipment being offered within the bid(s), and / or the qualifications of the vendor(s). Such final decisions made by the board of fire commissioners will be considered final.

Bidder Complies	
Yes	No

SPECIFICATIONS FOR ONE PUMPER

Sealed bids will be received by Camano Island Fire & Rescue for the furnishing of all necessary labor, equipment and material for the Fire Apparatus and other equipment as outlined in the following specifications.

INTENT OF SPECIFICATIONS

It shall be the intent of these specifications to cover the furnishing and delivery of a complete fire apparatus. These detailed specifications cover the requirements as to the type of construction, finish, equipment, and tests to which the fire apparatus shall conform. Minor details of construction and materials, which are not otherwise specified, are left to the discretion of the contractor.

Images and illustrative material in this specification are as accurate as known at the time of publication but are subject to change without notice. Images and illustrative material is for reference only, and may include optional equipment and accessories and may not include all standard equipment.

INSTRUCTIONS TO BIDDERS

All bids will be accepted by Sealed Bids will be received at **811 N. Sunrise Blvd, Camano Island, WA 98282 by no later than Friday 4:00 o'clock P.M. on the August 11th, 2023.** Bids may be mailed to **811 N. Sunrise Blvd, Camano Island, WA 98282** or hand delivered to the **811 N. Sunrise Blvd, Camano Island, WA 98282.** The bids will be opened at the regular meeting of the CIFR Board of Fire Commissioners at 4:30 PM on Monday, August 14, 2023. Camano Island Fire and Rescue reserves the right to accept or reject any or all bids.

Any questions regarding this specification must be submitted in writing via email and be received by the Camano Island Fire and Rescue a minimum of three (3) business days prior to the bid opening date. Clarifications, corrections and/or changes shall be sent out via email to all prospective bidders.

The purchaser reserves the right to reject any or all bids or accept any bid presented which meets or exceed these specifications and which the purchaser may deem shall be in the best interest of the Fire District regardless of the amount proposed.

The complete apparatus shall be manufactured within the continental United States. Vehicles manufactured outside of the continental USA may not be considered.

The purchaser's standards for bidding automotive fire apparatus must be strictly adhered to, and all bid forms and questions must be completed and submitted with the bid.

Bidder Complies	
Yes	No

Bids shall only be considered from companies that have an established reputation in the field of fire apparatus construction. Furthermore, to insure fair, ethical, and legal competition, neither the original equipment manufacturer (O.E.M.) nor 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).

If a bidder represents more than one fire apparatus company or brand of apparatus, they must only bid the top of the line that meets specification.

Each bidder shall furnish satisfactory evidence of their ability to construct the apparatus specified.

Each bid shall be accompanied by a set of manufacturer's set of specifications consisting of a detailed description of the apparatus, construction methods, and equipment proposed to which the apparatus furnished under contract shall conform. These specifications shall indicate size, type, model and make of all component's parts and equipment, providing proof of compliance with every item in the department's advertised specifications. A letter only, even though written on a company letterhead, shall not be sufficient. **An exception to this requirement shall not be acceptable.**

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.

The purchaser will utilize this advertised specification to compare all submitted bid proposals. To facilitate comparison, all bid proposal specifications shall be submitted in the same sequence as the advertised specification. Any bidder who fails to submit a set of bid proposal specifications, or who photocopies and submits these specifications as their own construction details will be considered nonresponsive. This shall render such proposal ineligible for award.

The purchaser's specification shall, in all cases, govern the construction of the apparatus, unless a properly documented exception or deviation was approved. Any bid indicating that the manufacturer's proposal shall supersede the purchaser's specification will be considered a complete substitute and immediately rejected.

THE PURCHASER HAS THE RIGHT TO REJECT ANY BIDS WHICH DOES NOT MEET THESE SPECIFICATIONS AND IS THE SOLE DECIDER TO DEEM WHICH BID IS IN THE BEST INTEREST OF THE PURCHASER.

EXCEPTIONS

These specifications are based upon design and performance criteria which have been developed by the fire department because of extensive research and careful analysis. Subsequently these specifications reflect the only type of fire apparatus that is acceptable at this time and all specifications herein contained are considered as minimum. Therefore, exceptions to the specifications may not be accepted.

Bidder Complies	
Yes	No

Bidders shall indicate in the "yes/no" column if their bid complies with each item (paragraph) specified.

If a product brand name is specified and is commercially available to all bidders, an exception to such items is not acceptable and such bid may be rejected.

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. All deviations, no matter how slight, shall be clearly explained on a separate sheet, in the bid sequence, citing the page and paragraph number(s) of the specifications, how the proposal deviation is different, how the deviation meets or exceeds the specifications and why it is necessary, and entitled "EXCEPTIONS TO SPECIFICATIONS". The buyer reserves the right to require a bidder to provide proof in each case that a substituted item is equal to that specified. The buyer shall be the sole judge in determination of acceptable substitutes.

Proposals that are found to have deviations without listing them or bids taking total exceptions to these advertised specifications will be rejected (no exception).

GENERAL DESIGN AND CONSTRUCTION

All bidders shall provide a list of the company, manufacturing location, and engineering source for each individual major component, including but not limited to the welded cab assembly, the pumphouse module assembly, the chassis assembly, body and electrical system.

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.

The bidder shall make accurate statements as to the apparatus' weight and dimensions.

QUALITY AND WORKMANSHIP

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 the 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.

The manufacturer shall also be certified to 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

Bidder Complies	
Yes	No

for design, manufacture, installation, and service. A copy of the certificate of compliance shall be included with the bid.

To demonstrate the quality of the product and service, each bidder shall provide a list of at least two (2) fire departments/municipalities in the region that have bought a second time from the representing dealer. **An exception to this requirement shall not be acceptable.**

DELIVERY

Apparatus, to ensure 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 representative shall deliver the apparatus and remain for a sufficient length of time to instruct personnel in proper operation, care and maintenance of the equipment delivered.

MANUALS AND SERVICE INFORMATION

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

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 axle 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 the governed rpm (full load).

Bidder Complies	
Yes	No

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.

SERVICE AND WARRANTY SUPPORT (DEALERSHIP)

TO ENSURE FULL SERVICE AFTER DELIVERY, THE SELLING BIDDER/DEALERSHIP MUST BE CAPABLE OF PROVIDING SERVICE WHEN REQUIRED.

The bidder/dealership shall show that the company is able to render prompt service and to furnish replacement parts.

Each bidder/dealership must be able to display that they are actively in the fire apparatus service business by operating in conjunction with a factory authorized service center and parts repository capable of satisfying the warranty service requirements and parts requirements of the vehicle(s) being purchased.

The bidder/dealership must state the location of this authorized service center. This service center must have a staff of factory-trained mechanics, well versed in all aspects of service for all major components of the apparatus. The service center must be within one hundred (100) miles of the CIFR.

SERVICE AND WARRANTY SUPPORT (MANUFACTURER)

To provide an additional layer of service support, the successful manufacturer must also own a least two separate service facilities, one located in the northern portion of the US to service both Canada and the northern US states and one in the south to service the southern states.

The manufacturer shall stock parts dedicated to service and replacement parts to ensure quick response and minimize down time. Furthermore, the manufacturer shall house the inventory in a dedicated facility, with a dedicated shipping area that ensures service parts are given priority. The bidder shall provide detailed documentation of service and replacement part resources.

Parts identification shall be provided to both the dealer and the Fire Department through an online web based application for the specific truck reflected in this specification. Access will be granted using the specific VIN number of the vehicle. The online web application will provide the ability to view complete bills of materials, digital photographs, parts drawings, assembly drawings, and access to all current operation, maintenance, and service publications.

Bidder Complies	
Yes	No

The manufacturer must be capable of providing both in-house and on-site service for the apparatus.

The manufacturer shall offer regional factory hands-on repair and maintenance training classes.

LIABILITY

The successful bidder shall defend 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.

INSURANCE PROVIDED BY BIDDER

COMMERCIAL GENERAL 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 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 \$2,000,000

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 the Owner as an additional insured when required by written contract.

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 and coverage shall be written on a Commercial Automobile liability form:

Each Accident Combined Single Limit: \$1,000,000

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:

Bidder Complies	
Yes	No

Aggregate: \$3,000,000

Each Occurrence: \$3,000,000

The umbrella policy shall be written on an occurrence basis and at a minimum provide excess to the bidder's General Liability and Automobile 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. Best.

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 policies be cancelled before the expiration date thereof, notice shall be delivered in accordance with the policy provisions.

The bidder agrees to furnish the owner with a current Certificate of Insurance with the coverages listed above along with the bid. The certificate shall show the purchaser as certificate holder.

INSURANCE PROVIDED BY MANUFACTURER

PRODUCT LIABILITY INSURANCE

The manufacturer 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 Product Liability insurance:

Each Occurrence \$1,000,000

Products/Completed Operations Aggregate \$1,000,000.

Coverage shall be written on a Commercial General Liability form. The policy shall be written on an occurrence form. The manufacturer's policy shall include the owner as additional insured when required by written contract between the Owner and the manufacturers authorized dealer.

UMBRELLA/EXCESS LIABILITY INSURANCE

The manufacturer 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:

Each Occurrence: \$25,000,000

Bidder Complies	
Yes	No

Aggregate: \$25,000,000

The umbrella policy shall be written on an occurrence basis and provide excess to the manufacturer's General Liability/Products 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. Best.

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 policies be cancelled before the expiration date thereof, notice shall be delivered in accordance with the policy provisions.

The manufacturer agrees to furnish the owner with a current Certificate of Insurance with the coverages listed above along with the bid. The certificate shall show the purchaser as the certificate holder.

NFPA 2016 STANDARDS

This unit shall comply with the NFPA standards effective January 1, 2016, except for fire department specifications that differ from NFPA specifications. 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.

All horizontal surfaces designated as a standing or walking surface that are greater than 48.00" above the ground must be defined by a 1.00" wide line along its outside perimeter. Perimeter markings and designated access paths to destination points shall be identified on the customer approval print and are shown as approximate. Actual location(s) shall be determined based on materials used and actual conditions at final build. Access paths may pass through hose storage areas and opening or removal of covers or restraints may be required. Access paths may require the operation of devices and equipment such as the aerial device or ladder rack.

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.

Bidder Complies	
Yes	No

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".

PUMP TEST

The pump shall be tested, approved, and certified by Underwriter's Laboratory 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.

VEHICLE INSPECTION PROGRAM CERTIFICATION

To assure the vehicle is built to current NFPA 1901 standards, the apparatus, in its entirety, shall be third-party, independent, audit-certified through Underwriters Laboratory (UL) that it is built and complies to all applicable standards in the current edition. 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.

BID BOND

All bidders shall provide a bid bond as security for the bid in the form of a 10% bid bond to 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.

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

Bidder Complies	
Yes	No

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.

PERFORMANCE BOND NOT REQUESTED

A performance bond shall not be included. If requested later, one shall be provided to you for an additional cost and the following shall apply:

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.

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 Bumper to Bumper warranty period included within this proposal. The owner agrees that the penal amount of this bond shall be simultaneously amended to 25 percent of the total contract 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 three (3) years from the date of such satisfactory acceptance and delivery, or the actual Bumper to Bumper warranty period, whichever is shorter.

The manufacturer shall list in their bid a delivery time frame which shall be considered as part of evaluation of the bid packets. Once a manufacturer is selected from the submitted bids, the selected manufacturer will provide a build timeline to CIFR in writing with a final completion date. CIFR and the manufacturer will agree to that timeline and any extension beyond the date listed will incur a penalty of \$200 per day for every day the vehicle is not on site at CIFR, and the bid requirements are not met in full. Any incomplete work or training will count toward the penalty days. The total penalty amount will be refunded to CIFR by the manufacturer within sixty (60) calendar days of final delivery.

PRE-DELIVERY CONFERENCE

Bidder Complies	
Yes	No

A pre-delivery conference shall be conducted either at the Fire District Headquarters or where the selected apparatus is located, at which time **all final designs, or any lettering / stripping color options and / or equipment mounting locations** will be approved. A factory-trained dealer shall be present during the pre-delivery conference to answer any design questions relating to the layout of the apparatus. All expenses required for travel, meals, and lodging shall be included and paid for by the successful vendor. **BIDDER SHALL INDICATE INTENTION TO PROVIDE THE Required PRE-DELIVERY CONFERENCE IN THE PROPOSAL PACKET.**

INSPECTION TRIPS

One (1) Inspection trip(s) for Fire District personnel shall be made to the facility or apparatus location during the purchase for this apparatus. Successful bidder shall consult with Fire District committee chairperson as to the proper timing of the inspection trip(s). Air travel (for distances over 250 miles), meals, and lodging expenses shall be included by the vendor of three (3) agency representatives to attend. **BIDDER SHALL INDICATE INTENTION TO PROVIDE THE REQUIRED INSPECTION TRIP(S) IN THE PROPOSAL PACKET.**

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.

REJECTION OF PROPOSALS

The right is reserved to reject any or all proposals or to accept such proposal as is in the best interest of the purchaser. All bid requirements and specifications as written are considered minimum. Bids will be rejected which substitute less substantial materials and / or methods of body construction than those specified. Since all manufacturers have the ability to purchase the materials described as well as to shear, fabricate and assemble body panels as specified, these areas are considered a strict requirement of the specification. Bidders taking "total exception" to these specifications, providing specifications not in this order, or sub-standard offers for in-stock apparatus are hereby advised that any such offer may result in immediate rejection of the bid proposal. **The purchaser does not, in any way, obligate itself to accept the lowest bid.** Proposals may be rejected for any alteration, erasures, or penciled entries. No bidder may withdraw his proposal for at least 30 days after the scheduled closing time for the receipt of bids.

Bidders taking "total exception" to these specifications are hereby advised that any such statement will result in immediate rejection of the bid proposal.

Bidder Complies	
Yes	No

DELIVERY AND OPENING OF PROPOSAL

Each proposal and all papers bound and attached thereto, together with the proposal guarantee, shall be placed in an envelope or a secure box packaging and securely sealed therein. Sealed Proposals will be received prior to the time set for the opening of bids. Proposals received after the Bid Opening will be returned, unopened. The bids will be opened publicly and read aloud at the time and date stated on the advertisement for bids. An award of bid will occur at a later date / time after staff have reviewed all qualified proposals.

PAYMENT

Upon acceptance, the final cash payment for the apparatus shall be made at the time of delivery of the completed vehicle on site at CIFR. Due to insurance liability, the apparatus will not be left at the purchaser's location after final payment has been made without prior agreement between the Purchaser and Bidder. **Final delivery price shall include any and all Local, State or Federal taxes.** The Bidder shall not be liable for any State or Federal mandated tax or program after sale or delivery of the apparatus.

ELECTRICAL WIRING DIAGRAMS

There shall be electrical wiring diagrams, prepared for the model of chassis and body provided in the following configurations:

One (1) hard copy of the electrical diagrams provided.

No CDs of the electrical diagrams provided.

Two (2) USB flash drives with the electrical diagrams provided.

CHASSIS

The 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 and capacity for the intended load to be sustained and the type of service required.

MAXIMUM OVERALL HEIGHT

The maximum overall height of the apparatus shall be 120". This measurement shall be taken with no water in the tank and no equipment on board the apparatus.

Bidder Complies	
Yes	No

ANGLE OF APPROACH

The angle of approach shall be 13 degrees degrees. This shall be effective with the truck in a loaded state.

ANGLE OF DEPARTURE

The angle of departure shall be 12 degrees degrees. This shall be effective with the truck in a loaded state.

WHEELBASE

The wheelbase of the vehicle shall be no greater than 197".

GVW RATING

The gross vehicle weight rating shall be a minimum of 47,000 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.

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 a 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 or equivalent materials.

FRONT AXLE

The front axle shall be a reverse "I" beam type with inclined kingpins. It shall be a Meritor® axle, Model MFS-20, with a rated capacity of 20,000 lb or equivalent.

FRONT SUSPENSION

The front springs shall be a Standens, three (3)-leaf, taper leaf design, 54.00" long x 4.00" wide, with a ground rating of 20,000 lb or equivalent.

Bidder Complies	
Yes	No

The two (2) top leaves shall wrap the forward spring hanger pin. The top leaf shall also wrap the rear spring hanger pin. Both the front and rear eyes shall be Berlin style wraps that shall place the eyes in the horizontal plane within the main leaf. This shall reduce bending stress from acceleration and braking.

A steel encased rubber bushing shall be used in the spring eye. The steel encased rubber bushing shall be maintenance free and require no lubrication.

SHOCK ABSORBERS

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

FRONT OIL SEALS

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

FRONT TIRES

Front tires shall be Goodyear 385/65R22.5 radials, 18 ply Armor Max MSA tread, rated for 20,050 lb maximum axle load and 68 mph maximum speed.

The tires shall be mounted on Alcoa 22.50" x 12.25" polished aluminum disc type wheels with a ten (10) stud, 11.25" bolt circle.

REAR AXLE

The rear axle shall be a Meritor™, Model RS-26-185, with a capacity of 27,000 lb or equivalent.

TOP SPEED OF VEHICLE

A rear axle ratio shall be furnished to allow the vehicle to reach a top speed of 68 mph. During the preconstruction meeting the manufacturer and CIFR will review the gear ratios and transmission gears to ensure maximum performance and hill climbing ability for terrain of CIFR.

REAR SUSPENSION

The rear suspension shall be Standens, semi-elliptical, 3.00" wide x 53.00" long, 12-leaf pack with a ground rating of 27,000 lb. The spring hangers shall be castings.

The two (2) top leaves shall wrap the forward spring hanger pin, and the rear of the spring shall be a slipper style end that shall ride in a rear slipper hanger. To reduce bending stress due to acceleration and braking, the front eye shall be a berlin eye that shall place the front spring pin in the horizontal plane within the main leaf.

Bidder Complies	
Yes	No

A steel encased rubber bushing shall be used in the spring eye. The steel encased rubber bushing shall be maintenance free and require no lubrication.

REAR OIL SEALS

Oil seals shall be provided on the rear axle(s).

REAR TIRES

Rear tires shall be four (4) Goodyear 12R22.50 radials, load range H, Endurance RSA highway tread, rated for 27,120 lb maximum axle load and 75 mph maximum speed.

The tires shall be mounted on Alcoa 22.50" x 8.25" polished aluminum disc wheels with a ten (10) stud 11.25" bolt circle.

TIRE BALANCE

All tires shall be balanced with Counteract balancing beads. The beads shall be inserted into the tire and eliminate the need for wheel weights.

TIRE PRESSURE MANAGEMENT

There shall be a 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 six (6) tires.

The sensor shall calibrate 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 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.

CHROME LUG NUT COVERS

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

FRONT HUB COVERS

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

MUD FLAPS

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

Bidder Complies	
Yes	No

WHEEL CHOCKS

There shall be one (1) pair of folding Ziamatic, Model SAC-44-E, aluminum alloy, Quick-Choc wheel blocks with easy-grip handle provided.

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 below the left side rear compartment.

ANTI-LOCK BRAKE SYSTEM

The vehicle shall be equipped with a Meritor WABCO 4S4M, anti-lock braking system. The ABS shall provide a 4-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 particular wheel begins to lock up, 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.

BRAKES

The service brake system shall be full air type by Meritor™.

Front brakes shall be Model EX225 Disc Plus, disc type with automatic pad wear adjustment and 17.00" ventilated rotors for improved stopping distance.

The rear brakes shall be Meritor™, Disc Plus, Model EX225, disc operated with automatic slack adjusters and a 17.00" ventilated rotor for improved stopping distance.

BRAKE SYSTEM AIR COMPRESSOR

The air compressor shall be a Cummins/WABCO with 18.7 cubic feet per minute output.

BRAKE SYSTEM

The brake system shall include:

- Brake treadle valve
- Heated automatic moisture ejector on air dryer
- Total air system minimum capacity of 4,272 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, with an automatic spring brake application at 40 psi
- A pressure protection valve to prevent all air operated accessories from drawing air from the air system when the system pressure drops below 80 psi (550 kPa)
- 1/4 turn drain valves on each air tank

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.

BRAKE SYSTEM AIR DRYER

The air dryer shall be WABCO System Saver 1200 with spin-on coalescing filter cartridge and 100-watt heater.

BRAKE LINES

Color-coded nylon brake lines shall be provided. The lines shall be wrapped in a heat protective loom where necessary in the chassis.

AIR INLET

One (1) air inlet with 3D series 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 forward in the driver side lower step well of cab. 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 fitting shall also be provided with the loose equipment.

ENGINE

The chassis shall be powered by an electronically controlled engine as described below:

Make:	Cummins
Model:	X10
Power:	450 hp at 2100 rpm
Torque:	1650 lb-ft at 1400 rpm
Governed Speed:	2200 rpm
Emissions Level:	EPA 2027

Bidder Complies	
Yes	No

Fuel:	Diesel
Cylinders:	Six (6)
Displacement:	606 cubic inches (9.9L)
Starter:	Delco 39MT™
Fuel Filters:	Spin-on style primary filter with water separator and water-in-fuel sensor. Secondary spin-on style filter.

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.

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

A Jacobs® 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, medium, and low setting.

The engine brake shall activate when the system is on, and the throttle is released.

The high setting of the brake application shall activate and work simultaneously with the variable geometry turbo (VGT) provided on the engine.

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.

Bidder Complies	
Yes	No

CLUTCH FAN

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

ENGINE AIR INTAKE

The engine air intake shall be located above the engine cooling package. It shall draw fresh air from the front of the apparatus through the radiator grille.

The ember separator is designed to prevent road dirt and recirculating hot air from entering the engine.

The ember separator shall be easily accessible by tilting the cab.

EXHAUST SYSTEM

The exhaust system shall be stainless steel from the turbo to the engine's aftertreatment device and shall be 4.00" in diameter. The exhaust system shall include a single module after-treatment device to meet current EPA standards. An insulation wrap shall be provided on all exhaust pipes between the turbo and aftertreatment device to minimize the heat loss to the aftertreatment device. The exhaust shall terminate horizontally ahead of the right-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.

The tail pipe shall exit the vehicle at a location to allow a magnet for Nederman exhaust capture device to be placed on the side of the vehicle body. Location to be verified at the preconstruction meeting.

RADIATOR

The radiator and the complete cooling system shall meet or exceed NFPA and engine manufacturer cooling system standards.

For maximum corrosion resistance and cooling performance, the entire radiator core shall be constructed using long life aluminum alloy. The radiator core shall consist of aluminum fins, having a serpentine design, brazed to aluminum tubes. No solder joints or lead material of any kind shall be acceptable in the core assembly.

The radiator core shall have a minimum front area of 1060 square inches.

The supply tank shall be made of heavy-duty glass-reinforced nylon and the return tank shall be made of aluminum. Both tanks shall be crimped onto the core assembly using header tabs and

Bidder Complies	
Yes	No

a compression gasket to complete the radiator core assembly. There shall be a full steel frame around the inserts to enhance cooling system durability and reliability.

The radiator shall be compatible with commercial antifreeze solutions.

The radiator assembly shall be isolated from the chassis frame rails with rubber isolators to prevent the development of leaks caused by twisting or straining when the apparatus operates over uneven terrain.

The radiator shall include a de-aeration/expansion 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.

Shields or baffles shall be provided to prevent recirculation of hot air to the inlet side of the radiator.

COOLANT LINES

Gates Blue Stripe rubber hose shall be used for all engine coolant lines 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 12-gauge, hot rolled steel. It shall be equipped with swash partitions and a vent. To eliminate the effects of corrosion, the fuel tank shall be mounted with stainless steel straps.

A 0.75" 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 0.50" 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.

Bidder Complies	
Yes	No

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 located on the driver's side of the body and be covered with a hinged, spring loaded, polished stainless-steel door that is marked "Diesel Exhaust Fluid Only".

The tank shall meet the engine manufacturer's requirement for 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 PRIMING PUMP

A Cummins automatic electronic fuel priming pump shall be integrated as part of the engine.

TRANSMISSION

An Allison 6th generation, Model EVS 4000P, electronic, torque converter, 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 the left side and top of converter housing (positions 8 o'clock and 1 o'clock).

A transmission temperature gauge with an amber 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 the 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 Modine plate and fin transmission oil cooler shall be provided using engine coolant to control the transmission oil temperature.

DRIVELINE

Drivelines shall be a heavy-duty metal tube and be equipped with Spicer® 1810 universal joints.

The shafts shall be dynamically balanced before installation.

A splined slip joint shall be provided in each driveshaft where the driveline design requires it. The slip joint shall be coated with Glidecoat® or equivalent.

STEERING

Dual steering gear, with integral heavy-duty power steering, shall be provided. For reduced system temperatures, the power steering shall incorporate an air to oil cooler and Vickers® V20NF 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.

Bidder Complies	
Yes	No

The first row of text shall be: Built

The second row of text shall be: For

The third row of text shall be: CIFR

BUMPER

A one (1)-piece bumper manufactured from .25" formed steel with a .38" bend radius shall be provided. The bumper shall be a minimum of 10.00" high with a 1.50" top and bottom flange. The bumper shall be 95.28" wide with 45-degree corners. The bumper shall be metal finished and painted job color.

The bumper shall extend 22.00" from the face of the cab.

The bumper extension frame shall be fabricated using .38" gussets welded to 2.00" x 5.00" steel tubing running front to back with .50" front and rear plates mounted to the chassis frame. The fabricated "U" shaped channel supports the weight of the bumper and provides the main strength in frontal crash. .25" steel is formed into "C" shaped backing plates for mounting the bumper and providing protection to the cab.

The bumper extension's cross section is considered expendable, and a crush zone. The bumper is not intended for pushing other vehicles or objects.

Tow eyes located under the bumper extension are for straight pull only.

LIFT AND TOW MOUNTS

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.

TOW EYES

Two (2) .75" thick stainless steel tow eyes shall be installed under the bumper and attached to the front frame members. The tow eyes shall be designed and positioned to allow up to a 9,000 lb straight horizontal pull in line with the centerline of the vehicle. The tow eyes shall not be used for lifting of the apparatus.

The tow eyes shall not be painted.

Bidder Complies	
Yes	No

BUMPER TRAY

A full width bumper tray, constructed of smooth aluminum, shall be located in the under slung bumper extension.

The tray shall be a bolted modular design 14.00" front to back x 8.00" D. The tray shall have capacity for The tray will have capacity for 150' of 1.75" hose. .

Black rubber grating shall be provided at the bottom of the tray. Drain holes are also provided.

GRAVEL PAN

A gravel pan, constructed of bright aluminum treadplate, shall be furnished between the bumper and cab face.

The gravel pan shall be properly supported from the underside to prevent flexing and vibration of the aluminum treadplate.

3/4 WIDTH COVER

A bright aluminum treadplate cover shall be provided over the entire top of the bumper tray.

The cover shall be raised approximately 6.00" above the gravel pan. The cover shall provide adequate room for a front bumper mounted mechanical siren.

The cover shall be attached with a stainless-steel hinge.

Two (2) butterfly latches shall secure the cover in the closed position and two (2) gas springs shall hold the cover in the open position.

BUMPER COVER NOTCH

There shall be one (1) hose tray notch(es) provided for the bumper tray cover(s) located Notch TBD at Preconstruction. Each notch shall allow hose to be pre-connected to front outlets.

CAB

The cab shall be designed specifically for the fire service and manufactured by the chassis builder.

For reasons of structural integrity and enhanced occupant protection, the cab shall be a heavy-duty design, constructed to the following minimal standards.

Bidder Complies	
Yes	No

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 castings. The B-pillar and C-pillar shall be constructed from 0.13" wall extrusions. The rear wall shall be constructed of two (2) 2.00" x 2.00" outer aluminum extrusions and two (2) 2.00" x 1.00" inner aluminum extrusions. All main vertical structural members shall run from the floor to 4.625" x 3.864" x 0.090" thick roof extrusions to provide a cage-like structure with the A-pillar and roof extrusions being welded into a 0.25" thick corner casting at each of the front corners of the roof assembly.

The front of the cab shall be constructed of a 0.13" firewall plate, covered with a 0.090" front skin (for a total thickness of 0.22"), and reinforced with a full width x 0.50" thick cross-cab support located just below the windshield and fully welded to the engine tunnel. The cross-cab support shall run the full width of the cab and weld to each A-pillar, the 0.13" firewall plate, and the front skin.

The cab floors shall be constructed of 0.125" thick aluminum plate and reinforced at the firewall with an additional 0.25" thick cross-floor support providing a total thickness of 0.375" of structural material at the front floor area. The front floor area shall also be supported with two (2) triangular 0.30" wall extrusions that also provide the mounting point for the cab lift. This tubing shall run from the floor wireway of the cab to the engine tunnel side plates, creating the structure to support the forces created when lifting the cab.

The cab shall be 96.00" wide (outside door skin to outside door skin) to maintain maximum maneuverability.

The forward cab section shall have an overall height (from the cab roof to the ground) of approximately 99.00". The crew cab section shall have a 10.00" raised roof, with an overall cab height of approximately 109.00". The overall height listed shall be calculated based on a truck configuration with the lowest suspension weight rating, 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 64.50" in the center and outboard positions.

The crew cab floor shall measure 46.00" from the rear wall to the back side of the rear facing seat risers.

The medium block engine tunnel, at the rearward highest point (knee level), shall measure 61.50" to the rear wall. The big block engine tunnel shall measure 51.50" to the rear wall.

The crew cab shall be a totally enclosed design with the interior area completely open to improve visibility and verbal communication between the occupants.

The cab shall be a full tilt cab style.

Bidder Complies	
Yes	No

A 3-point cab mount system with rubber isolators shall improve ride quality by isolating chassis vibrations from the cab.

CAB ROOF DRIP RAIL

For enhanced protection from inclement weather, a drip rail shall be furnished on the sides of the cab. The drip rail shall be painted to match the cab roof, and bonded to the sides of the cab. The drip rail shall extend the full length of the cab roof.

INTERIOR CAB INSULATION

The cab shall include 1.00" insulation in the ceiling, 1.50" insulation in the 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.

PANORAMIC WINDSHIELD

A safety glass windshield shall be provided with over 2,775 square inches of clear viewing area. The windshield shall be full width and shall provide the occupants with a panoramic view. The windshield shall consist of three (3) layers: outer light, middle safety laminate, and inner light. The outer light layer shall provide superior chip resistance. The middle safety laminate layer shall prevent the windshield glass pieces from detaching in the event of breakage. The inner light shall provide yet another chip resistant layer. The cab windshield shall be bonded to the aluminum windshield frame using a urethane adhesive. A custom frit pattern shall be applied on the outside perimeter of the windshield for a finished automotive appearance.

WINDSHIELD WIPERS

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.

ENGINE TUNNEL

Engine hood side walls shall be constructed of 0.375" aluminum. The top shall be constructed of 0.125" 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.

Bidder Complies	
Yes	No

The engine tunnel shall be no higher than 17.00" off the crew cab floor.

CAB REAR WALL EXTERIOR COVERING

The exterior surface of the rear wall of the cab shall be overlaid with bright aluminum treadplate except for areas that are not typically visible when the cab is lowered.

CAB LIFT

A hydraulic cab lift system shall be provided consisting of an electric powered hydraulic pump, dual lift cylinders, and necessary hoses and valves.

Lift controls shall be located on the right-side pump panel or front area of the body in a convenient location.

The cab shall be capable of tilting 43 degrees to accommodate engine maintenance and removal.

The cab shall be locked down by a 2-point normally closed spring-loaded hook type latch that fully engages after the cab has been lowered. The system shall be hydraulically actuated to release the normally closed locks when the cab lift control is in the raised position and cab lift system is under pressure. When the cab is completely lowered and system pressure has been relieved, the spring-loaded latch mechanisms shall return to the normally closed and locked position.

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 left 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.

Cab Lift Interlock

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.

GRILLE

A bright finished aluminum mesh grille screen, inserted behind a bright finished grille surround, shall be provided on the front center of the cab.

Bidder Complies	
Yes	No

DOOR JAMB SCUFFPLATES

All cab door jambs shall be furnished with a 1.00" polished stainless steel scuff plate, mounted on the striker side of the jamb.

SIDE OF CAB MOLDING

Chrome molding shall be provided on both sides of the cab.

MIRRORS

A Retrac, Model 613423, 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 75.50" 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 door openings shall be a minimum of 34.30" wide x 85.50" high.

The forward cab and crew cab doors shall be constructed of extruded aluminum with a nominal material thickness no less than 0.093". The exterior door skins shall be constructed from no less than 0.090" aluminum.

A door handle shall be provided on the exterior of each cab door. The finish of the door handle shall be chrome/black. The exterior handle shall be designed specifically for the fire service to prevent accidental activation and shall provide 4.00" wide x 2.00" deep hand clearance for ease of use with heavy gloved hands.

Each door shall also be provided with an interior flush, open style paddle handle that shall be readily operable from fore and aft positions and be designed to prevent accidental activation. The interior handles shall provide 4.00" wide x 1.25" deep hand clearance for ease of use with heavy gloved hands.

The cab doors shall be provided with both interior (rotary knob) and exterior (keyed) locks exceeding FMVSS standards. The keys shall be Model 751. 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 weather-tight fit.

Bidder
Complies
Yes No

A chrome grab handle shall be provided on the inside of each cab door for ease of entry.

A red webbed grab handle shall be installed on the crew cab door stop strap. The grab handles shall be securely mounted.

The cab steps at each cab door location shall be located inside the cab doors to protect the steps from weather elements.

Door Panels

The inner cab door panels shall be constructed out of brushed stainless steel.

MANUAL CAB DOOR WINDOWS

All cab entry doors shall contain a conventional roll down window.

CAB STEPS

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 25.00" wide, and the crew cab steps shall be 21.65" wide with a 10.00" minimum depth. The inside cab steps shall not exceed 16.50" in height.

The vertical surfaces of the step well shall be aluminum treadplate.

CAB EXTERIOR HANDRAILS

A 1.25" diameter slip-resistant, knurled aluminum handrail shall be provided adjacent to each cab and crew cab door opening to assist during cab ingress and egress.

STEP LIGHTS

There shall be six (6) white LED step lights with chrome housing installed for cabs and crew cab access steps.

- One (1) light for the left access steps.
- Two (2) lights for the left side crew cab access steps.
- Two (2) lights for the right-side crew cab access steps.
- One (1) light for the right-side access step.

To ensure exceptional illumination, each light shall provide a minimum of 25 foot-candles (fc) covering an entire 15" x 15" square placed ten (10) inches below the light and a minimum of 1.5 fc covering an entire 30" x 30" square at the same ten (10) inch distance below the light.

The lights shall be activated when the battery switch is on and the adjacent door is opened.

FENDER CROWNS

Stainless steel fender crowns shall be installed at the cab wheel openings.

STORAGE COMPARTMENTS

Provided on each side of the cab, to the rear of the crew cab access doors, shall be a storage compartment. The compartments shall be 13.75" wide x 84.00" high x 15.00" deep below the cab floor and 12.00" deep for the rest of the height above the floor. The cab floor shall be removed so the compartments are open from top to bottom.

The doors shall be painted aluminum, double pan construction with one (1) D-ring slam latch. A pneumatic stay arm for each exterior door shall be used as a door stop. The clear door opening shall be 12.25" wide x 80.50" high.

The compartment interior shall be painted spatter gray.

Compartment Light

There shall be two (2) white LED strip lights, one (1) on each hinged side of exterior compartment door opening. The lights shall be controlled by an automatic door switch.

CAB DASH

The driver side dash, switch panel located to the right of the driver, and center console shall be an easily removable high impact resistant polymer cover.

The instrument gauge cluster shall be surrounded with a high impact ABS plastic contoured to the same shape of the instrument gauge cluster.

The officer side dash shall be a flat top design with an upper beveled edge to provide easy maintenance and shall be constructed out of aluminum and painted to match the cab interior.

MOUNTING PLATE ON ENGINE TUNNEL

Equipment installation provisions shall be installed on the engine tunnel.

Bidder Complies	
Yes	No

A .25" smooth aluminum plate shall be bolted to the top surface of the engine tunnel. The plate shall follow the contour of the engine tunnel and shall run the entire length of the engine tunnel. The plate shall be spaced off the engine tunnel .50" to allow for wire routing below the plate.

The mounting surface shall be painted to match the cab interior.

CAB INTERIOR

The cab interior shall be constructed of primarily metal (painted aluminum) to withstand the severe duty cycles of the fire service.

The engine tunnel shall be painted aluminum to match the cab interior.

For durability and ease of maintenance, the cab interior side walls shall be painted aluminum. The rear wall shall be painted aluminum.

Headliners shall be installed in both the forward and rear cab sections. The 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.

The forward portion of cab headliner shall permit easy access for service of electrical wiring or other maintenance needs.

All wiring shall be placed in metal raceways. Routing through holes in tubing shall not be accepted due to chaffing that installation shall cause.

CAB INTERIOR UPHOLSTERY

The cab interior upholstery shall be 36 oz dark silver gray vinyl.

CAB INTERIOR PAINT

The cab interior metal surfaces, excluding the rear heater panels, shall be painted fire smoke gray, vinyl texture paint.

The rear heater panels shall be painted black, vinyl textured paint.

CAB FLOOR

The cab and crew cab floor areas shall be covered with acoustical 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 (no water absorption) which offers a sound dampening material for reducing sound levels.

DEFROST/AIR CONDITIONING SYSTEM

A ceiling mounted combination heater, defroster and air conditioning system shall be installed in the cab above the engine tunnel area.

Cab Defroster

A 54,000 BTU heater-defroster unit with 690 SCFM of air flow shall be provided inside the cab. The heater-defrost shall be installed in the forward portion of the cab ceiling. Air outlets shall be strategically located in the cab header extrusion per the following:

- One (1) adjustable shall be directed towards the left side cab window.
- One (1) adjustable shall be directed towards the right-side cab window.
- Six (6) fixed outlets shall be directed at the windshield.

The defroster shall be capable of clearing 98 percent of the windshield and side glass when tested under conditions where the cab has been cold soaked at 0 degrees Fahrenheit for 10 hours, and a 2 ounce per square inch layer of frost/ice has been able to build up on the exterior windshield. The defroster system shall meet or exceed SAE J382 requirements.

Cab/Crew Auxiliary Heater

There shall be one (1) 31,000 BTU auxiliary heater with 560 SCFM of air flow provided in each outboard rear facing seat risers with a dual scroll blower. An aluminum plenum incorporated into the cab structure is used to transfer heat to the forward positions.

Air Conditioning

A condenser shall be a 59,644 BTU output that meets and exceeds the performance specification shall be mounted on the radiator. Mounting the condenser below the cab or body would reduce the performance of the system and shall not be acceptable.

The air conditioning system shall be capable of cooling the average cab temperature from 100 degrees Fahrenheit to 75 degrees Fahrenheit at 50 percent relative humidity within 30 minutes. The cooling performance test shall be run only after the cab has been heat soaked at 100 degrees Fahrenheit for a minimum of 4 hours.

The evaporator unit shall be installed in the rear portion of the cab ceiling over the engine tunnel. The evaporator shall include one (1) high performance heating core, one (1) high performance cooling core with (1) plenum directed to the front and one (1) plenum directed to the rear of the cab. The rear plenum shall be covered with a formed plastic cover.

The evaporator unit shall have a 52,000 BTU at 690 SCFM rating that meets and exceeds the performance specifications.

Adjustable air outlets shall be strategically located on the forward plenum cover per the following:

- Four (4) shall be directed towards the seating position on the left side of the cab
- Four (4) shall be directed towards the seating position on the right side of the cab

Adjustable air outlets shall be strategically located on the rear plenum cover per the following:

- Minimum of five (5) shall be directed towards crew cab area

A high efficiency particulate air (HEPA) filter shall be included for the system. Access to the filter cover shall be secured with four (4) screws.

The air conditioner refrigerant shall be R-134A and shall be installed by a certified technician.

Climate Control

An automotive style controller shall be provided to control the heat and air conditioning system within the cab. The controller shall have three (3) functional knobs for fan speed, temperature, and air flow distribution (front to rear) control.

The system shall control the temperature of the cab and crew cab automatically by pushing the center of the fan speed control knob. Rotate the center temperature control knob to set the cab and crew cab temperature.

The AC system shall be manually activated by pushing the center of the temperature control knob. Pushing the center of the air flow distribution knob shall engage the AC for max defrost, setting the fan speeds to 100 percent and directing all air flow to the overhead forward position.

The system controller shall be located so that a 5'2" driver of the apparatus can easily reach the controls without moving from their seated position.

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. No pumps shall be provided.

SUN VISORS

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

Bidder Complies	
Yes	No

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

GRAB HANDLES

A black rubber covered grab handle shall be mounted on the door post of the driver and officer's side cab door to assist in entering the cab. The grab handles shall be securely mounted to the post area between the door and windshield.

ENGINE COMPARTMENT LIGHTS

There shall be one (1) Whelen, Model 3SC0CDCR, 12-volt DC, 3.00" white LED light(s) with Whelen, Model 3FLANGEC, 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 lift and turn 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's 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.
- Seat belts shall be provided by 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.

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

Bidder Complies	
Yes	No

SEATING CAPACITY

The seating capacity of the vehicle shall be four (4).

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 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.

OFFICER SEAT

A seat shall be provided in the cab for the passenger. The seat design shall be a cam action type, with air suspension. For optimal comfort, the seat shall be provided with 17.00" deep foam cushions designed with EVC (elastomeric vibration control).

The seat back shall be an SCBA back style with 5 degrees 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.

Bidder Complies	
Yes	No

RADIO COMPARTMENT

A radio compartment shall be provided under the officer's seat.

The inside compartment dimensions shall be 16.00" wide x 7.50" high x 15.00" deep, with the back of the compartment angled up to match the cab structure.

A drop-down door with one (1) lift and turn latch shall be provided for access.

The compartment shall be constructed of smooth aluminum and painted to match the cab interior. The compartment shall be ventilated to allow for adequate air movement the radios installed inside the compartment.

RADIO COAX & MOUNTS

There shall be three (3) mobile antenna mounts installed on the roof in a way described during the preconstruction meeting. All mounting shall be waterproof to prevent leaking into the cab.

The coax from the three (3) mobile antenna mounts will be run from the roof to the Radio Compartment to be used by the radio installers after the purchaser has received the apparatus.

Coaxial radio cables should be RG8X cables with NMO termination for use with 700-800 mhz radio use.

Cellular WIFI Antenna

A black Panorama multifunction antenna and cabling that is Mimo and 5G cellular compatible with Cradlepoint devices will be installed on the roof at a location determined during the pre-construction meeting. The device cables will be run to a location also determined during the pre-construction meeting.

INTERCOM SYSTEM

There shall be a digital radio interface intercom located in the officer position in the cab. The control interface shall be mounted within arms reach of the officer's seat. The system will include a headset at each of the four passenger seats.

The following Firecom components shall be provided and installed:

- One (1) 5100D Intercom
- One (1) WB505R wireless base station
- Four (4) FHW505 Headsets

Bidder Complies	
Yes	No

- All necessary power and radio cabling for interface with a Motorola APX 8500 radio

RADIO / INTERCOM INTERFACE CABLE

The apparatus manufacturer shall supply and install the radio interface cable for the Firecom system. The exact make and model of the customer radio will be provided at the preconstruction meeting.

HEADSET HANGERS

There shall be five (5) headset hangers installed in the cab for the intercom headsets, one at each seating position, from the cab ceiling. The hangers shall meet NFPA 1901 requirement for equipment mounting. requirement for equipment mounting.

REAR FACING LEFT SIDE CABINET

A rear facing cabinet shall be provided in the crew cab at the left side outboard position.

The cabinet shall be 23.00" wide x 34.00" high x 26.75" deep with one (1) lap door hinged on the inboard side, painted to match the cab interior with a non-locking D-ring latch. The interior clear door opening of the cabinet shall be 16.00" wide x 31.50" high.

The cabinet shall also provide access from outside the cab with one (1) double pan door painted to match the cab exterior with a non-locking D-ring latch. A rubber bumper shall be provided as a door stop. The door shall be located on the side of the cab over the wheel well. The clear door opening shall be 17.00" wide x 29.25" high.

The cabinet shall include no adjustable shelves or trays in the cabinet interior.

The cabinet shall include no louvers.

The exterior access shall be provided with a polished stainless steel scuff plate on the lower door frame.

The cabinet shall be constructed of smooth aluminum and painted to match the cab interior.

Cabinet Light

There shall be one (1) white LED strip light installed on the left side of the interior cabinet door opening. The lighting shall be controlled by an automatic door switch.

REAR FACING RIGHT SIDE CABINET

A rear facing cabinet shall be provided in the crew cab at the right-side outboard position.

Bidder Complies	
Yes	No

The cabinet shall be 22.00" wide x 34.00" high x 26.75" deep with one (1) lap door hinged on the inboard side, painted to match the cab interior with a non-locking D-ring latch. The clear door opening of the cabinet shall be 15.00" wide x 31.50" high.

The cabinet shall include no adjustable shelves or trays in the cabinet interior.

The cabinet shall include no louvers.

The cabinet shall also provide access from outside the cab with one (1) double pan door painted to match the cab exterior with a non-locking D-ring latch. A rubber bumper shall be provided as a door stop. The exterior clear door opening shall be 17.00" wide x 29.25" high.

The exterior access shall be provided with a polished stainless steel scuff plate on the lower door frame.

The cabinet shall be constructed of smooth aluminum and painted to match the cab interior.

Cabinet Light

There shall be one (1) white LED strip light installed on the right side of the interior cabinet door opening. The lighting shall be controlled by an automatic door switch.

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).

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

- A seat safety system shall be included. When activated, this system shall pretension the seat belt.

The seats shall be furnished with a 3-point, shoulder type seat belt.

SEAT UPHOLSTERY

All seat upholstery shall be black Turnout Tuff 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 cab and tiller cab (if applicable) seating positions shall have red seat belts. To provide quick, easy use for occupants wearing bunker gear, the female buckle and seat belt webbing length shall meet or exceed the current edition of NFPA 1901 and CAN/ULC - S515 standards.

The 3-point shoulder type seat belts shall include height adjustment. This adjustment shall optimize the belts effectiveness and comfort for the seated firefighter. The 3-point shoulder type seat belts shall be furnished with dual automatic retractors that shall provide ease of operation in the normal seating position.

The 3-point shoulder type belts shall also include the ReadyReach D-loop assembly to the shoulder belt system. The ReadyReach feature adds an extender arm to the D-loop location placing the D-loop in a closer, easier to reach location.

Any flip up seats shall include a 3-point shoulder type belts only.

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.

HELMET STORAGE PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, section 14.1.7.4.1 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 black 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.

ENHANCED SOFTWARE FOR CAB AND CREW CAB DOME LIGHTS

The cab and crew cab dome lights shall remain on for 10 seconds for improved visibility after the doors are closed.

The dome lights shall dim after 10 seconds or immediately if the vehicle's transmission is put into gear.

PORTABLE HAND LIGHTS, PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, section 5.9.4 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.

CAB INSTRUMENTATION

The cab instrument panel include gauges, an LCD display, telltale indicator lamps, control switches, alarms, and a diagnostic panel. The function of the 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, forward of the driver. The gauge assembly and switch panels are designed to be removable for ease of service and low cost of ownership.

Gauges

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

- Voltmeter gauge (volts):
 - Low volts (11.8 VDC)
 - Amber caution indicator on the information center with intermittent alarm
 - Amber caution light on gauge assembly

- High volts (15.5 VDC)
 - Amber caution indicator on the information center with intermittent alarm
 - Amber caution light on gauge assembly
- Very low volts (11.3 VDC)
 - Red warning indicator on the information center with a steady alarm
 - Amber caution light on gauge assembly
- Very high volts (16.0 VDC)
 - Red warning indicator on the information center with a steady alarm
 - Amber caution light on gauge assembly
- Engine Tachometer (RPM)
- Speedometer MPH (Major Scale), KM/H (Minor Scale)
- Fuel level gauge (Empty - Full in fractions):
 - Low fuel (1/8 full)
 - Amber caution indicator on the information center with intermittent alarm
 - Amber caution light on gauge assembly
 - Very low fuel (1/32 full)
 - Red caution indicator on the information center with steady alarm
 - Amber caution light on gauge assembly
- Engine Oil pressure Gauge (PSI):
 - Low oil pressure to activate engine warning lights and alarms
 - Red caution indicator on the information center with steady alarm
 - Amber caution light on gauge assembly
- Front Air Pressure Gauges (PSI):
 - Low air pressure to activate warning lights and alarm
 - Red warning indicator on the information center with a steady alarm
 - Amber caution light on gauge assembly
- Rear Air Pressure Gauges (PSI):
 - Low air pressure to activate warning lights and alarm
 - Red warning indicator on the information center with a steady alarm
 - Amber caution light on gauge assembly
- Transmission Oil Temperature Gauge (Fahrenheit):
 - High transmission oil temperature activates warning lights and alarm
 - Amber caution indicator on the information center with intermittent alarm
 - Amber caution light on gauge assembly
- Engine Coolant Temperature Gauge (Fahrenheit):
 - High engine temperature activates an engine warning light and alarms
 - Amber caution indicator on the information center with intermittent alarm
 - Amber caution light on gauge assembly
- Diesel Exhaust Fluid Level Gauge (Empty - Full in fractions):
 - Low fluid (1/8 full)
 - Amber indicator light in gauge dial

All gauges shall perform prove out at initial power-up to ensure proper performance.

Indicator Lamps

To promote safety, the following telltale indicator lamps shall be located on the instrument panel in clear view of the driver. 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)
- Side roll fault (where applicable)
- Front air bag fault (where applicable)

The following red telltale lamps shall be present:

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

Bidder Complies	
Yes	No

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 audible alarm shall be able to be silenced 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

A system shall be provided which automatically tests telltale indicator lights and alarms located on the cab instrument panel. 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. All switches shall have backlit labels for low light applications.

Headlight/Parking light switch: A three (3)-position maintained rocker switch shall be provided. The first switch position shall deactivate all parking and headlights. The second switch position shall activate the parking lights. The third switch shall activate the headlights.

Panel back lighting intensity control switch: A three (3)-position momentary rocker switch shall be provided. Pressing the top half of the switch, "Panel Up" increases the panel back lighting intensity and pressing the bottom half of the switch, "Panel Down" decreases the panel back lighting intensity. Pressing the half or bottom half of the switch several times shall allow back lighting intensity to be gradually varied from minimum to maximum intensity level for ease of use.

Ignition switch: A three (3)-position maintained/momentary rocker switch shall be provided. The first switch position shall turn off and deactivate vehicle ignition. The second switch position shall activate vehicle ignition and shall perform prove-out on the telltale indicators and alarms for 3 to 5 seconds after the switch is turned on. A green indicator lamp is activated with vehicle ignition. The third momentary position shall temporarily silence all active cab alarms. An alarm "chirp" may continue as long as alarm condition exists. Switching ignition to off position shall terminate the alarm silence feature and reset function of cab alarm system.

Bidder
Complies
Yes No

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.

Hazard switch shall be provided on the instrument panel or on the steering column.

Heater, defroster, and air conditioning control panel.

Turn signal arm: A self-canceling turn signal with high beam headlight controls shall be provided.

Windshield wiper control shall include 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.

High idle engagement switch: A momentary rocker switch with integral indicator lamp shall be provided. The switch shall activate and deactivate the high idle function. 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.

"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.

Emergency switching shall be controlled by multiple individual warning light switches for various groups or areas of emergency warning lights. An Emergency Master switch provided on the instrument panel that enables or disables all individual warning light switches is included.

An additional "Emergency Master" button shall be provided on the lower left hand corner of the gauge panel to allow convenient control of the "Emergency Master" system from inside the driver's door when standing on the ground.

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 four (4) switch panels in the lower instrument console and up to six (6) switch panels in the overhead visor console. All switches have backlit labels for low light conditions.

Bidder Complies	
Yes	No

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 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
- Roll sensor diagnostic port
- USB diagnostic port
- 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 the following, along with other configuration specific information:

- Odometer
- Trip mileage
- PTO hours
- Fuel consumption
- Engine hours

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.

"DO NOT MOVE APPARATUS" INDICATOR

A flashing red indicator light, located in the driving compartment, shall be illuminated automatically per the current NFPA requirements. The light shall be labeled "Do Not Move Apparatus If Light Is On."

The same circuit that activates the Do Not Move Apparatus indicator shall activate a pulsing alarm when the parking brake is released.

DO NOT MOVE TRUCK MESSAGES

Messages shall be displayed on a 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):

- Do Not Move Truck
- DS Cab Door Open (Driver Side Cab Door Open)
- PS Cab Door Open (Passenger's Side Cab Door Open)
- DS Crew Cab Door Open (Driver Side Crew Cab Door Open)
- PS Crew Cab Door Open (Passenger's Side Crew Cab Door Open)
- DS Body Door Open (Driver Side Body Door Open)
- PS Body Door Open (Passenger's Side Body Door Open)
- Rear Body Door Open
- DS Ladder Rack Down (Driver Side Ladder Rack Down)
- PS Ladder Rack Down (Passenger Side Ladder Rack Down)
- Deck Gun Not Stowed
- Lt Tower Not Stowed (Light Tower Not Stowed)
- Fold Tank Not Stowed (Fold-A-Tank Not Stowed)
- Aerial Not Stowed (Aerial Device Not Stowed)
- Stabilizer Not Stowed
- Steps Not Stowed
- Handrail Not Stowed

Any other device that is opened, extended, or deployed that creates a hazard or is likely to cause major damage to the apparatus if the apparatus is moved shall be displayed as a caution message after the parking brake is disengaged.

SWITCH PANELS

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)

Bidder Complies	
Yes	No

switch assignments shall include non-functioning black appliques. The built-in switch panels shall be located in the lower console or overhead console of the cab.

Additional switch panel(s) will be located in the overhead position(s) above the windshield or in designated locations on the lower instrument panel layout.

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. An active illuminated switch shall flash when interlock requirements are not met or device is actively being load managed. For ease of use, a two (2)-ply, scratch resistant laser engraved Gravoply label indicating the use of each switch 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

Wiper control shall consist of a two (2)-speed windshield wiper control with intermittent feature and windshield washer controls. The control shall be located on the left side of the center instrument panel.

SPARE CIRCUIT

There shall be one (1) 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 20 amps at 12 volts DC.
- Power and ground shall terminate TBD at Prebuild.
- Termination shall be to a Blue Sea System, Model 5025, 6 circuit with negative bus bar. The terminal block shall include a cover with circuit labels.

Wires shall be sized to 125% of the protection.

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

SPARE CIRCUIT

There shall be one (1) 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 50 amps at 12 volts DC.
- Power and ground shall terminate TBD at Prebuild..
- Termination shall be to a Blue Sea System, Model 5025, 6 circuit with negative bus bar. The terminal block shall include a cover with circuit labels.

Wires shall be sized to 125% of the protection.

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

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
- Termination shall be with heat shrinkable butt splicing
- Wires shall be sized to 125 percent of the protection

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

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 2.0 amps at 12 volts DC.
- Power and ground shall terminate RS dashboard, LS dashboard..
- Termination shall be a Blue Sea Systems part number 1016 dual USB charger socket.
- Wires shall be sized to 125 percent of the protection.

This circuit(s) may be load managed when the parking brake is applied.

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 20 amps at 12 volts DC.
- Power and ground shall terminate LS3, RS3.
- Termination shall be to a Blue Sea System, Model 5025, 6 circuit with negative bus bar. The terminal block shall include a cover with circuit labels.

Wires shall be sized to 125% of the protection.

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

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
- 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 the water level system includes compatible communications to the information center)
- Foam Level
- 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
- Coolant Temperature
- RPM
- Water Level
- Foam Level
- Foam Concentration
- Water Flow Rate
- Water Used
- 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
 - Faults
 - Listed by order of occurrence
 - Allows to sort by system
 - Interlock
 - Throttle Interlocks
 - Pump Interlocks (if equipped)
 - Aerial Interlocks (if equipped)
 - PTO Interlocks (if equipped)
 - 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.
 - Systems
 - Information display
 - 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
 - Foam
 - Pressure Controller
 - Live Data
 - General Truck Data
- Maintenance
 - Engine oil and filter
 - Transmission oil and filter
 - Pump oil (if equipped)
 - Foam
- 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 indicated
 - 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)
 - Deck Gun
 - Extend-a-Gun Deluge extension in the extended position
- 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)
- Ascendant Set Up Confirmation (if equipped)

Button functions and button labels may change with each screen.

COLLISION MITIGATION

There shall be a HAAS Alert®, Model HA5 Responder-to-Vehicle (R2V) collision avoidance system provided on the apparatus. The HA5 cellular transponder module shall be installed behind the cab windshield, as high and near to the center as practical, to allow clear visibility to

Bidder Complies	
Yes	No

the sky. The module dimensions are 5.40" long x 2.70" wide x 1.30" high, and operating temperature range is -40 degree C to 85 degree C.

The transponder shall be connected to the vehicle's emergency master circuit and battery direct power and ground.

While responding with emergency lights on, the HA5 transponder sends alert messages via cellular network to motorists in the vicinity of the responding truck that are equipped with the WAZE app.

While on scene with emergency lights on, the HA5 transponder sends road hazard alerts to motorists in the vicinity of the truck that are equipped with the WAZE app.

The HA5 Responder-to-Vehicle (R2V) collision avoidance system shall include the transponder and a 5 year cellular plan subscription.

Activation of the HAAS Alert system requires a representative of the customer to accept the End User License Agreement (EULA) via an on-line portal.

VEHICLE DATA RECORDER

There shall be a vehicle data recorder (VDR) capable of reading and storing vehicle information provided.

The information stored on the VDR can be downloaded through a USB port mounted in a convenient location determined by cab model. A USB cable can be used to connect the VDR to a laptop to retrieve required information. The program to download the information from the VDR will be available to download on-line.

The vehicle data recorder 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
- Seat Belt Buckled Status - Yes/No by Position
- Master Optical Warning Device Switch - On/Off
- Time - 24 Hour Time
- Date - Year/Month/Day

Seat Belt Monitoring System

A seat belt monitoring system (SBMS) shall be provided on the color display and in the center overhead of the cab instrument panel. The SBMS shall be capable of monitoring up to 10 seating positions indicating the status of each seat position per the following:

- Seat Occupied & Buckled = Green LED indicator illuminated
- Seat Occupied & Unbuckled = Red LED indicator with audible alarm
- No Occupant & Buckled = Red LED indicator with audible alarm
- No Occupant & Unbuckled = No indicator and no alarm

The seat belt monitoring screen shall become active on the color display when:

- The home screen is active:
 - and there is any occupant seated but not buckled or any belt buckled with an occupant.
 - and there are no other Do Not Move Apparatus conditions present. As soon as all Do Not Move Apparatus conditions are cleared, the SBMS shall be activated.

The SBMS shall include an audible alarm that shall warn that an unbuckled occupant condition exists and the parking brake is released, or the transmission is not in park.

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.

Bidder Complies	
Yes	No

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, electronic control modules to include black housings, a power indicator and status indicator 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:

- 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 programmable to accommodate changes to the vehicle's operating parameters

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 32 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 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

Advanced diagnostic feature shall be provided in this control system. From the display or connected wireless device, these features allow the user to monitor the real-time status of every input or output on the vehicle. It also allows users logged in as an administrator to force on inputs or outputs to assist the troubleshooting process.

Data Logging Module with WiFi

An in cab module shall provide WiFi wireless interface and data logging capability (no exception). The WiFi interface shall comply with IEEE 802.11 b/g/n capabilities while communicating at 2.4 Gigahertz. The module shall communicate through a black WiFi antenna allowing a line of site communication range of up to 300 feet with a roof mounted antenna.

The module shall 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 shall allow vehicle monitoring of the vehicle and firefighting systems on the apparatus. The technician level shall allow diagnostic access to inputs and outputs installed in the control and information system.

The data logging capability shall record faults from the engine, transmission, ABS control and information systems as they occur. No other data shall be recorded at the time the fault occurs. The data logging module shall provide up to 2 Gigabytes of data storage.

The data logging module shall provide a means to download the information and update software in the device.

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.

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.

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 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.

Bidder Complies	
Yes	No

ELECTRICAL SYSTEM PROGNOSTICS

There shall be a software based vehicle tool provided to predict remaining life of the vehicles critical fluid and events.

The system shall send automatic indications to the information center and/or wireless enabled devices to proactively alert of upcoming service intervals.

Prognostics shall include the following:

- Engine oil and filter
- Transmission oil and filter

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 applied completely over the metal portion of the terminal.

Bidder Complies	
Yes	No

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.

BATTERY SYSTEM

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

- 1050 Cranking amps @ 32 degrees Fahrenheit
- 925 CCA (cold cranking amps)
- 190 reserve capacity
- Maintenance free
- Group 31

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 placed on non-corrosive mats and be stored in well ventilated compartments located under the cab and bolted directly to the chassis frame. The battery boxes shall have reinforced sides. The battery compartments shall be constructed of a minimum 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.

Bidder Complies	
Yes	No

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 included on the battery compartments.

BATTERY CHARGER

There shall be an IOTA, Model DLS-75, 75 amp battery charger with IQ4 controller provided or equivalent.

The battery charger shall be wired to the AC shoreline inlet through an AC receptacle adjacent to this battery charger.

REMOTE CONTROL PANEL - BATTERY CHARGER

There shall be a Kussmal™, Model 091-94-12 display panel included. It shall be wired directly to the chassis batteries.

The battery charger indicator shall be located on the driver's seat riser.

KUSSMAUL AUTO EJECT FOR SHORELINE

There shall be one (1) Kussmal Model 091-159-30-120, 30 amp 120 volt AC shoreline inlet(s) provided to operate the dedicated 120 volt AC circuits on the apparatus.

The shoreline inlet(s) shall include black weatherproof flip up cover(s).

There shall be a release solenoid wired to the vehicle's starter to eject the AC connector when the engine is starting.

The shoreline shall be connected to Battery Charger.

A mating connector body shall 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 on the driver side of cab, above wheel.

ALTERNATOR

A Delco Remy®, Model 40SI, alternator shall be provided. It shall have a rated output current of 320 amps, as measured by SAE method J56. The alternator shall feature an integral regulator and rectifier system that has been tested and qualified to an ambient temperature of 257 degrees Fahrenheit (125 degrees Celsius). The alternator 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.
- High Idle to activate before any electric loads are shed and deactivate with the service brake.
 - 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.
- Individual load managed item condition:

- ON = not shed
- 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)

HEADLIGHTS

There shall be four (4) JW Speaker®, Model 8800, 4" x 6" rectangular LED lights mounted in the front quad style, chrome housing on each side of the cab grille:

- the outside light on each side shall contain a part number 055***1 low beam module
- the inside light on each side shall contain a part number 055***1 high beam module
- the headlights to include chrome bezels

The low beam lights shall be activated when the headlight switch is on.

The high beam and low beam lights shall be activated when the headlight switch and the high beam switch is activated.

Bidder Complies	
Yes	No

DIRECTIONAL LIGHTS

There shall be two (2) Whelen 600 series, amber LED combination directional/marker lights provided. The lights shall be located on the outside cab corners, next to the warning lights.

The lens color(s) to be the same as the LEDs.

INTERMEDIATE LIGHT

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

CAB CLEARANCE/MARKER/ID LIGHTS

There shall be seven (7) amber LED lights provided per the following:

- Three (3) amber LED identification lights shall be installed in the center of the cab above the windshield.
- Two (2) amber LED clearance lights shall be installed, one (1) on each outboard side of the cab above the windshield as close to the outside of the apparatus as practical.
- Two (2) amber LED clearance lights shall be installed, one (1) on each side of the cab as high and far forward as practical.

The lights shall be installed without guards.

FRONT CAB SIDE DIRECTIONAL LIGHTS

There shall be two (2) Truck-Lite®, Model 19036Y, amber LED lights installed to the outside of the chrome wrap around bezel, one (1) on each side of the cab.

The lights shall activate as additional directional lights with the corresponding directional circuit.

REAR CLEARANCE/MARKER/ID LIGHTING

There shall be a three (3) LED light bar used as identification lights located at the rear of the apparatus per the following:

- As close as practical to the vertical centerline
- Centers spaced not less than 6.00" or more than 12.00" apart
- Red in color
- All at the same height

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:

- To indicate the overall width of the vehicle
- One (1) each side of the vertical centerline
- As near the top as practical
- Red in color
- To be visible from the rear
- All at the same height

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:

- To indicate the overall length of the vehicle
- One (1) each side of the vertical centerline
- As near the top as practical
- Red in color
- To be visible from the side
- All at the same height

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.

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.

Per FMVSS 108 and CMVSS 108 requirements.

REAR FMVSS LIGHTING

The rear stop/tail and directional lighting included in the rear tail light housing shall include the following:

- Two (2) Whelen®, Model M62BTT, 4.30" high x 6.70" wide x 1.40" deep brake/tail lights with red LEDs
- Two (2) Whelen, Model M62T, 4.30" high x 6.70" wide x 1.40" deep directional lights with amber LEDs. The directional lights shall be set to Steady On (Arrow) flash pattern.
- The lens color(s) to be the same as the LEDs.

There shall be two (2) Whelen Model M62BU, LED backup lights provided in the tail light housing.

Bidder Complies	
Yes	No

LICENSE PLATE BRACKET

One (1) license plate bracket constructed of stainless steel shall be provided at the rear of the apparatus.

One (1) white LED light with chrome housing shall be provided to illuminate the license plate. A stainless steel light shield shall be provided over the light that shall direct illumination downward, preventing white light to the rear.

LIGHTING BEZEL

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

BACK-UP ALARM

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.

CAB PERIMETER SCENE LIGHTS

There shall be four (4) Whelen Model PEL*C, 2.25" high x 7.88" wide x 1.63" deep white LED lights with 45 degree angled chrome bracket provided, one (1) for each cab and crew 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) Whelen®, Model PEL*C, LED 12 volt DC lights 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) Amdor, Model AY-LB-12HW020, 350 lumens, 20.00" long, white LED's, 12 volt DC 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.

Bidder Complies	
Yes	No

ADDITIONAL PERIMETER LIGHTS

There shall be four (4) Whelen Model PEL*C white 12-volt DC LED light(s) with 45 degree chrome mount provided Centered under LS1, LS3, RS1, RS3.

These additional lights shall be controlled with the other body perimeter lights.

ENHANCED SOFTWARE FOR PERIMETER LIGHTS

All perimeter lights shall be deactivated when the parking brake is released unless alternate control is selected.

The cab and crew cab perimeter lights shall remain on for ten (10) seconds for improved visibility after the doors closed.

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.

SIDE SCENE LIGHTS

There shall be four (4) HiViz, Model FT-GESM, surface mount, 20,500 equivalent lumens 8.65" high x 10.61" wide x 2.75" deep light(s) with white LEDs installed on the side of the apparatus, one (1) high and forward on driver's side body, one (1) high and forward on passenger's side body, one (1) over the passengerer's side EMS access door and one (1) over the driver's side EMS access door.

The light(s) shall be activated by the same control that has been selected for the driver's side scene light(s) and by the same control that has been selected for the passenger's side scene light(s).

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

Bidder Complies	
Yes	No

12 VOLT LIGHTING

There shall be a HiViz Model FT-B-72-*-* , 2.56" high x 72.69" long x 3.31" deep 21,067 effective lumens 12 volt DC light with white LEDs configured with a combination of flood and spot optics mounted, as far forward on the cab roof as practical.

The painted parts of the light housing and brackets to be black.

The light shall be activated by a switch at the driver's side switch panel.

The light may be load managed when the parking brake is applied.

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. Hose Bed lights shall meet the photometric levels listed in NFPA 1901 for Hose Bed lighting requirements.

- Light strip(s) shall be installed along the upper edge of the left side of the hose bed.
- Light strip(s) shall be installed along the upper edge of the right side of the hose bed.

The lights shall be activated by a cup switch at the rear of the apparatus no more than 72.00" from the ground.

REAR WORK AREA LIGHTS

There shall be two (2) Whelen®, part number 01-066C520-10, 3.00" x 7.00" white LED scene lights installed at the rear of the vehicle, under the tailboard with a 15 Degree bracket, facing the rear. The lights shall have 12 white LEDs and have no internal optics. The lights shall be mounted on brackets below the truck so as to not interfere with the angle of departure.

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

REAR SCENE LIGHT(S)

There shall be two (2) surface mounted HiViz, Model FT-GESM, 20,500 equivalent lumens 8.65" high x 10.61" wide x 2.75" deep light(s) with white LEDs installed at the rear of the apparatus, Highest point on LS and RS rear of body..

The light(s) to include chrome bezel.

The light(s) shall be controlled by a cup switch at the driver's side rear bulkhead.

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

Bidder Complies	
Yes	No

WALKING SURFACE LIGHTS

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

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

The light shall be activated when the body step lights are on.

WATER TANK

Booster tank shall have a capacity of 750 gallons and be constructed of polypropylene plastic by United Plastic Fabricating, Incorporated.

The tank shall be designed to achieve a low hose bed. Tank design shall be a stepped design with the forward section of the tank higher than the section of the tank that is below the hose bed.

Tank joints and seams shall be nitrogen welded inside and out.

Tank shall be baffled in accordance with NFPA Bulletin 1901 requirements.

Baffles shall have vent openings at both the top and bottom to permit movement of air and water between compartments.

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

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

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

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

Tank 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.

Bidder Complies	
Yes	No

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

Sump shall include a drain plug and the tank outlet.

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

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

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.

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

Mounting system shall be approved by the tank manufacturer.

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

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

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

SLEEVE, PLUMBING, THROUGH TANK

One (1) sleeve 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.

HOSE BED

The hose bed shall be fabricated of 0.125"-5052 aluminum with a nominal 38,000 psi tensile strength.

The hose bed shall be as low as practical.

Bidder Complies	
Yes	No

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.

A cross divider shall be provided at the front of the hose bed before the tank transitions from the lower section to the upper section. The divider shall run from the top of the side sheet down below the hose bed grating.

The hose bed interior walls shall be painted to match the lower body color.

The hose bed shall accommodate 1000 feet of 4.00" hose, 200 feet of 1 3/4" hose and 600' feet of 3.00" hose.

HOSE BED DIVIDER

Three (3) 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.

HOSE BED HOSE RESTRAINT

The hose in the hose bed shall be restrained by a pair of black nylon Velcro® straps at the top of the hose bed. An additional pair of black nylon Velcro® straps may be provided if needed. At the rear of the hose bed, 2.00" black nylon webbing with a 1.50" x 4.00" box pattern shall attach at the top rear outside corners with seat belt buckle fasteners. The webbing shall have straps connected with seat belt buckle fasteners located at the rear body sheet below the hose bed.

A cross-divider shall be provided just behind the fill tower. The divider shall be bolted to the side sheet.

CUTOUT, HANDHOLD

A cutout with radiused corners shall be provided at the rear of the three (3) hose bed divider(s).

HOSE BED COVER ELECTRIC ACTUATOR

A two (2) section hose bed cover, constructed of .125" bright aluminum treadplate shall be furnished. The cover shall be hinged with full length stainless steel piano hinge. The sides shall be slanted down with the center of the cover supported by a modular stationary bridgework support. The covers shall not over lap.

The cover shall be reinforced so that it can support the weight of a man walking on the cover.

A pneumatic gas spring assist shall be installed at the front of the covers to help support and stabilize the cover throughout its range of motion.

If access to water tank fill tower is blocked by the hose bed cover, then a hinged door shall be provided in it so that tank may be filled without raising cover doors.

Chrome grab handles and two (2) (one (1) each side) electric linear actuator with brake cylinders shall be provided to assist in opening and closing the cover. A rubber-covered momentary toggle switch shall be provided for each actuator that controls the opening and closing of the covers. Each switch shall be located at the rear body of the body at the left side. Additional locks on top of the cover are not required to secure the cover in the nested position.

A cross divider shall be provided directly behind the actuators, at the front of the hose bed, to support the actuators and provide a clean appearance.

A handrail shall be provided at the rear, in the center of the support, to assist in climbing up the back of the truck.

The hose bed cover shall be connected to the Do Not Move Truck indicator. The light shall be activated if the cover is not in the stowed position and the parking brake is released.

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.

Bidder Complies	
Yes	No

TAILBOARD

The tailboard shall also be constructed of .125" bright aluminum treadplate and spaced .50" from the body, as well as supported by a structural steel assembly.

The tailboard area shall be 16.00" deep and full width of the body. The outboard sides of the tailboard shall be angled at 45 degrees beginning at the point where the body meets the tailboard at the outboard edge angling rearward to the rear edge of the tailboard.

The exterior side shall be flanged down and in for increased rigidity of tailboard structure.

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.

The rear wall shall be flush.

REAR TOW EYES

Two (2) tow eyes, which are an integral part of the body mounting substructure, shall be installed below the rear of the truck.

The tow eyes shall be of adequate strength to allow the truck to be pulled from the eyes.

REAR TOW BAR

One (1) tow bar shall be installed under the tailboard.

The tow bar assembly shall be designed and positioned to allow up to a 30-degree upward angled pull of 17,000 lb, or a 20,000 lb straight horizontal pull in line with the centerline of the vehicle.

The tow bar design shall have been tested and evaluated using finite element analysis techniques.

COMPARTMENTATION

Body and compartments shall be fabricated of 0.125", 5052-H32 aluminum.

Side compartments shall be an integral assembly with the rear fenders.

Bidder Complies	
Yes	No

Circular fender liners shall be provided for prevention of rust pockets and ease of maintenance.

Side compartment flooring shall be of the sweep out design with the floor higher than the compartment door lip.

The side compartment door opening shall be framed by flanging the edges in 1.75" and bending out again 0.75" 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 is designed for sustaining maximum loads.

Forward to the rear axle, the support system shall include "L"-shaped support members bolted to the chassis frame rails. These welded support members shall include vertical formed channels, horizontal structural channels, and support gussets. These parts extend from the chassis frame outward underneath the body.

Rearward to the rear axle, the body support system shall include two rearward facing "L"-shaped support members bolted to the chassis frame rails. These support members shall be connected to the two body supporting crossmembers forming a boxed foundation for the rear body support system.

Steel upper platform decks shall be mounted on the top of these support members to create a floating substructure which shall result in a 500 lb equipment support rating per lower compartment.

All structural components of this system shall be made from high strength 50K steel plate material or structural steel componentry. The steel frames as well as the steel vertical angles

shall be treated with an epoxy E-coat to provide resistance to corrosion and chemicals as standard.

The floating substructure shall be separated from the horizontal members with neoprene elastomer isolators. These isolators shall reduce the natural flex stress of the chassis from being transmitted to the body.

Isolators shall have a broad load range, proven viability in vehicular applications, be of a fail-safe design and allow for all necessary movement in three (3) transitional and rotational modes.

The neoprene isolators shall be installed in a pattern which assimilates a three (3)-point mounting pattern to reduce the natural flex of the chassis being transmitted to the body.

A design with body compartments hanging on the chassis in an unsupported fashion 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.

LOUVERS

Louvers shall be stamped into compartment walls to provide the proper airflow inside the body compartments and to prevent water from dripping into the compartment. Where these louvers are provided, they shall be formed into the metal and not added to the compartment as a separate plate.

TESTING OF BODY DESIGN

Body structural analysis shall be fully tested. Proven engineering and test techniques such as finite element analysis, strain gauging, and model analysis shall be performed with special attention given to fatigue, life and structural integrity of the body and substructure.

Body shall be tested while loaded to its greatest in-service weight.

The criteria used during the testing procedure shall include:

- Raising opposite corners of the vehicle tires 9.00" to simulate the twisting a truck may experience when driving over a curb.
- Making a 90 degree turn, while driving at 20 mph to simulate aggressive driving conditions.
- Driving the vehicle at 35 mph on a washboard road.
- Driving the vehicle at 55 mph on a smooth road.

- Accelerating the vehicle fully, until reaching the approximate speed of 45 mph on rough pavement.

Evidence of actual testing techniques shall be made available upon request.

LEFT SIDE COMPARTMENTATION

The left side compartmentation shall consist of three lap door compartments.

A full height, vertically hinged, double door compartment ahead of the rear wheels shall be provided. The interior dimensions of this compartment shall be 44.00" wide x 66.63" high x 25.88" deep in the lower 25.00" of the compartment and 12.00" deep in the remaining upper portion. The clear door opening shall be a minimum of 37.00" wide x 61.88" high.

A horizontally hinged, single lift-up door compartment over the rear wheels shall be provided. The interior dimensions of this compartment shall be 66.50" wide x 32.88" high x 12.00" deep. The clear door opening shall be a minimum of 59.25" wide x 27.00" high.

A full height, vertically hinged, double door compartment behind the rear wheels shall be provided. The interior dimensions of this compartment shall be 47.75" wide x 67.63" high x 25.88" deep in the lower 26.00" of the compartment and 12.00" deep in the remaining upper portion. The clear door opening shall be a minimum of 43.50" wide x 62.88" high.

The interior height of the compartments shall be measured from the compartment floor to the ceiling. The depth of the compartments shall be measured from the back wall to the inside of the door frame.

Closing of the doors shall not require releasing, unlocking, or unlatching any mechanism and shall easily be accomplished with one hand.

The vertically hinged doors shall be furnished with a positive door holder.

The lift-up door shall be furnished with two gas-charged cylinders to assist in the opening of the door and to maintain the door in an open position. There shall be a field adjustable, three-position bracket mounted on the vertical side door opening that shall allow the door to be held open at 87°, 90°, or 93°.

RIGHT SIDE COMPARTMENTATION

The right side compartmentation shall consist of three lap door compartments.

A full height, vertically hinged, double door compartment ahead of the rear wheels shall be provided. The interior dimensions of this compartment shall be 44.00" wide x 66.63" high x 25.88" deep in the lower 25.00" of the compartment and 12.00" deep in the remaining upper portion. The clear door opening shall be a minimum of 37.00" wide x 61.88" high.

Bidder Complies	
Yes	No

A horizontally hinged, single lift-up door compartment over the rear wheels shall be provided. The interior dimensions of this compartment shall be 66.50" wide x 32.88" high x 12.00" deep. The clear door opening shall be a minimum of 59.25" wide x 27.00" high.

A full height, vertically hinged, double door compartment behind the rear wheels shall be provided. The interior dimensions of this compartment shall be 47.75" wide x 67.63" high x 25.88" deep in the lower 26.00" of the compartment and 12.00" deep in the remaining upper portion. The clear door opening shall be a minimum of 43.50" wide x 62.88" high.

The interior height of the compartments shall be measured from the compartment floor to the ceiling. The depth of the compartments shall be measured from the back wall to the inside of the door frame.

Closing of the doors shall not require releasing, unlocking, or unlatching any mechanism and shall easily be accomplished with one hand.

The vertically hinged doors shall be furnished with a positive door holder.

The lift-up door shall be furnished with two gas-charged cylinders to assist in the opening of the door and to maintain the door in an open position. There shall be a field adjustable, three-position bracket mounted on the vertical side door opening that shall allow the door to be held open at 87°, 90°, or 93°.

SIDE COMPARTMENT DOORS

All hinged compartment doors shall be lap style with double panel construction and shall be a minimum of 1.50" thick. The doors shall be made out of the same material as the body. 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 be acceptable.)

All door locking 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 FMVSS approved door locking mechanisms.

Bidder Complies	
Yes	No

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 COMPARTMENTATION

A roll-up door compartment above the rear tailboard shall be provided.

The interior dimensions of this compartment shall be 40.00" wide x 33.63" high x 25.88" deep. The interior height of the compartments shall be measured from the compartment floor to the ceiling. The spool of the rollup door at the top of the compartment takes up some usable space. The depth of the compartments shall be measured from the back wall to the inside of the door frame.

A louvered, removable access panel shall be furnished on the back wall of the compartment.

The rear compartment shall be open into the rear side compartments.

The clear door opening of this compartment shall be a minimum of 33.25" wide x 23.88" high.

Closing of the door shall not require releasing, unlocking, or unlatching any mechanism and shall easily be accomplished with one hand.

ROLLUP REAR COMPARTMENT DOOR

The rear roll up door shall be double faced aluminum construction, painted one (1) color to match the lower portion of the body and manufactured by R-O-M Corporation.

The slats shall be double wall box frame extrusion. The exterior surface shall be flat and the interior surface shall be concaved to help loose equipment fall to the ground and prevent loose equipment from jamming the door.

Between each slat shall be a PVC inner seal to prevent metal to metal contact and prevent dirt or moisture from entering the compartments.

A non-locking liftbar to be provided for each roll-up door. The lift bar shall be located at the bottom of the door and have latches on the outer extrusion of the door frame. A ledge shall be supplied over the lift bar as additional area to aid in closing the door.

Each door shall have a 4.00" counter balance to assist in lifting.

A heavy-duty magnetic switch shall be used for control of open compartment door warning lights.

COMPARTMENT LIGHTING

There shall be seven (7) 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 without light strips shall have a 6.00" diameter Truck-Lite, Model: 79384 light. Each light shall have a number 1076 one filament, two wire bulb.

Opening the compartment door shall automatically turn the compartment lighting on.

MOUNTING TRACKS

There shall be six (6) sets of tracks for mounting shelf(s) in LS1, LS2, LS3, RS1, RS2 and RS3. These tracks shall be installed vertically to support the adjustable shelf(s). The tracks shall be painted to match the compartment interior.

ADJUSTABLE SHELVES

There shall be nine (9) shelves with a capacity of 500 lb provided.

The shelf construction shall consist of .188" aluminum painted spatter gray with 2.00" sides.

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(s) shall be in RS1 centered between the floor and the ceiling, in RS2 centered between the floor and the ceiling, in RS3 centered between the floor and the ceiling, in RS1 in the lower third, in RS3 in the lower third, in LS1 centered between the floor and ceiling, in LS2 centered between the floor and ceiling, in LS3 centered between the floor and ceiling and in LS1 in the lower third to the left of the partition.

SLIDE-OUT FLOOR MOUNTED TRAY

There shall be four (4) floor mounted slide-out tray(s) provided.

Each tray shall have 2.00" high sides and a minimum capacity rating of 500 lb in the extended position.

Each tray shall be constructed of aluminum painted spatter gray

There shall be two undermount-roller bearing type slides rated at 250lb each provided. The pair of slides shall have a safety factor rating of 2.

Bidder Complies	
Yes	No

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.

The location(s) shall be RS1, RS3, LS1 and LS3.

SWING OUT TOOLBOARD

A swing out aluminum toolboard shall be provided.

It shall be a minimum of .188" thick without holes in the board.

A 1.00" x 1.00" aluminum tube frame shall be welded to the edge of the pegboard.

The board shall be mounted on a pivoting device at the front of the compartment on the top and bottom to allow easy movement in and out of the compartment. The maximum tool load shall be 400 pounds.

The board shall have positive lock in the stowed and extended position.

The board shall have a D-ring handle to secure it in the stowed position

The board shall be mounted on adjustable tracks from front to back within the compartment.

There shall be One (1) toolboard(s) provided. The toolboard(s) shall be spatter gray painted and installed upper part of RS1.

RUB RAIL

Bottom edge of the side and rear of the body 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.

Bidder Complies	
Yes	No

BODY FENDER CROWNS

Polished stainless steel fender crowns shall be provided around the rear wheel openings with a dielectric barrier shall be provided between the fender crown and the fender sheet metal to prevent corrosion.

The fender crowns shall be held in place with stainless steel screws that thread directly into a composite nut and not directly into the parent body sheet metal to eliminate dissimilar metals contact and greatly reduce the chance for corrosion. Rubber welting shall be provided between the body and crown.

BODY FENDER LINER

A painted to match the lower body color fender liner shall be provided. The liners shall be removable to aid in the maintenance of rear suspension components.

HARD SUCTION HOSE

Hard suction hose shall not be required.

HARD SUCTION HOSE COMPARTMENT

A total of two (2) enclosed hard suction hose compartment(s) shall be provided one (1) on the left side and one (1) on the right side above the body compartment(s) and capable of storing one (1) hard suction hose per compartment. The compartment(s) shall run the full length of the body.

One (1) aluminum unpainted trough shall be provided inside the compartment(s).

The compartment(s) shall be fabricated of the same material as the body with the exterior painted, and aluminum treadplate surface on top of the compartment..

One (1) painted aluminum door with a Southco C2 chrome raised trigger lever latch hinged on the top with pneumatic cylinder(s), shall be provided at the rear of each compartment.

HANDRAILS

The handrails shall be 1.25" diameter knurled aluminum 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.

Bidder Complies	
Yes	No

Handrails shall be provided to meet NFPA 1901 section 15.8 requirements. The handrails shall be installed as noted on the sales drawing.

HANDRAILS

One (1) vertical handrail shall be located on each rear beavertail.

One (1) horizontal black rubber-covered handrail shall be provided above the hose bed at the rear of the apparatus. The hose bed dividers shall be tied to the upper handrail or cross bar in order to provide sufficient reinforcement.

AIR BOTTLE STORAGE (DOUBLE)

A quantity of four (4) air bottle compartments, 15.25" wide x 7.75" tall x 26.00" deep, shall be provided on the left side forward of the rear wheels, on the left side rearward of the rear wheels, on the right side forward of the rear wheels and on the right side rearward of the rear wheels . A polished stainless steel door with a Southco raised trigger C2 chrome lever 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, Duo-Safety, Series 1200-A extension ladder provided.

ROOF LADDER

There shall be one (1) 16' aluminum Duo-Safety Series 875-A roof ladder(s) provided.

LADDER STORAGE

The ladders shall be stored between the water tank and the right-side compartments.

The ladders shall extend into the pump compartment just to the rear of the water pump discharges.

The ladder storage area shall be enclosed as practical by means of sheet metal to protect the ladders from road dirt. The ladders that extend into the pump house shall also be enclosed. A removable black rubber boot shall be provided to enclose the ladders in the gap between the pump house and the body.

Each ladder shall be stored vertically in a separate stainless steel storage trough. Each stainless steel trough shall be lined with Dura-Surf nylon slides.

Bidder Complies	
Yes	No

An aluminum enclosure shall be provided at the rear of the body to properly contain the ladders. This enclosure shall extend to the rear of the side body compartments.

The enclosure shall also include a vertically hinged smooth aluminum door with a pair of Southco raised trigger C2 chrome latches to access the ladders. The door shall be hinged on the left side.

On the rear wall, there shall be a bright aluminum treadplate scuffplate around the door for the ladder enclosure.

An additional stainless steel trough shall be provided in the equipment storage compartment for storage of a third ladder.

FOLDING LADDER

One (1) 10.00' aluminum, Series 585-A, Duo-Safety folding ladder shall be installed.

FOLDING LADDER STORAGE

There shall be storage designated right side for folding ladders stored between the side sheet in a stainless steel trough in the ladder storage compartment.

PIKE POLE PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, Section 5.9.4 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.

The pike pole(s) shall be a Duo-Safety 10' pike pole.

PIKE POLE STORAGE

There shall be storage designated right side for One (1) pike pole 8' or longer pike poles stored in a tube between the side sheet and tank in the ground ladder storage compartment.

6' PIKE POLE PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, Section 5.9.4 requires one (1) 6' 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.

Bidder Complies	
Yes	No

The pike pole(s) shall be a Duo-Safety 6' pike pole.

PIKE POLE STORAGE

There shall be storage designated right side for One (1) pike pole with a .75" standard notch stored in a tube between the side sheet and tank in the ground ladder storage compartment.

REAR FOLDING STEPS

Bright finished, non-skid folding steps with a black tread coating on the stepping surface shall be provided at the rear. Each step shall incorporate an LED light to illuminate the stepping surface. The steps can be used as a hand hold with two openings wide enough for a gloved hand.

PUMP COMPARTMENT

The pump compartment shall be separate from the hose body and compartments so that each may flex independently of the other. The pump compartment shall be constructed of the same material as the body compartmentation.

The pump compartment substructure 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 PANEL

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:

Bidder Complies	
Yes	No

The upper section shall contain sub panels for the mounting of the pump pressure control device, engine monitoring gauges, electrical switches, and foam controls. 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 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.

PUMPHOUSE STRUCTURE

A special pumphouse structure is required to accommodate the roof ladder and a wider extension ladder stored between the tank and the side sheet. The right side supports will need to be modified to accommodate the extension ladder storage.

PUMP

Pump shall be a Waterous CSU, 1500 gpm single (1) stage midship mounted centrifugal type.

Pump shall be the class "A" type.

	Bidder Complies	
	Yes	No
<p>Pump shall deliver the percentage of rated discharge at pressures indicated below:</p> <ul style="list-style-type: none"> - 100% of rated capacity at 150 psi net pump pressure. -70% of rated capacity at 200 psi net pump pressure. -50% of rated capacity at 250 psi net pump pressure. <p>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).</p> <p>Pump shall be designed for complete servicing from the bottom of the truck, without disturbing the pump setting or apparatus piping.</p> <p>Pump case halves shall be bolted together on a single horizontal face to minimize chance of leakage and facilitate ease of reassembly. No end flanges shall be used.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>Pump shall be equipped with a self-adjusting, maintenance-free, mechanical shaft seal.</p> <p>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.</p> <p>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.</p> <p>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.</p>		

Bidder Complies	
Yes	No

PUMP TRANSMISSION

The pump transmission shall be made of a three (3) piece, aluminum, horizontally split casing. Power transfer to pump shall be through a high strength Morse HY-VO silent drive chain. By the use of a chain rather than gears, 50% of the sprocket shall be accepting or transmitting torque, compared to two (2) or three (3) teeth doing all the work.

Drive shafts shall be 2.35" diameter hardened and ground alloy steel and supported by ball bearings. The case shall be designed to eliminate the need for water cooling.

PUMPING MODE

An interlock system shall be provided to ensure that the pump drive system components are properly engaged so that the apparatus can be safely operated. The interlock system shall be designed to allow stationary pumping only.

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 left side 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 pump".

The pump shift shall be interlocked to prevent the pump from being shifted out of gear when the chassis transmission is in gear to meet NFPA requirements.

The pump shift control in the cab 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. The heat exchanger 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. The exchanger shall be plumbed to the master drain valve.

Bidder Complies	
Yes	No

INTAKE RELIEF VALVE - PUMP

There shall be One (1) Waterous Model #83827 relief valve(s) installed on the suction side of the pump preset at 125 psig.

The relief valve(s) shall have a working range of 50 psi to 250 psi.

The 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.

PRESSURE CONTROLLER

A Fire Research, INCONTROL Model TGA400 pressure governor shall be provided.

A pressure transducer shall be installed in the water discharge and intake manifold on the pump.

The display panel shall be located at the pump operator's panel.

PRIMING PUMP

The priming pump shall be a Trident Emergency Products compressed air powered, high efficiency, multistage venturi based AirPrime System, conforming to standards outlined in the current edition of NFPA 1901.

All wetted metallic parts of the priming system are to be of brass and stainless steel construction.

One (1) priming control shall open the priming valve and start the pump primer. The control shall have a three position switch for automatic, off or test. In the sentry mode (automatic) the primer shall sense when the pump losses discharge pressure and start the pump primer. The primer shall automatically stop once the pump has pressure.

A vacuum gauge shall indicate the vertical elevation of water in feet during priming operation.

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) electronic copies. Each manual shall cover pump operation, maintenance, and parts.

Bidder Complies	
Yes	No

PLUMBING, STAINLESS STEEL AND HOSE

All inlet and outlet lines shall be plumbed with either stainless steel pipe, flexible polypropylene tubing or synthetic rubber hose reinforced with hi-tensile polyester braid. All hose's shall be equipped with brass or stainless steel couplings. All stainless steel hard plumbing shall be a minimum of a schedule 10 wall thickness.

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

Plumbing manifold bodies shall be ductile cast iron or stainless steel.

All piping lines are to be drained through a master drain valve or shall be equipped with individual drain valves. All drain lines shall be extended with a hose to drain below the chassis frame.

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

All piping, hose and fittings shall have a minimum of a 500 PSI hydrodynamic pressure rating.

FOAM SYSTEM PLUMBING

All piping that is in contact with the foam concentrate or foam/water solution shall be stainless steel. The fittings shall be stainless steel or brass. Cast iron pump manifolds will be allowed.

MAIN PUMP INLETS

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

SHORT SUCTION TUBE(S)

The suction tube(s) on the water pump shall have short suction tube(s) installed to allow for installation of adapters, elbows or intake valves without excessive overhang.

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).

Bidder
Complies
Yes No

VALVES

All ball valves shall be Akron® Brass in-line valves. The Akron valves shall be the 8000 series heavy-duty style with a stainless steel ball and a simple two-seat design. No lubrication or regular maintenance is required on the valve.

Valves shall have a **ten (10) year** warranty.

The location of the valve for the one (1) inlet shall be recessed behind the pump panel.

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.

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.

ANODE, INLET

One (1) pair of sacrificial Zinc anodes shall be provided in the water pump to protect the pump from corrosion. One (1) shall be placed in the inlet side of the pump and the other one (1) in the discharge side of the pump.

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 "T" 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.

Bidder Complies	
Yes	No

TANK TO PUMP

The booster tank shall be connected to the intake side of the pump with stainless steel piping and a quarter turn 3.00" full flow line valve with the control remotely located at the operator's panel. Tank to pump line shall run straight (no elbows) from the pump into the front face of the water tank and angle down into the tank sump. A rubber coupling 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 1.50" 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.

DISCHARGE OUTLET CONTROLS

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.

SWING CONTROLS

There shall be Eight (8) discharge outlets controlled by a vertical swing style control. These controls shall be located on the following discharges Front bumper discharge, front crosslay, center crosslay, rear crosslay, LS pump panel discharge, LS rear discharge, RS pump panel master (LDH) discharge RS pump panel discharge (2.5)..

LEFT SIDE DISCHARGE OUTLETS

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

LEFT SIDE OUTLET ELBOWS

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).

Bidder Complies	
Yes	No

RIGHT SIDE DISCHARGE OUTLETS

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.

RIGHT SIDE OUTLET ELBOWS

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).

There shall be One (1) discharge outlet with a 3.00" valve on the right side of the apparatus, terminating with a 4.00" (M) National Standard hose thread adapter. The outlet shall be controlled at the operator's panel.

Any 3.00 inch or larger discharge valve shall be a slow-operating valve in accordance with NFPA 16.7.5.3.

ADDITIONAL RIGHT SIDE OUTLET ELBOWS

The 4.00" outlet shall be furnished with a 4.00" (F) National Standard hose thread x 5.00" Storz elbow adapter with Storz cap.

FRONT DISCHARGE OUTLET

There shall be one (1) 1.50" discharge outlet piped to the front of the apparatus and located in the center bumper tray.

Plumbing shall consist of 2.00" piping and flexible hose with a 2.00" full flow valve with control at the pump operator's panel. A fabricated weldment made of stainless steel pipe shall be used in the plumbing where appropriate. The piping shall terminate with a 1.50" NST with 90 degree stainless steel swivel.

There shall be automatic drains provided at all low points of the piping.

REAR DISCHARGE OUTLET

There shall be One (1) discharge outlet piped to the rear of the hose bed, left side, installed so proper clearance is provided for spanner wrenches or adapters. Plumbing shall consist of 2.50" piping along with a 2.50" full flow ball valve with the control from the pump operator's panel.

Bidder Complies	
Yes	No

REAR OUTLET ELBOWS

The 2.50" discharge outlets located at the rear of the apparatus 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).

DISCHARGE CAPS/ INLET PLUGS

Chrome plated, rocker lug, caps with chain shall be furnished for all discharge outlets 1.00" thru 3.00" in size, besides the pre-connected hose outlets.

Chrome plated, rocker lug, plugs with chain shall be furnished for all auxiliary inlets 1.00" thru 3.00" in size.

The caps and plugs shall incorporate a thread design to automatically relieve stored pressure in the line when disconnected (no exception).

OUTLET BLEEDER VALVE

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 T 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 T 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.

DELUGE RISER

A 3.00" deluge riser shall be installed above the pump so that a monitor can be mounted and used effectively. Piping shall be installed securely so no movement develops when the line is charged.

Bidder Complies	
Yes	No

The riser shall be gated and controlled at the pump operator's panel. A second 3.00" valve shall be provided for this outlet. This additional inline valve shall be located at the outlet with a swing handle control.

Any 3.00 inch or larger discharge valve shall be a slow-operating valve in accordance with NFPA 16.7.5.3.

MONITOR

A Task Force Crossfire Series XFC-42 monitor package shall be properly installed on the deluge riser.

The monitor package shall include a Crossfire monitor with a 10.00" stream shaper and quad stack tips.

A Safe-Tak portable base unit with one (1) 4.00" Storz inlet shall be provided.

The monitor shall be painted as provided by monitor manufacturer.

The deluge riser Extend-a-Gun shall have provisions for direct mounting a Task Force Tips CrossFire monitor. The Extend-a-Gun shall be connected to the Do Not Move Truck indicator. The light shall be activated if the extension is not in the stowed position and the parking brake is released.

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 fabricated of .25" aluminum and shall provide adjustment from side to side. The divider shall be unpainted with a DA finish. The remainder of the crosslay bed shall be painted job color.

Scuffplates shall be provided on both sides, at the sides and bottom of each opening to protect the paint.

CROSSLAY HOSE BEDS, 2.50"

One (1) crosslay with 2.50" outlets shall be provided. This bed to be capable of carrying 200 feet of 2.50" double jacketed hose in a single stack and shall be plumbed with 2.50" i.d. pipe and gated with a 2.50" quarter turn ball valve.

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 fabricated of .25" aluminum and shall provide adjustment from side to side. The divider shall be unpainted with a brushed finish.

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.

CROSSLAY HOSE RESTRAINT

A 2.00" black nylon webbing design restraint shall be provided across the top and ends of two (2) crosslay(s) to secure the hose during travel. The webbing assembly is to be attached at the bottom of the crosslays with footman loops with a permanent attachment and is to attach at the top outside corners with seat belt buckles. The male end of the seat buckle shall be permanently attached to the footman loop at the top of the opening. A nylon strap shall be attached to the seat belt buckle for releasing the buckle on the webbing.

Velcro® shall be attached to the top of the crosslay opening to secure restraint during travel.

CROSSLAY 8.00" LOWER THAN STANDARD

The crosslays shall be lowered 8.00" from standard.

FOAM CONCENTRATE PROPORTIONING SYSTEM

A Foam Pro 2001 foam proportioning system shall be installed in accordance with manufacturer's recommendations. The Foam Pro control unit shall be mounted on the panel at a location determined during the preconstruction meeting and indicated in the manufacturer's pump panel diagrams. The foam system shall only be used for Class A type foams.

The foam system shall be plumbed to four (4) discharges. The discharges capable of dispensing foam shall be Front bumper discharge, front crosslay, center crosslay and rear crosslay.

Bidder Complies	
Yes	No

The foam proportioning system operation shall be based on a direct measurement of water flows, and remain consistent within the specified flow and pressure. The system shall be equipped with a digital electronic control display on the pump panel. Incorporated within the control display shall be a microprocessor, which receives input from the system flow meter while also monitoring the foam concentrate pump output. The microprocessor shall compare the values of the water flow versus the foam flow, to ensure the proportion rate is accurate.

One (1) paddle wheel shall be installed to monitor all foam discharges.

One (1) check valve shall be installed in the plumbing to prevent foam from contaminating the water pump. The check valve shall be approved by the foam system manufacturer.

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 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

The foam tank drain shall be a 1.00" drain valve located inside the pump compartment accessible through a door on the right side pump panel.

The following drawing(s) shall be provided for approval by the customer. The drawing(s) shall be made for up One (01) Truck apparatus and/or similar manufacturers job number.

PUMP OPERATOR'S PANEL DRAWING

A detailed drawing to scale of the pump operator's panel shall be provided for the customer to review. The drawing shall include all of the gauges, controls, switching, etc., located on the pump operator's panel. The customer will be allowed to make changes and/or mark-ups to this approval drawing. The fire apparatus manufacturer shall make revisions (If needed) to the drawing per the customer changes and/or mark-ups as long as the changes are physically possible within a specific product line.

The finalized and signed customer approved pump operator's panel drawing shall become part of the contract documents.

Due to the way drain(s), bleeder(s), operational/maintenance tag(s) and NFPA required warning tag(s) are placed on pump panel(s), these items will NOT be shown on any pump panel approval drawing(s). These item(s) will be placed on pump panel(s) at the fire apparatus manufacturer discretion.

Bidder Complies	
Yes	No

COLOR CODED TAGS

A detailed drawing/chart of the colors used on all of the inlet(s) and outlet(s) shall be provided for the customer to review. The customer will be allowed to make changes and/or mark-ups to this approval drawing/chart. The fire apparatus manufacturer shall make revisions (If needed) to the drawing per the customer changes and/or mark-ups as long as the changes are physically possible within a specific product line.

The finalized and signed customer approved drawing/chart of the colors shall become part of the contract documents.

SPECIAL TEXT/VERBIAGE TAGS

A detailed drawing/chart of the text/verbiage used on all of the inlet(s) and outlet(s) shall be provided for the customer to review. The customer will be allowed to make changes and/or mark-ups to this approval drawing/chart. The fire apparatus manufacturer shall make revisions (If needed) to the drawing per the customer changes and/or mark-ups as long as the changes are physically possible within a specific product line.

The finalized and signed customer approved drawing/chart of the text/verbiage shall become part of the contract documents.

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 stainless steel with a brushed finish. A polished aluminum trim molding shall be provided on both sides of the pump panel.

PUMP ACCESS

Right Side Panel

The right side upper pump panel shall be removable.

Panel Fastener

The removable panels shall be secured with chrome lift and turn latch.

The left side pump panels shall be attached with screws.

The right side lower pump panel (drain bank) shall be attached with screws.

Bidder Complies	
Yes	No

Front Pump House Access

On the front of the pump house structure, provisions shall be provided for access to the pump. A(n) aluminum treadplate panel shall incorporate two D- handle latches to aid in removing the panel.

PUMP COMPARTMENT LIGHT

There shall be one (1) Whelen®, Model 3SC0CDCR, 3.00" white 12 volt DC LED light(s) with Whelen, Model 3FLANGEC, flange(s) installed in the pump compartment.

PUMP PANEL GAUGES AND CONTROLS

The following shall be provided on the pump and gauge panels in a neat and orderly fashion. These gauges shall be in addition to what is provided with the pressure controller.

- Engine Oil Pressure Gauge: With visual and audible warning
- Engine Water Temperature Gauge: With visual and audible warning
- Tachometer: Electric
- Master Pump Drain Control
- Voltmeter
- Fuel

THROTTLE READY GREEN INDICATOR LIGHT

There shall be a green indicator light integrated with the pressure governor and/or engine throttle installed on the pump operators panel that is activated when the pump is in throttle ready mode.

OK TO PUMP INDICATOR LIGHT

There shall be a green indicator light installed on the pump operators panel that is activated when the pump is in Ok To Pump mode.

AIR HORN SWITCH

An air horn control switch shall be provided at the pump operator's control panel. This switch shall be red and properly labeled. The switch shall be located within easy reach of the operator in the electrical switch panel.

Bidder Complies	
Yes	No

VACUUM AND PRESSURE GAUGES

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

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.

PRESSURE GAUGES

The individual "line" pressure gauges for the discharges shall be interlube filled and manufactured by Class 1©.

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.

WATER LEVEL GAUGE

A Fire Research TankVision Pro model WLA300-A00 water tank indicator gauge shall be installed on the pump operators panel. The gauge kit shall include an electronic indicator module, a pressure sensor, and a 10' sensor cable. The gauge shall show the volume of water in the tank on nine (9) easy to see super bright RGB LEDs. A wide view lens over the LEDs

Bidder Complies	
Yes	No

shall provide for a viewing angle of 180 degrees. The gauge case shall be waterproof, manufactured of Polycarbonate/Nylon material, and have a distinctive blue label.

The program features shall be accessed from the front of the indicator module. The program shall support self-diagnostics capabilities, self-calibration, six (6) programmable colored light patterns to display tank volume, adjustable brightness control levels and a data link to connect remote indicators. Low water warnings shall include flashing LEDs at 1/4 tank and down chasing LEDs when the tank is almost empty.

The gauge shall receive an input signal from an electronic pressure sensor. The sensor shall be mounted from the outside of the water tank near the bottom. No probe shall be placed on the interior of the tank. Wiring shall be weather resistant and have automotive type plug-in connectors.

REMOTE LIGHT DRIVER

A Fire Research TankVision model WLA290-A00 remote light driver shall be installed. The driver shall provide four (4) separate outputs to control additional water level lights around the apparatus. The lights shall show 1/4, 1/2, 3/4, and full tank. When power is applied the driver shall run a test and cycle each remote light on and off. When the tank is less than 1/4 full the 1/4 tank light shall blink.

WATER LEVEL GAUGE

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

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

- First green module indicates a full water level
- Second blue module indicates a water level above 3/4 full
- Third amber module indicates a water level above 1/2 full
- Last red module indicates a water level above 1/4 full and empty
 - Above 1/4 this light shall be steady burning
 - At empty this light shall be flashing

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

This module shall be activated when the ignition switch and parking brake is applied.

FOAM LEVEL GAUGE

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, ultra-bright five (5) LED design viewable through 180 degrees. The foam level indicators shall be as follows:

- 100 percent = Green
- 75 percent = Yellow
- 50 percent = Yellow
- 25 percent = Yellow
- Refill = Red

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.

LIGHT SHIELD

There shall be a polished, 16-gauge stainless steel light shield installed over the pump operator's panel.

- There shall be 12-volt DC white LED lights installed under the stainless steel light shield 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.

AIR HORN SYSTEM

Two (2) Hadley, rectangular bell air horns shall be provided. The horns shall be mounted low through the lower bumper flange. The horn system shall be piped to the air brake system wet

Bidder Complies	
Yes	No

tank utilizing 0.38" tubing. A pressure protection valve shall be installed in-line to prevent the loss of air in the air brake system.

Air Horn Location

The air horns shall be located on each side of the bumper, towards the outside.

Air Horn Control

The air horns shall be actuated by a chrome push button located on the officer's side of the engine tunnel and by the horn button in the steering wheel. The driver shall have the option to control the air horns or the chassis horns from the horn button by means of a selector switch located on the instrument panel.

ELECTRONIC SIREN

A Whelen®, Model 295SLSA1, electronic siren 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.

Electronic siren head shall be recessed in the driver side center switch panel.

The electronic siren shall be controlled on the siren head only. No horn button or foot switches shall be required.

SPEAKER

There shall be one (1) Whelen®, Model SA315P, black nylon composite, 100-watt, speaker with through bumper mounting brackets and polished stainless steel grille provided. The speaker shall be connected to the siren amplifier.

The speaker(s) shall be recessed in the center of the front bumper.

AUXILIARY MECHANICAL SIREN

There shall be a Federal Signal Model Q2B mechanical siren furnished and installed in the front of the apparatus.

The Q2B shall be chrome finish.

The siren shall have a 2-gauge cable connected to a power solenoid that is connected by a 2-gauge cable ran battery direct to the primary chassis batteries and shall be labeled Q2B+ at the battery. The power solenoid shall only be enabled when the emergency master switch is on.

The siren shall have a 2-gauge ground wire connected to the chassis battery stud. The cable shall be labeled Q2B- at the battery.

The mechanical siren shall be mounted on the bumper deckplate. It shall be mounted on the left side. The siren mounting shall include a reinforcement plate.

The mechanical siren shall be actuated by one (1) Linemaster foot switch located on the driver's side. There shall also be one (1) Linemaster foot switch in the officer's side floor. There shall be yellow covers installed as the cover for each switch.

A momentary chrome push button switch shall be included in the right side dash panel to activate the siren brake.

FRONT ZONE UPPER WARNING LIGHTS

There shall be one (1) 81.00" Whelen Freedom IV LED lightbar mounted on the cab roof.

The lightbar shall include the following:

- One (1) red flashing LED module in the driver's side end position.
- One (1) red flashing LED module in the driver's side front corner position.
- One (1) red flashing LED module in the driver's side first front position.
- One (1) red flashing LED module in the driver's side second front position.
- One (1) red flashing LED module in the driver's side third front position.
- One (1) red flashing LED module in the driver's side fourth front position.
- One (1) red flashing LED module in the driver's side fifth front position.
- One (1) red flashing LED module in the driver's side sixth front position.
- One (1) 795 LED traffic light controller set to national standard high priority in the center positions.
- One (1) red flashing LED module in the passenger's side sixth front position.
- One (1) red flashing LED module in the passenger's side fifth front position.
- One (1) red flashing LED module in the passenger's side fourth front position.
- One (1) red flashing LED module in the passenger's side third front position.
- One (1) red flashing LED module in the passenger's side second front position.
- One (1) red flashing LED module in the passenger's side first front position.
- One (1) red flashing LED module in the passenger's side front corner position.
- One (1) red flashing LED module in the passenger's side end position.

There shall be lenses that are the same color as the LEDs included on the lightbar.

The following switches may be installed in the cab on the switch panel to control the lightbar:

- a switch to control the flashing LED modules.
- the traffic light controller by a cab switch with emergency master control.
- no momentary switch to activate the traffic light controller.

The traffic light controller shall be disabled when the parking brake is applied.

The 12 red flashing LED modules in the front positions may be load managed when the parking brake is applied.

SIDE ZONE UPPER LIGHTS

There shall be two (2) Whelen, Model M6* LED flashing lights provided, one (1) each side of the crew cab. The lights shall be located in the raised roof section, Centered on RS and LS of cab, above the side compartments. of the crew cab doors. Each light shall be mounted with a Whelen, Model M6FC chrome flange.

The color of the lights shall be red LED/red lens.

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

FRONT ZONE LOWER LIGHTS

There shall be four (4) Whelen®, LED lights installed on the cab face above the headlights, in a common bezel matching the headlamp bezel per the following:

- One (1) Model M6**, 4.31" high x 6.75" long x 1.38" deep light installed in the outside position on the driver's side. The driver's side front outside warning light to be red.
- One (1) Model 6RB**, 4.18" high x 6.56" long x 3.43" deep light installed in the inside position on the driver's side. The driver's side front inside warning light to be white.
- One (1) Model 6RB**, 4.18" high x 6.56" long x 3.43" deep light installed in the inside position on the passenger's side. The passenger's side front inside warning light to be white.
- One (1) Model M6**, 4.31" high x 6.75" long x 1.38" deep light installed in the outside position on the passenger's side. The passenger's side front outside warning light to be red.

The lens colors shall be the same color as the LED's.

There shall be a switch located in the cab on the switch panel to control both sets of lights.

The inside lights may be load managed if colored or disabled if white when the parking brake is applied.

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 headlight (high or low beam) switch is activated or when the parking brake is set.

SIDE ZONE LOWER LIGHTING

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

- Two (2) Model M6V2**, 4.31" high x 6.75" long x 2.25" deep lights with a combination of warning LED's and scene LED's installed one (1) each side on the bumper extension. The side front lights to be red.
- Two (2) Model M6**, 4.31" high x 6.75" long x 1.38" deep lights with warning LED's installed one (1) each side above the front wheels. The side middle lights to be red.
- Two (2) Model M6V2**, 4.31" high x 6.75" long x 2.25" deep lights with a combination of warning LED's and scene LED's installed one (1) each side above rear wheels. The side rear lights to be red.

The warning LED lens color(s) to be the same as the LEDs.

There shall be a switch in the cab on the switch panel to control the flashing warning lights.

The scene LED's shall be activated when a directional signal is activated and the emergency master switch is on. The scene LED's may be load managed when the parking brake is applied.

SIDE WARNING LIGHTS

There shall be four (4) Whelen, Model M7* LED flashing warning light(s) with bezel(s) provided LS and RS upper of body. above LS1, LS3, RS1, RS3..

The color of the lights shall be red.

All of these lights shall include a lens color that is the same as the LED's

These lights shall be activated with the Side Zone Lower warning lights.

SIDE WARNING LIGHTS

There shall be four (4) Whelen®, Model I2SM#, 1.68" high x 6.00" wide x 1.12" deep flashing LED warning lights with clear lens(es) and chrome housing provided and located in the body rub rails centered under LS1, LS3, RS1, RS3.

The color of the LEDs to be red and amber.

The light(s) shall be activated with the side warning switch and with the emergency master

The white LEDs shall be deactivated when the parking brake is applied.

Amber, blue, and red LEDs may be load managed when the parking brake is applied.

REAR ZONE LOWER WARNING LIGHTS

There shall be two (2) Whelen®, Model M6**, 4.31" high x 6.75" wide x 1.37" deep flashing LED warning lights located in the rear tail light housings of the apparatus per the following:

- The driver's side rear light to be red.
- The passenger's side rear light to be red.
- The lens color(s) to be the same as the LEDs.

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

WARNING LIGHTS (REAR)

There shall be two (2) Whelen Model M7* LED flashing warning light(s) with bezel(s) provided LS upper rear, RS upper rear.

The color of these light(s) shall be red.

These light(s) shall be controlled with the rear upper warning switch.

These light(s) shall include a lens that is the same color as the LED's.

REAR/SIDE ZONE UPPER WARNING LIGHTS

There shall be two (2) Whelen®, Model L31H*FN, LED warning beacons provided at the rear of the truck, located one (1) each side. There shall be a switch located in the cab on the switch panel to control the beacons.

The color of the lights shall be red LEDs with both domes red.

Bidder
Complies
Yes No

The rear warning lights shall be mounted on polished stainless steel brackets with all wiring totally enclosed. These brackets shall also support the clearance/marker lights.

TRAFFIC DIRECTING LIGHT

There shall be one (1) Whelen®, Model TAL65, 36.00" long x 2.87" high x 2.25" deep, amber LED traffic directing light installed at the rear of the apparatus.

The Whelen, Model TACTL5, control head shall be included with this installation.

The controller shall be energized when the battery switch is on.

The auxiliary flash to be activated when the emergency master switch is on.

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.

120 VOLT RECEPTACLE

There shall be one (1), 15/20 amp 120 volt AC three (3) wire straight blade duplex receptacle(s) with interior stainless steel wall plate(s), installed LS1. The NEMA configuration for the receptacle(s) shall be 5-20R.

The receptacle(s) shall be powered from the shoreline inlet.

There shall be a label installed near the receptacle(s) that state the following:

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

120 VOLT RECEPTACLE

There shall be one (1), 15/20 amp 120 volt AC three (3) wire straight blade duplex receptacle(s) with interior stainless steel wall plate(s), installed RS1. The NEMA configuration for the receptacle(s) shall be 5-20R.

The receptacle(s) shall be powered from the shoreline inlet.

There shall be a label installed near the receptacle(s) that state the following:

Bidder Complies	
Yes	No

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

120 VOLT RECEPTACLE

There shall be one (1), 15/20 amp 120 volt AC three (3) wire straight blade duplex receptacle(s) with interior stainless steel wall plate(s), installed RS3. The NEMA configuration for the receptacle(s) shall be 5-20R.

The receptacle(s) shall be powered from the shoreline inlet.

There shall be a label installed near the receptacle(s) that state the following:

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

120 VOLT RECEPTACLE

There shall be one (1), 15/20 amp 120 volt AC three (3) wire straight blade duplex receptacle(s) with interior stainless steel wall plate(s), installed LS3. The NEMA configuration for the receptacle(s) shall be 5-20R.

The receptacle(s) shall be powered from the shoreline inlet.

There shall be a label installed near the receptacle(s) that state the following:

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

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

NFPA REQUIRED LOOSE EQUIPMENT PROVIDED BY FIRE DEPARTMENT

The following loose equipment as outlined in NFPA 1901, 2016 edition, section 5.9.3 and 5.9.4 shall be provided by the fire department.

- 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) smoothbore of combination nozzle with 2.50" shutoff that flows a minimum of 250 gpm.
- One (1) SCBA complying with NFPA 1981 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.
- Two (2) hydrant wrenches.
- One (1) double female 2.50" (65 mm) adapter with National Hose threads.
- One (1) double male 2.50" (65 mm) adapter with National Hose threads.
- One (1) rubber mallet, for use on suction hose connections.
- 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 (2) at the shoulders, two (2) at the sides, and one (1) 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) 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 (1) automatic external defibrillator (AED).
- 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).
- 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 PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, section 5.8.2.1 requires a minimum of 20' of suction hose or 15' of supply hose shall be carried.

Hose is not on the apparatus as manufactured. The fire department shall provide suction or supply hose.

STRAINER PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, section 5.8.2.1.1 requires a suction strainer when suction hose is provided.

The strainer is not on the apparatus as manufactured. The fire department shall provide the suction strainer.

DRY CHEMICAL EXTINGUISHER PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, section 5.9.4 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, 2016 edition, section 5.9.4 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, 2016 edition, Section 5.9.4 requires one (1) flathead axe mounted in a bracket fastened to the apparatus.

Bidder Complies	
Yes	No

The axe is not on the apparatus as manufactured. The fire department shall provide and mount the axe.

PICKHEAD AXE PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, Section 5.9.4 requires one (1) pickhead 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.

PAINT PROCESS

The exterior custom cab and body painting procedure shall consist of a seven (7) step finishing process as follows:

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.
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.
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.
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.
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.
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.
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

Bidder Complies	
Yes	No

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 manufacturer.

After the cab and body are painted, the color shall be verified to make sure that it matches the color standard. Electronic color measuring equipment shall be used to compare the color sample to the color standard entered into the computer. Color specifications shall be used to determine the color match. A Delta E reading shall be used to determine a good color match within each family color.

All removable items such as brackets, compartment doors, door hinges, and trim shall be removed and painted 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 paint finish quality levels for critical areas of the apparatus (cab front and sides, body sides and doors, and boom lettering panels) are to meet or exceed Cadillac/General Motors GMW15777 global paint requirements. Orange peel levels are to meet or exceed the #6 A.C.T. standard in critical areas. These requirements must be met in order for the exterior paint finish to be considered acceptable. The manufacture's written paint standards shall be available upon request.

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 percent 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 percent. Water wash systems shall be 99.97 percent 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 recycled 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

Bidder Complies	
Yes	No

manufacturing facility meets the above conditions and that it is in compliance with his state EPA rules and regulations.

CAB PAINT

The cab shall be painted #90 red.

BODY PAINT

The body shall be painted to match the lower section of the cab.

PAINT CHASSIS FRAME ASSEMBLY

The chassis frame assembly shall be finished with a single system black top coat 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 treated with epoxy E-coat protection prior to paint:

- Two (2) C-channel frame rails

Components that are included with the chassis frame assembly that shall be painted not e-coated are:

- Cross members
- Axles
- 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
- Steel fuel tank
- Castings
- Individual piece parts used in chassis and body assembly

The E-coat process shall meet the technical properties shown.

AXLE HUB PAINT

All axle hubs shall be painted to match primary job color.

Bidder
Complies
Yes No

COMPARTMENT INTERIOR PAINT

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

REFLECTIVE BAND

Reflective stripes shall be provided across the front of the vehicle and along the sides of the body. The reflective band shall consist of a 6.00" black stripe at the top 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.

REAR CHEVRON STRIPING

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

The colors may be red and fluorescent yellow green diamond grade or may be red and black diamond grade if allowed by NFPA at the time of the build. This will be discussed and determined as part of the prebuild meeting.

Each stripe shall be 6.00" in width.

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

"Z" JOG IN REFLECTIVE STRIPE

There shall be one (1) "Z"-shaped jog(s) provided in the reflective stripe design.

CAB DOOR REFLECTIVE STRIPE

A 6.00" x 16.00" ruby red 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.

LETTERING

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

Bidder
Complies
Yes No

LETTERING

One (1) to twenty (20) genuine gold leaf lettering, 2.00" high, with outline and shade shall be provided.

LETTERING

Forty-one (41) to sixty (60) reflective lettering, 6.00" high, with outline and shade shall be provided.

DECAL INSTALLATION

There shall be two (2) decal/s furnished by the fire department and applied by the apparatus manufacturer.

All Decal, lettering and striping location, colors and style shall be discussed and finalized during the preconstruction meeting.

FIRE APPARATUS PARTS MANUAL

There shall be one (1) custom parts manual(s) in USB flash drive format for the complete fire apparatus provided.

The manual(s) 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

Each manual 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 MANUALS

There shall be one (1) chassis service manuals on USB flash drives 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
- 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 MANUAL

The chassis operation manual shall be provided on one (1) USB flash drive.

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

Bidder Complies	
Yes	No

STEERING GEAR WARRANTY

A TRW **one (1) 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 and crossmembers shall be provided with a fifty (50) year material and workmanship limited warranty. The warranty shall cover the chassis frame and crossmembers 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 FIVE (5) YEAR MATERIAL AND WORKMANSHIP WARRANTY

A Meritor™ Axle 5 year limited warranty shall be provided.

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

A Meritor™ Axle 5 year limited warranty shall be provided.

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

A Meritor Wabco™ ABS brake system **three (3) year** 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 PRO-RATED PAINT AND CORROSION

Each new piece of apparatus shall be provided with a **ten (10) year** pro-rated 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).

Bidder Complies	
Yes	No

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).

COMPARTMENT LIGHT WARRANTY

A ten (10) year material and workmanship limited warranty shall be provided for the manufacturers 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 Allison Transmission and not the apparatus builder.

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 UPF 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).

TEN (10) YEAR STRUCTURAL INTEGRITY

Each new piece of apparatus shall be provided with a **ten (10) 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).

Bidder Complies	
Yes	No

ROLLUP DOOR MATERIAL AND WORKMANSHIP WARRANTY

A R-O-M Corporation rollup door limited warranty shall be provided. The mechanical components of the rollup door shall be warranted against defects in material and workmanship for a period of seven (7) years. The door ajar switch shall be warranted for a period of three (3) years and all other electrical components shall be warranted for a period of one (1) year. A seven (7) year limited warranty shall be provided on painted rollup doors.

A copy of the warranty certificate shall be submitted with the bid package.

PUMP WARRANTY

The Waterous pump shall be provided with a Seven (7) 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).

TEN (10) YEAR PRO-RATED PAINT AND CORROSION

Each new piece of apparatus shall be provided with a **ten (10) year** pro-rated 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).

Bidder Complies	
Yes	No

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 delivery.

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 a cab crash test certification with this proposal. The certification shall state that a specimen representing the substantial structural configuration of the cab has been tested and certified by an independent third party test facility. Testing events shall be documented with photographs, real-time and high-speed video, vehicle accelerometers, cart accelerometers, and a laser speed trap. The fire apparatus manufacturer shall provide a state licensed professional engineer to witness and certify all testing events. Testing shall meet or exceed the requirements below:

- SAE J2422 Cab Roof Strength Evaluation - Quasi-Static Loading Heavy Trucks.
- European Occupant Protection Standard ECE Regulation No.29.
- SAE J2420 COE Frontal Strength Evaluation - Dynamic Loading Heavy Trucks.

Side Impact

The cab shall be subjected to dynamic preload where a 14,320-lb moving barrier is slammed into the side of the cab at 5.50 mph, striking with an impact of 13,000 ft-lb of force. This test is part of the SAE J2422 test procedure and more closely represents the forces a cab shall see in a rollover incident.

Frontal Impact

The same cab shall withstand a frontal impact of 32,600 ft-lb of force using a moving barrier in accordance with SAE J2420.

Bidder Complies	
Yes	No

Additional Frontal Impact

The same cab shall withstand a frontal impact of 65,098 ft-lb of force using a moving barrier. (Twice the force required by SAE J2420)

Roof Crush

The cab shall be subjected to a roof crush force of 22,500 lb. This value meets the ECE 29 criteria, and is equivalent to the front axle rating up to a maximum of ten (10) metric tons.

Additional Roof Crush

The same cab shall be subjected to a roof crush force of 110,000 lbs. (Four and a half times the load criteria of ECE 29)

The same cab shall withstand all tests without any measurable intrusion into the survival space of the occupant area.

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.

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.

Bidder Complies	
Yes	No

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, at time of delivery, that each seat mount and cab structure design was pull tested to the required force and met the appropriate criteria.

PERFORMANCE CERTIFICATIONS

Cab Air Conditioning

Good cab air conditioning temperature and air flow performance keeps occupants comfortable, reduces humidity, and provides a climate for recuperation while at the scene. The cab air conditioning system shall cool the cab from a heat-soaked condition at 100 degrees Fahrenheit to an average of 78 degrees Fahrenheit in 30 minutes. The bidder shall certify that a substantially similar cab has been tested and has met these criteria.

Cab Defroster

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 Auxiliary Heater

Good cab heat performance and regulation provides a more effective working environment for personnel, whether in-transit, or at a scene. An auxiliary cab heater 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, at time of delivery, 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:
 - The nameplate rating of the alternator.
 - The alternator rating under the conditions specified per:

Bidder Complies	
Yes	No

- 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).