	Bidder Complies	
	Yes	No

SPECIFICATIONS FOR A TOP MOUNT CUSTOM PUMPER

Sealed bids will be received by City of Spartanburg Fire Department 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

The purchaser's standards for bidding automotive fire apparatus must be strictly adhered to, and all bid forms and questions must be complete and submitted with the bid. **Omissions and variations shall result in immediate rejection of the bid.**

Bids shall only be considered from companies that have an established reputation in the field of fire apparatus construction and have been in business for a minimum of 20 years. Furthermore, in order 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 brands 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.

Any apparatus manufacturer or their parent company will certify that no bonds were called in over the period of the last ten (10) years.

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

	Bidder Complies	
	Yes	No
the apparatus furnished under contract shall conform. These specifications shall indicate size, type, model and make of all components parts and equipment, providing proof of compliance with each and every item in the departments advertised specifications. A letter only, even though written on 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 photo copies and submits these specifications as their own construction details will be considered non responsive. 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. Bids shall include a pre-payment schedule that clearly defines the reduction of bid price at pre-payments of one hundred percent (100%), seventy-five percent (75%), fifty percent (50%), twenty-five percent (25%), and ten percent (10%). 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 as a result 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. Bidders shall indicate in the "yes/no" column if their bid complies on 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.		

	Bidder Complies	
	Yes	No
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. Bids not including all exceptions is a material breach and shall result in the bid being immediately rejected. **GENERAL DESIGN AND CONSTRUCTION** The cab, chassis, pump module, and body are to be entirely designed, assembled and painted by the prime vehicle manufacturer, which minimizes third party involvement on engineering, design, service and warranty issues. 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. Apparatus using any subcontracted cab, chassis, pump module, electrical system or body will not be acceptable. 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		

	Bidder Complies	
	Yes	No

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 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 ten (10) fire departments/municipalities in the region that have bought a second time from the representing dealer.

DELIVERY

Apparatus, to insure proper break in of all components while still under warranty, **shall be delivered under its own power** - rail or truck freight shall not be acceptable. A qualified delivery 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.

SAFETY VIDEO

Since video is much more effective than written documentation and can be replayed for new personnel and as a refresher for existing personnel, an apparatus safety video, in DVD format shall be provided at time of delivery. This video shall address key safety considerations for personnel to follow when they are driving, operating, and maintaining the apparatus. Safety procedures for the following shall be included on the video: vehicle pre trip inspection, chassis operation, pump operation and maintenance.

PERFORMANCE TESTS AND REQUIREMENTS

A road test shall be conducted with the apparatus fully loaded and a continuous run of ten (10) miles or more shall be made under all driving conditions, during which time the apparatus shall show no loss of power or overheating. The transmission drive shaft or shafts, and rear 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:

	Bidder Complies	
	Yes	No
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). **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 INSURE 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 in position 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 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 fifty (150) miles of the Fire Department.		

	Bidder Complies	
	Yes	No

SERVICE AND WARRANTY SUPPORT (MANUFACTURER)

The manufacturer shall stock an inventory 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 upon request.

Parts identification shall be provided to both the dealer and the Fire Department through an on line 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.

The manufacturer must also maintain a 24 hour/ 7 day a week, toll free emergency hot line.

The manufacturer shall employ a staff of adequate size specifically dedicated to providing customer support and parts for the fielded fleet of vehicles it has produced.

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.

The manufacturer shall employ certified EVT technicians on staff, not only providing technical expertise in the repair of fire apparatus, but also demonstrating the commitment to service after the sale.

LIABILITY

The successful bidder shall defend any and all suits and assume all liability for the use of any patented process including any device or article forming a part of the apparatus or any appliance furnished under the contract. To ensure this will occur, the bidder shall carry the following minimum insurance.

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$2,000,000

Personal and Advertising Injury$1,000,000

	Bidder Complies	
	Yes	No

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 Owner as an additional insured.

COMMERCIAL AUTOMOBILE LIABILITY INSURANCE

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

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

Coverage shall be written on a Commercial Automobile liability form.

UMBRELLA/EXCESS LIABILITY INSURANCE

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

Aggregate:$25,000,000

Each Occurrence: $25,000,000

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

The required limits can be provided by one (1) or more policies provided all other insurance requirements are met.

Coverage shall be provided by a carrier(s) rated A- or better by A.M. Bests.

All policies shall provide a 30 day notice of cancellation to the named insured. The Certificate of Insurance shall provide the following cancellation clause: Should any of the above described polices be cancelled before the expiration date thereof, notice shall be delivered in accordance with the policy provisions. Bidder agrees to furnish owner with a current Certificate of Insurance with the coverages listed above along with its bid. The certificate shall show the purchaser as certificate holder.

SINGLE SOURCE MANUFACTURER

Bids shall only be accepted from a single source apparatus manufacturer. The definition of single source is a manufacturer that designs and manufactures their products using an integrated approach, including the chassis, cab weldment, cab, pumphouse (including the sheet metal

	Bidder Complies	
	Yes	No

enclosure, valve controls, piping and operators panel) and body being designed, fabricated and assembled on the bidder's premises. The electrical system (hardwire or multiplex) shall be both designed and integrated by the same apparatus manufacturer. The warranties relative to these major components (excluding component warranties such as engine, transmission, axles, pump, etc.) must be from a single source manufacturer and not split between manufacturers (i.e. body, pumphouse, cab weldment and chassis). The bidder shall provide evidence that they comply with this requirement.

The bidder shall state the location of the factory where the apparatus is to be built.

NFPA 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.

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".

	Bidder Complies	
	Yes	No

VEHICLE INSPECTION PROGRAM CERTIFICATION

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

A placard shall be affixed in the driver's side area stating the third party agency, the date, the standard and the certificate number of the whole vehicle audit.

PUMP TEST

The pump shall be tested, approved, and certified 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.

GENERATOR TEST

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

AFTERMARKET SUPPORT WEBSITE

A Customer Service website shall provide authorized dealers access to comprehensive information pertaining to the maintenance and service of their customer's apparatus. This tool shall provide the authorized dealer the ability to service and support their customers to the best of their ability with factory support at their fingertips.

This website shall also be accessible to the end user through the guest login. Limited access is available and vehicle specific parts information accessible by entering a specific VIN number. All end users should see their local authorized dealer for additional support and service.

The website shall provide the following to the designated individuals:

- Authorized dealer only - ability to access truck detail information on the major components of the vehicle, warranty information, available vehicle photographs, vehicle drawings, sales options, applicable vehicle software downloads, etc.

- Authorized dealer and customer - parts look-up capability, with the aid of digital photographs, part drawings, and assembly drawings.

- Authorized dealer only - ability to electronically submit warranty claims directly to the factory for reimbursement.

	Bidder Complies	
	Yes	No

- Authorized dealer only - accessibility to multiple dealer reports that allow the dealership to maintain communication with the customer on the status of orders, claims, and phone contacts.

- Authorized dealer and customer - access to all currently published Operation and Maintenance and Service publications.

- Authorized dealer only - access to manufacturer Service Bulletins and Work Instructions containing information on current service topics and recommendations provided.

- Authorized dealer and customer - access to upcoming training classes offered by the manufacturer.

- Authorized dealer only - access to interactive electronic learning modules (Operators Guides) covering the operation of major vehicle components.

- Authorized dealer only - access to customer service articles, corporate news, quarterly newsletters, and key contacts.

BID BOND

All bidders shall provide a bid bond as security for the bid in the form of a 5% 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 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.

	Bidder Complies	
	Yes	No
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.		
CUSTOMER REFERENCE LIST A customer reference list shall be provided with each bid. The reference list shall include a minimum of twenty five (25) Departments who currently operate the brand of apparatus being bid. Reference information shall include but not limited to Department name, contact information and make/model of apparatus in service.		
LOCAL SERVICE FACILITY Each bidder must provide with bid proof of dealer authorized Service Facility located within one hundred fifty (150) miles of department, along with factory trained service personnel. Service personnel shall be factory trained to handle parts and warranty repair for their respective manufacturer. In addition, local Service Facility must have the capability to dispatch factory trained service technicians with dealer operated mobile service units to Department location for field service repairs.		
PRE-CONSTRUCTION CONFERENCE A pre-construction conference shall be held at the manufacturer's facility to review approval drawing package. Motel, meals and travel (commercial airlines) expenses for four (4) Department personnel shall be the responsibility of the successful bidder. The sales representative for this project shall be present and assist in the conference.		
CONSTRUCTION PROGRESS PHOTOS The successful bidder shall provide weekly photographs of the apparatus or the major components as they are being constructed. The photos shall commence at the beginning of the manufacturing process and shall continue until just prior to the final inspection. There shall be approximately six (6) weekly reports illustrating the progress of the apparatus through the course of each week. Special attention shall be given to show the unique features and aspects of the apparatus as construction progresses.		
FINAL INSPECTION		

	Bidder Complies	
	Yes	No

A final inspection shall be provided at the manufacturer's facility for inspection of the completed unit. Motel, meals and travel (commercial airlines) expenses for four (4) Department personnel shall be the responsibility of the successful bidder. The sales representative shall be present and assist in the inspection process.

DELIVERY

Following final inspection at the manufacturing facility the Apparatus, to insure proper break in of all components while still under warranty, **shall be delivered under its own power to local Dealership**. Dealership shall perform a full Pre-Delivery Inspection of the Apparatus by manufacturer's certified technicians. This shall include an inspection of all components of the Apparatus and if any inoperable components are detected they shall be repaired before delivery to Department.

ORIENTATION TRAINING

There shall be one (1) class held at the Fire Department by a factory certified trainer. The class shall consist of basic orientation of the apparatus and shall last approximately 3 hours. The class shall cover basic operations of cab, chassis, pump and body components that are included on the new apparatus.

THIS IS IN ADDITION TO FACTORY FOAM SYSTEM AND/OR AERIAL OPERATION IF APPLICABLE.

CONTINGENCY FUND

A CONTINGENCY FUND OF $2,000.00 FOR CHANGE ORDERS SHALL BE INCLUDED.

APPROVAL DRAWING

A drawing of the proposed apparatus shall be provided for approval before construction begins. The sales representative shall also have a copy of the same drawing. The finalized and approved drawing shall become part of the contract documents. This drawing shall indicate the chassis make and model, location of the lights, siren, horns, compartments, major components, etc.

A "revised" approval drawing of the apparatus shall be prepared and submitted by the manufacturer to the purchaser showing any changes made to the approval drawing.

ELECTRICAL WIRING DIAGRAMS

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

	Bidder Complies	
	Yes	No

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 122".

WHEELBASE

The wheelbase of the vehicle shall be no greater than 229.50".

GVW RATING

The gross vehicle weight rating shall be a minimum of 47000#.

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 an rbm of 2,275,200 in-lb over the rear axle.

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

FRAME REINFORCEMENT

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

The frame liner shall be mounted inside of the chassis frame rail and extend the full length of the frame.

FRONT NON DRIVE AXLE

The front axle shall be of the independent suspension design with a ground rating of 20,000 pounds.

	Bidder Complies	
	Yes	No
Upper and lower control arms shall be used on each side of the axle. Upper control arm castings shall be made of 100,000-psi yield strength 8630 steel and the lower control arm casting shall be made of 55,000-psi yield ductile iron. The center cross members and side plates shall be constructed out of 80,000-psi yield strength steel. Each control arm shall be mounted to the center section using elastomer bushings. These rubber bushings shall rotate on low friction plain bearings and be lubricated for life. Each bushing shall also have a flange end to absorb longitudinal impact loads, reducing noise and vibrations. There shall be nine (9) grease fittings supplied, one (1) on each control arm pivot and one (1) on the steering gear extension. The upper control arm shall be shorter than the lower arm so that wheel end geometry provides positive camber when deflected below rated load and negative camber above rated load. Camber at load shall be zero degrees for optimum tire life. The ball joint bearing shall be of low friction design and be maintenance free. Toe links that are adjustable for alignment of the wheel to the center of the chassis shall be provided. The wheel ends must have little to no bump steer when the chassis encounters a hole or obstacle. The steering linkage shall provide proper steering angles for the inside and outside wheel, based on the vehicle wheelbase. The axle shall have a third party certified turning angle of 45 degrees. Front discharge, front suction, or aluminum wheels shall not infringe on this cramp angle. **FRONT SUSPENSION** Front independent suspension shall be provided with a minimum ground rating of 22,800 lb. The independent suspension system shall be designed to provide maximum ride comfort. The design shall allow the vehicle to travel at highway speeds over improved road surfaces and at moderate speeds over rough terrain with minimal transfer of road shock and vibration to the vehicle's crew compartment. Each wheel shall have torsion bar type spring. In addition, each front wheel end shall also have energy absorbing jounce bumpers to prevent bottoming of the suspension.		

	Bidder Complies	
	Yes	No
The suspension design shall be such that there is at least 10.00" of total wheel travel and a minimum of 3.75" before suspension bottoms. The torsion bar anchor lock system allows for simple lean adjustments, without the use of shims. One can adjust for a lean within 15 minutes per side. Anchor adjustment design is such that it allows for ride height adjustment on each side. The independent suspension shall be put through a durability test that has simulated a minimum of 140,000 miles of inner city driving. **FRONT SHOCK ABSORBERS** KONI heavy-duty telescoping shock absorbers shall be provided on the front suspension. **FRONT OIL SEALS** Oil seals with viewing window shall be provided on the front axle. **FRONT TIRES** The front tires shall be Michelin 385/65R22.50 radials, load range L, XFE wide base tread, rated for 20,000 lb maximum axle load and 65 mph maximum speed. The tires shall be mounted on 22.50" x 12.25" steel disc type wheels with a ten (10)-stud, 11.25" bolt circle. **REAR AXLE** The rear axle shall be a Meritor™, Model RS-26-185, with a capacity of 27,000 lb. **TOP SPEED OF VEHICLE** A rear axle ratio shall be furnished to allow the vehicle to reach a top speed of 65 MPH. **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. 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).		

	Bidder Complies	
	Yes	No

REAR TIRES

Rear tires shall be four (4) Michelin 12R22.50 radials, 16 ply all season XDN2 tread, rated for 27,120 lb maximum axle load and 75 mph maximum speed.

The tires shall be mounted on 22.50" x 8.25" steel disc type 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 VECSAFE LED tire alert pressure management system provided that shall monitor each tire's pressure. A chrome plated brass sensor shall be provided on the valve stem of each tire for a total of six (6) tires.

The sensor shall calibrate to the tire pressure when installed on the valve stem for pressures between 20 and 120 psi. The sensor shall activate an integral battery operated LED when the pressure of that tire drops 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 blinking.

FRONT HUB COVERS

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

REAR HUB COVERS

A pair of stainless steel high hat hub covers shall be provided on rear axle hubs.

CHROME LUG NUT COVERS

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

MUD FLAPS

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

WHEEL CHOCKS

There shall be one (1) pair of Ziamatic AC-44, aluminum alloy wheel blocks 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

	Bidder Complies	
	Yes	No
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 lockup, a signal shall be sent to the control unit. This control unit shall then reduce the braking of that wheel for a fraction of a second and then reapply the brake. This anti-lock brake system shall eliminate the lockup of any wheel thus helping to prevent the apparatus from skidding out of control. **BRAKES** The service brake system shall be full air type. The front brakes shall be Knorr/Bendix disc type with a 17.00" ventilated rotor for improved stopping distance. The brake system shall be certified, third party inspected, for improved stopping distance. The rear brakes shall be Meritor™ 16.50" x 7.00" cam operated with automatic slack adjusters. Dust shields shall be provided. **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: • Bendix® dual brake treadle valve with vinyl covered foot surface • Heated automatic moisture ejector on air dryer • Total air system capacity of 4,362 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		

	Bidder Complies	
	Yes	No

- 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)

The air tank shall be primed and painted to meet a minimum 750 hour salt spray test.

To reduce the effects of corrosion, the air tank shall be mounted with stainless steel brackets (no exception).

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.

COMPRESSION FITTINGS ONLY

Any nylon hose on the apparatus that is pneumatic shall be plumbed with compression type fittings where applicable. Push lock fittings shall not be acceptable for any pneumatic nylon hose plumbing.

ENGINE

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

Make:	Cummins
Model:	ISL9
Power:	450 hp at 2100 rpm
Torque:	1250 lb-ft at 1400 rpm
Governed Speed:	2200 rpm
Emissions Level:	EPA 2016
Fuel:	Diesel
Cylinders:	Six (6)
Displacement:	543 cubic inches (8.9L)
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

	Bidder Complies	
	Yes	No
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." **DRIVELINE RETARDER** A Telma focal mounted driveline retarder shall be provided on the front of the differential. The retarder shall be the electro-magnetic type, automatically actuated with application of the brake pedal. Cab dash mounted indicator lights shall be provided to show retarder activation stages applied. The Telma retarder model, that is suitable for the application, based on vehicle weight and axle ratio, shall be provided. The ABS system shall automatically disengage the auxiliary braking device, when required. **CLUTCH FAN** A fan clutch shall be provided. The fan clutch shall be automatic when the pump transmission is in "Road" position, and fully engaged in "Pump" position. **ENGINE AIR INTAKE** An air intake with an ember separator (to prevent road dirt, burning embers, and recirculating hot air from entering the engine) shall be mounted at the front of the apparatus, on the passenger side of the engine. The ember separator shall be mounted in the air intake with flame retardant, roto-molded polyethylene housing. It shall be easily accessible by the hinged access panel at the front of the vehicle. **EXHAUST SYSTEM** The exhaust system shall be stainless steel from the turbo to the inlet of the selective catalytic reduction (SCR) device, and shall be 4.00" in diameter. The exhaust system shall include a diesel particulate filter (DPF) and an SCR device to meet current EPA standards. An insulation wrap shall be provided on all exhaust pipes between the turbo and DPF to minimize the transfer of heat to the cab. The exhaust shall terminate horizontally ahead of the right side rear wheels.		

	Bidder Complies	
	Yes	No

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.

EXHAUST MODIFICATION

The exhaust pipe shall be brought out from under the body at a 90 degree angle from the truck. The tail pipe shall extend a minimum of 2.00" past the body, adaptable for the Plymovent system. The diameter of the pipe shall be 6.00". There shall be a clearance of 4.00" completely around the pipe once past the side of the body. A stop shall be provided on the tail pipe that shall prevent the nozzle from sliding too far on.

EXHAUST MODIFICATION

A Plymovent® Magnetic Grabber conical shaped adapter shall be provided on the end of the tailpipe.

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 core shall be made of aluminum fins, having a serpentine design, brazed to aluminum tubes. The tubes shall be brazed to aluminum headers. No solder joints or leaded material of any kind shall be acceptable in the core assembly. The radiator core shall have a minimum frontal area of 1434 square inches. Supply and return tanks made of glass-reinforced nylon shall be crimped on to the core assembly using header tabs and a compression gasket to complete the radiator core assembly. The radiator shall be compatible with commercial antifreeze solutions.

There shall be a full steel frame around the entire radiator core assembly. The radiator core assembly shall be isolated within the steel frame by rubber inserts to enhance cooling system durability and reliability. The radiator shall be mounted in such a manner as to prevent the development of leaks caused by twisting or straining when the apparatus operates over uneven ground. The radiator assembly shall be isolated from the chassis frame rails with rubber isolators.

The radiator assembly shall include an integral deaeration tank permanently mounted to the top of the radiator framework, with a readily accessible remote-mounted overflow tank. For visual coolant level inspection, the radiator shall have a built-in sight glass. The radiator shall be equipped with a 15 psi pressure relief cap.

	Bidder Complies	
	Yes	No

A drain port shall be located at the lowest point of the cooling system and/or the bottom of the radiator to permit complete flushing of the coolant from the system.

A heavy-duty fan shall draw in fresh, cool air through the radiator. Shields or baffles shall be provided to prevent recirculation of hot air to the inlet side of the radiator.

COOLANT LINES

Gates, or Goodyear, 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 (no exception).

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.

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 manufacturers requirement for 10 percent expansion space in the event of tank freezing.

	Bidder Complies	
	Yes	No

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

FUEL SHUTOFF

A fuel line shutoff valve shall be installed on both the inlet and outlet of the primary fuel filter.

TRANSMISSION

An Allison 5th generation, Model EVS 3000P, electronic torque converting automatic transmission shall be provided.

The transmission shall be equipped with prognostics to monitor oil life, filter life, and transmission health. A wrench icon on the shift selector's digital display shall indicate when service is due.

Two (2) PTO openings shall be located on both sides of converter housing (positions 4 o'clock and 8 o'clock) as viewed from the rear.

A transmission temperature gauge with red light and audible alarm shall be installed on the cab dash.

TRANSMISSION SHIFTER

A five (5)-speed push button shift module shall be mounted to right of driver on console. Shift position indicator shall be indirectly lit for after dark operation.

The transmission ratio shall be:

1st	3.49 to 1.00
2nd	1.86 to 1.00
3rd	1.41 to 1.00
4th	1.00 to 1.00
5th	0.75 to 1.00
R	5.03 to 1.00

TRANSMISSION COOLER

A plate and fin transmission oil cooler shall be provided using engine coolant to control the transmission oil temperature.

MASTER ON/OFF SWITCH

A master on/off switch shall be provided in the cab instrument panel for controlling the Telma retarder.

	Bidder Complies	
	Yes	No

DRIVELINE

Drivelines shall be a heavy-duty metal tube and be equipped with Spicer® 1710 universal joints.

The shafts shall be dynamically balanced before installation.

A splined slip joint shall be provided in each driveshaft, slip joint shall be coated with Glidecoat® or equivalent.

STEERING

Dual Sheppard, Model M110, steering gears, with integral heavy-duty power steering, shall be provided. For reduced system temperatures, the power steering shall incorporate an air to oil cooler and an Eaton, Model VN20, 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.

BUMPER

A one (1) piece bumper manufactured from 0.25" formed steel with a 0.38" bend radius shall be provided. The bumper shall be a minimum of 10.00" high with a 1.50" top and bottom flange, and shall extend 22.00" from the face of the cab. The bumper shall be 102.00" wide with 45 degree corners and side plates. The bumper shall be metal finished and painted BLACK .

To provide adequate support strength, the bumper shall be mounted directly to the front of the C channel frame. The frame shall be a bolted modular extension frame constructed of 50,000 psi tensile steel.

GRAVEL PAN

A gravel pan, constructed of bright aluminum treadplate, shall be furnished between the bumper and the cab face. The pan shall be properly supported from the underside to prevent flexing and vibration.

Documentation shall be provided, upon request, to show that the options selected have been engineered for fit-up and approval for this modular bumper extension. A chart shall be provided to indicate the option locations and shall include, but not be limited to, the following options: air horns, mechanical sirens, speakers, hose trays (with hose capacities), winches, lights, discharge and suction connections.

	Bidder Complies	
	Yes	No

CENTER HOSE TRAY

A hose tray, constructed of aluminum, shall be placed in the center of the bumper extension.

The tray shall have a capacity of 150' of 1.75" double jacket cotton-polyester hose.

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

CENTER HOSE TRAY COVER

A bright aluminum treadplate cover shall be provided over the center hose tray.

The cover shall be "notched" allowing the hose to be pre connected to hose connection.

The cover shall be attached with a stainless steel hinge.

A D-ring latch shall secure the cover in the closed position and a mechanical stay arm shall hold the cover in the open position.

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 HOOKS

Two (2) chromed steel tow hooks shall be installed under the bumper and attached to the front frame members. The tow hooks shall be designed and positioned to allow up to a 6,000 lb straight horizontal pull in line with the centerline of the vehicle. The tow hooks shall not be used for lifting of the apparatus.

BUMPER SCUFFPLATE

The top edge of the painted bumper shall be wrapped with bright aluminum treadplate. The scuffplate shall protect the top edge of the bumper and shall wrap over the front of the bumper approximately .50".

CAB

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

To provide quality at the source and single source customer support, the cab shall be built by the apparatus manufacturer in a facility located on the manufacturer's premises (no exception).

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

	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 0.25" heavy wall extrusions joined by a solid A356-T6 aluminum joint casting. The B-pillar and C-pillar shall also be constructed from 0.25" heavy wall extrusions. The rear wall shall be constructed of two (2) 4.00" x 2.00" outer aluminum extrusions and two (2) 3.00" x 2.00" inner aluminum extrusions. All main vertical structural members shall run from the floor to 7.50" x 3.50" x 0.125" thick roof extrusions to provide a cage-like structure with the A-pillar and roof extrusions being welded into a 0.75" thick corner casting at each of the front corners of the roof assembly. The front of the cab shall be constructed of a 0.25" thick firewall, covered with a 0.125" front skin (for a total thickness of 0.38"), and reinforced with 24.50" wide x 10.00" deep x 0.50" thick supports on each side of the engine tunnel. The cross-cab support shall be welded to the A-pillar, 0.25" firewall, and engine tunnel, on the left and right sides. The cab floors shall be constructed of 0.1875" thick aluminum plate and reinforced at the firewall with an additional 0.25" thick cross-floor support providing a total thickness of 0.44" of structural material at the front floor area. The front floor area shall also be supported with three (3) 0.50" plates bolted together that also provides the mounting point for the cab lift. This tubing shall run from the front of the cab to the 0.1875" thick engine tunnel, creating the structure to support the forces created when lifting the cab. The cab shall be a full-tilt style. A three (3)-point cab mount system with rubber isolators shall improve ride quality by isolating chassis vibrations from the cab. 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 forward cab section shall have an overall height (from the cab roof to the ground) of approximately 102.00". The crew cab section shall have a 10.00" raised roof, with an overall cab height of approximately 112.00". The overall height listed shall be calculated based on a truck configuration with the lowest suspension weight ratings, the smallest diameter tires for the suspension, no water weight, no loose equipment weight, and no personnel weight. Larger tires, wheels, and suspension shall increase the overall height listed. The cab shall have an interior width of not less than 93.50". The driver and passenger seating positions shall have a minimum 24.00" clear width at knee level. To reduce injuries to occupants in the seated positions, proper head clearance shall be provided. The floor-to-ceiling height inside the forward cab shall be no less than 60.25". The floor-to-		

	Bidder Complies	
	Yes	No

ceiling height inside the crew cab shall be no less than 62.95" in the center position and 68.75" in the outboard positions.

The crew cab shall measure a minimum of 57.50" from the rear wall to the backside of the engine tunnel (knee level) for optimal occupant legroom.

INTERIOR CAB INSULATION

The cab walls, ceiling and engine tunnel shall be insulated in all strategic locations to maximize acoustic absorption and thermal insulation. The cab shall be insulated with 2.00" insulation in the rear wall, 3.00" insulation in the side walls, and 1.50" insulation in the ceiling.

FENDER LINERS

Full-circular, aluminum, inner fender liners in the wheel wells shall be provided.

PANORAMIC WINDSHIELD

A one (1)-piece, safety glass windshield with more than 2,802 square inches of clear viewing area shall be provided. The windshield shall be full width and shall provide the occupants with a panoramic view. The windshield shall consist of three (3) layers: the outer light, the middle safety laminate, and the inner light. The .114" thick 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

Three (3) electric windshield wipers with a washer, in conformance with FMVSS and SAE requirements, shall be provided. The wiper blades shall be 21.65" long and together shall clear a minimum of 1,783 square inches of the windshield for maximum visibility in inclement weather.

The windshield washer fluid reservoir shall be located at the front of the vehicle and be accessible through the access hood for simple maintenance.

FAST SERVICE ACCESS FRONT TILT HOOD

A full-width access hood shall be provided for convenient access to engine coolant, steering fluid, wiper fluid, cab lift controls, headlight power modules, and ember separator. The hood shall also provide complete access to the windshield wiper motor and components. The hood shall be contoured to provide a sleek, automotive appearance. The hood shall include air cylinders to hold the hood in open and closed positions, and a heavy duty latch system that shall meet FMVSS 113 (Hood Latch System). The spring-loaded hood latch shall be located at the center of the hood with a double-action release lever located behind the upper grill. The two (2)-

	Bidder Complies	
	Yes	No

step release requires the lever first be pulled to the driver side until the hood releases from the first latch (primary latch) then to the passenger side to fully release the hood (secondary latch).

ENGINE TUNNEL

To provide structural strength, the engine tunnel sidewalls shall be constructed of .50" aluminum plate that is welded to both the .25" firewall and .38" heavy wall extrusion under the crew cab floor. To maximize occupant space, the top edges shall be tapered.

The engine tunnel shall be insulated on both sides for thermal and acoustic absorption. The underside of the tunnel shall be covered with 1.00" thick polyether foam that is reinforced with an aluminized face. Thermal rating for this insulation shall be -40 degrees Fahrenheit to 300 degrees Fahrenheit. The insulation shall keep noise (dBA) levels at or lower than the specifications in the current edition of the NFPA 1901 standards.

CAB REAR WALL EXTERIOR COVERING

The entire exterior surface of the rear wall of the cab shall be overlaid with bright aluminum treadplate.

CAB LIFT

A hydraulic cab lift system shall be provided, consisting of an electric-powered hydraulic pump, fluid reservoir, dual lift cylinders, remote cab lift controls and all necessary hoses and valves. The hydraulic pump shall have a backup manual override, for use in the event of an electrical failure.

The cab lift controls shall be located at the driver side front of the cab, easily accessible under the full width front access hood. The controls shall include a permanently mounted raise/lower switch. For enhanced visibility during cab tilt operations, a remote control tether with on/off switch shall be supplied on a coiled cord that shall extend from 2.00' (coiled) to 6.00' (extended).

The cab shall be capable of tilting 42 degrees and 80 degrees with crane assist to accommodate engine maintenance and removal. The cab pivots shall be located 46.00" apart to provide stability while tilting the cab.

The rear of the cab shall be locked down by a two (2)-point, automatic, hydraulic, double hook mechanism that fully engages after the cab has been lowered (self-locking). The dual 2.25" diameter hydraulic cylinders shall be equipped with a velocity fuse that protects the cab from accidentally descending when the cab is in the tilt position.

For increased safety, a redundant mechanical stay arm shall be provided that must be manually put in place on the driver side between the chassis and cab frame when cab is in the raised position. This device shall be manually stowed to its original position before the cab can be lowered.

	Bidder Complies	
	Yes	No

Cab Lift Interlock

The cab lift safety 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 formed bright finished grille surround, shall be provided on the front center of the cab, and shall serve as an air intake to the radiator.

DOOR JAMB SCUFFPLATES

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

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

The forward cab and crew cab doors shall be the half-height style door. To enhance entry and egress to the cab, the forward cab doors shall be a minimum of 43.59" wide x 64.71" high. The crew cab doors shall measure a minimum of 37.87" wide x 73.75" high.

The forward cab and crew cab doors shall be constructed of extruded aluminum with a nominal material thickness of .125". The exterior door skins shall be constructed from .090" aluminum.

The forward cab door windows shall include a 7.50" high x 10.00" wide drop area at the front to enhance visibility.

A customized, vertical, pull-down type door handle shall be provided on the exterior of each cab door. 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 locks shall be capable of activating when the doors are open

	Bidder Complies	
	Yes	No

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 .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.

A dark grey vacuum formed ABS panel shall house the window switches and shall mold into the upper sill of the door panel.

The cab steps at each cab door location shall be located below the cab doors and shall be exposed to the exterior of the cab.

DOOR PANELS

The inner cab door panels shall be constructed out of polished stainless steel. The cab door panels shall be removable without disconnecting door and window mechanisms.

RECESSED POCKET WITH ELASTIC COVER

To provide organized storage (clutter control) in the cab for miscellaneous equipment, the cab interior shall be provided with recessed storage pockets. The pockets shall be 6.50" wide x 2.12" high x 6.00" deep and shall be constructed of rugged, impact resistant, roto-molded low-density polyethylene. The pockets shall be provided with a perforated elastic material cover to secure the equipment in the pocket. The pockets shall be installed in all available mounting locations of the overhead console.

ELECTRIC WINDOW CONTROLS

Each cab entry door shall be equipped with an electrically operated tempered glass window. A window control panel shall be ergonomically molded into the armrest of the door panel within easy reach of the respective occupant. Each switch shall allow intermittent or auto down operation for ease of use. Auto down operation shall be actuated by holding the window down switch for approximately 1/2 second. The driver control panel shall contain a control switch for each cab door's window. All other door control panels shall contain a single switch to operate the window within that door.

The window switches shall be connected directly to the battery power. This allows the windows to be raised and lowered when the battery switch is in the off position.

ELECTRIC CAB DOOR LOCKS

The front driver and passenger doors shall have a door lock master switch (custom designed rotary lock knob) built into the interior door latch that shall control all front and rear side exit door locks. Each rear cab door shall have its own lock control. Each door shall have a keyed exterior lock mechanism built into the door handle assembly.

	Bidder Complies	
	Yes	No
There shall be one (1) concealed switch on the exterior of the cab, located under the front bumper on the driver side, that operates the cab door locks. The lock system shall include two (2) key FOBs that allow for keyless entry into the vehicle. The key FOB system shall use code hopping technology for high security and be FCC part 15 compliant. **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 31.00" wide, and the crew cab steps shall be 24.25" wide with an 8.00" minimum depth. The inside cab steps shall not exceed 18.00" in height and be limited to two (2) steps. Three (3) step entrance designs shall not be acceptable due to safety concerns. A slip-resistant handrail shall be provided adjacent to each cab door opening to assist during cab ingress and egress. **STIRRUP STEPS** A stirrup step shall be provided below each cab and crew cab door. The steps shall be designed with a grip pattern punched into bright aluminum treadplate material providing support, slip resistance, and drainage. The steps shall be a bolt-on design and provide a 18.50" wide x 5.00" deep stepping surface. Each step shall provide a step height of 8.25" from the top of the stirrup step to the first step of the cab. The stirrup step shall be lit by a white 12 volt DC LED light provided on the step. The step light shall be activated automatically when the battery switch is on and the exit doors are opened or by the same means as the body step lights. **STEP LIGHTS** For reduced overall maintenance costs compared to incandescent lighting, there shall be four (4) white LED step lights provided. The lights shall be installed at each cab and crew cab door, one (1) per step. The lights shall be located in the driver side front doorstep, driver side crew cab doorstep, passenger side front doorstep and passenger side crew cab doorstep. In order to ensure exceptional illumination, each light shall provide a minimum of 25 foot-candles (fc) covering an entire 15.00" x 15.00" square placed 10.00" below the light and a minimum of 1.5 fc covering an entire 30.00" x 30.00" square at the same 10.00" distance below the light. The lights shall be activated when the adjacent door is opened.		

	Bidder Complies	
	Yes	No

FENDER CROWNS

Rubber fender crowns shall be provided around the cab wheel openings.

Crowns shall be black.

CREW CAB WINDOWS

One (1) fixed window with tinted glass shall be provided on each side of the cab, to the rear of the front cab door. The windows shall be sized to enhance light penetration into the cab interior. The windows shall measure 20.00" wide x 20.50" high.

WINDOW PROTECTOR BARS

One (1) removable bar shall be provided on the inside of each crew cab door, to protect the windows from damage. The bar shall be fabricated from 1.125" stainless steel tubular stock and stainless steel mounting tabs. The guards shall be easily removable for cleaning.

WINDOW TINT

Crew cab windows shall be provided with increased tint to 14 percent to reduce light transmission. The following windows are included:

- Crew cab side windows

- Crew cab door, roll-up windows

- Top fixed window in crew cab doors

- Rear opera windows (If applicable)

- All windows in raised roof (If applicable)

CAB ROOF TREADPLATE

The horizontal surface of the cab roof shall be covered with bright aluminum embossed treadplate. The aluminum treadplate shall be bonded to the cab and cover the full width and length of the cab. Edges shall be properly caulked to prevent water from leaking under the aluminum.

No front or side warning lights, or any other auxiliary options, shall be mounted on top of the treadplate. The treadplate shall extend and terminate next to all objects mounted on the roof.

MOUNTING PLATE ON ENGINE TUNNEL

Equipment installation provisions shall be installed on the engine tunnel.

A 0.25" smooth aluminum plate shall be bolted to the top surface of the engine tunnel. The plate shall be located to the left of the officer and on the rear of the tunnel. It shall follow the contour

	Bidder Complies	
	Yes	No

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

With safety as the primary objective, the wrap-around style, high impact ABS polymer cab instrument panel shall be designed with unobstructed visibility to instrumentation. The dash layout shall provide the driver with a quick reference to gauges that allows more time to focus on the road. The center console shall be a high impact ABS polymer, and shall be easily removable for access to the defroster. The center console shall include louvers strategically located for optimal air flow and defrost capability to the windshield. The passenger side dashboard shall be constructed of painted aluminum for durability and low maintenance. For enhanced versatility, the passenger side dash shall include a flat working surface. To provide optional (service friendly) control panels, switches and storage modules, a three (3)-piece, 4mm thick polyethylene roto-molded overhead console shall also be provided. To complete the cab front interior design, painted aluminum modesty panels shall be provided under the dash on both sides of the cab. The driver side modesty panel shall provide mounting for the battery switch and diagnostic connectors, while the passenger side modesty panel provides a glove box, and ground access to the main electrical distribution panel via quick quarter turn fasteners.

To provide a deluxe automotive interior, the engine tunnel shall be covered by a leather grain vinyl that is resistant to oil, grease, and mildew. For durability and ease of maintenance, the cab interior side walls and rear wall shall be painted aluminum.

The inner cab door panels shall include grab handles and control panels molded into the upper section of the door panel. The door panels shall extend 36.50" down from the door window.

The headliner shall be installed in both forward and rear cab sections. The crew cab headliner shall be one (1)-piece (no exception). The headliner panel shall be a composition of a corrugated high density polyethylene panel covered with a sound barrier and upholstery. For quick, easy access of electrical wiring, or to perform other maintenance needs without stripping screws, the headliner shall be held in place by a dual lock fastening system that shall require no tools for installation or removal. Headliner installation requiring removal of mechanical fasteners shall not be acceptable.

The cab structure shall include designated raceways for electrical harness routing from the front of the cab to the rear upper portion of the cab. Raceways shall be extruded in the forward door frame, floor, walls and overhead in the area where the walls meet the ceiling. The raceways located in the floor shall be covered by aluminum extrusion, while the vertical and overhead raceways shall be covered by a decorative composite panel. The raceways shall improve harness

	Bidder Complies	
	Yes	No
integrity by providing a continuous harness path that eliminates wire chafing and abrasion associated with exposed wiring or routing through drilled metal holes. Harnesses shall be laid in place, not pulled through holes drilled in aluminum tubing. Once laid in place, all harnesses shall be held in position by a hook and loop fastening system. The hook and loop system shall allow for bracket fastener points to not puncture harnesses. The raceways shall include removable covers, providing maintenance personnel with quick and easy access for trouble shooting, or the addition of accessories. Harnesses shall be located within the raceway behind the wire way cover. **CAB INTERIOR UPHOLSTERY** The cab interior upholstery shall be dark silver gray. All cab interior materials shall meet FMVSS 302 (flammability of interior materials). **INTERIOR PAINT (CAB)** The cab interior metal surfaces shall be painted gray, vinyl texture paint. **CAB FLOOR** The cab and crew cab flooring shall be constructed with bright aluminum treadplate. **CAB DEFROSTER** To provide maximum defrost and heating performance, a 54,961 BTU heater-defroster unit with 558 SCFM of air flow shall be provided inside the cab. The defroster unit shall be strategically located under the center forward portion of the roto-molded instrument panel. For easy access, a removable roto-molded cover shall be installed over the defroster unit. The defroster shall include an integral aluminum frame air filter, high performance dual scroll blowers, and ducts designed to provide maximum defrosting capabilities for the 1-piece windshield. The defroster ventilation shall be built into the design of the cab dash instrument panel and shall be easily removable for maintenance. The defroster shall 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 CAB HEATER** Two (2) 36,702 BTU auxiliary heaters with 276 SCFM (each unit) of air flow shall be provided inside the crew cab, one (1) within each rear facing seat riser. The heaters shall include high performance dual scroll blowers, one (1) for each unit. Outlets for the heaters shall be located below each rear facing seat riser and below the fronts of the driver and passenger seats, for efficient airflow. An extruded aluminum plenum shall be incorporated in the cab structure that shall transfer heat to the forward cab seating positions.		

	Bidder Complies	
	Yes	No
The heater/defroster and crew cab heaters shall be controlled by a single integral electronic control panel. The heater control panel shall allow the driver to control heat flow to the front and rear simultaneously. The control panel shall include variable adjustment for temperature and fan control, and be conveniently located on the dash in clear view of the driver. The control panel shall include highly visible, progressive LED indicators for both fan speed and temperature. **AIR CONDITIONING** A high-performance, customized air conditioning system shall be furnished inside the cab and crew cab. A 19.10 cubic inch compressor shall be installed on the engine. The air conditioning system shall be capable of cooling the average cab temperature from 100 degrees Fahrenheit to 64 degrees Fahrenheit in the forward section of the cab, and 69 degrees Fahrenheit in the rear section of the cab, at 50 percent relative humidity within 30 minutes. The cooling performance test shall be run only after the cab has been heat soaked at 100 degrees Fahrenheit for a minimum of 4 hours. A roof-mounted condenser with a 63,000 BTU output that meets and exceeds the performance specification shall be installed on the cab roof. Mounting the condenser below the cab or body would reduce the performance of the system and shall not be acceptable. The condenser cover and mounting legs to be painted white as provided by manufacturer. The evaporator unit shall be installed in the cab, located in the center of the cab ceiling over the engine tunnel. The evaporator shall include two (2) high performance cores and plenums with multiple outlets, one (1) plenum directed to the front and one (1) plenum directed to the rear of the cab. The evaporator unit shall have a 49,000 BTU rating that meets and exceeds the performance specifications. Adjustable air outlets shall be strategically located on the evaporator cover per the following: • Two (2) shall be directed towards the drivers location • Two (2) shall be directed towards the officers location • Six (6) shall be directed towards crew cab area The air conditioner refrigerant shall be R-134A and shall be installed by a certified technician. The air conditioner shall be controlled by a single integral electronic control panel for the heater, defroster and air conditioner. For ease of operation, the control panel shall include variable adjustment for temperature and fan control, and be conveniently located on the dash in clear view of the driver. The control panel shall include highly visible, progressive LED indicators for both fan speed and temperature.		

	Bidder Complies	
	Yes	No

INTERIOR CAB INSULATION

The cab walls, ceiling and engine tunnel shall be insulated in all strategic locations to maximize acoustic absorption and thermal insulation. The cab shall be insulated with 2.00" insulation in the rear wall, 3.00" insulation in the side walls, and 1.50" insulation in the ceiling. Headliners shall be constructed from a 0.20" high density polyethylene corrugated material. Each headliner shall be wrapped with a 0.25" thick foil faced poly damp low emissivity foam insulation barrier for acoustic and thermal control. For ease of installation and removal, all headliners shall be held in place by a dual lock fastening system. Headliner installation requiring removal of mechanical fasteners shall not be acceptable.

Designed for maximum sound absorption and thermal insulation, the rear cab wall shall be insulated with a 1.50" thick open cell acoustical foam. The thermal protection of the foam shall provide and R-value of 4 per 1.00" thickness.

SUN VISORS

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

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

GRAB HANDLE

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

ENGINE COMPARTMENT LIGHTS

There shall be two (2) Truck-Lite Model 44308C 4.00" white LED light(s) with Model 40700 grommet(s) installed under the engine hood for use as engine compartment illumination.

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

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 door shall be 17.75" wide x 12.75" high and be flush with the wall of the engine tunnel.

The engine oil dipstick shall allow for checking only. The transmission dipstick shall allow for both checking and filling. An additional port shall be provided for filling the engine oil.

	Bidder Complies	
	Yes	No

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

MAP BOX

There shall be one (1) map box(es) with four (4) bins, open from top. The location required shall be ship loose. The map box(es) shall be divided into four (4) bins, each being 12.50" wide x 3.00" high x 12.00" deep. Each bin shall slant 30 degrees from horizontal.

An additional storage area shall be located along each side the map storage area. This storage area shall be 4.00" wide x 6.00" high x 15.00" deep. Each side bin shall be divided into three (3) separate bin. Each smaller bin shall be 4.00" wide x 6.00" high x 5.00" deep.

The map box(es) shall be constructed of .125" aluminum and shall be painted to match the cab interior.

CAB SAFETY SYSTEM

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

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

	Bidder Complies	
	Yes	No

FRONTAL IMPACT PROTECTION

The SRS system shall provide protection during a frontal or oblique impact event. The system shall activate when the vehicle decelerates at a predetermined G force known to cause injury to the occupants. The cab and chassis shall have been subjected, via third party test facility, to a crash impact during frontal and oblique impact testing. Testing included all major chassis and cab components such as mounting straps for fuel and air tanks, suspension mounts, front suspension components, rear suspensions components, frame rail cross members, engine and transmission and their mounts, pump house and mounts, frame extensions and body mounts. The testing provided configuration specific information used to optimize the timing for firing the safety restraint system. The sensor shall activate the pyrotechnic devices when the correct crash algorithm, wave form, is detected (no exception).

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

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

SIDE ROLL PROTECTION

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

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

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

SEATING CAPACITY

The seating capacity in the cab shall be five (5).

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 electric controls to adjust the rake (15 degrees), height (1.12" travel) and horizontal (7.75" travel) position. Electric controls shall be located below the forward part of the seat cushion. To provide flexibility for multiple driver configurations, the seat shall have a reclining back, adjustable from 20 degrees back to 45

	Bidder Complies	
	Yes	No

degrees forward. Providing for maximum comfort, the seat back shall be a high back style with manual lumbar adjustment lever, for lower back support, and shall include minimum 7.50" deep side bolster pads for maximum support. The lumbar adjustment lever shall be easily located at the lower outboard position of the seat cushion. For optimal comfort, the seat shall be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control).

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

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

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

OFFICER SEAT

A seat shall be provided in the cab for the passenger. 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. For optimal comfort, the seat shall be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat shall be equipped with seat belt sensors in the seat cushion and belt receptacle that shall activate an alarm indicating a seat is occupied but not belted.

The seat back shall be an SCBA back style with 7.5 degree fixed recline angle, and shall include minimum 4.50" wide x 7.50" deep side bolster pads for maximum support. 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 suspension seat safety system shall be included. When activated, this system shall pretension the seat belt and then retract the seat to its lowest travel position.

	Bidder Complies	
	Yes	No
The seat shall be furnished with a 3-point, shoulder type seat belt. The seat belt shall be furnished with dual automatic retractors that shall provide ease of operation in the normal seating position. **RADIO COMPARTMENT** A compartment for the radio amplifier shall be located on the floor of the cab behind the front passenger seat. A lift-up door with a chrome plated lift and turn latch shall be provided for access. The compartment shall be constructed of smooth aluminum and painted to match the cab interior. **REAR FACING DRIVER SIDE OUTBOARD SEAT** There shall be one (1) rear facing seat provided at the driver side outboard position in the crew cab. For optimal comfort, the seat shall be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat shall be equipped with seat belt sensors in the seat cushion and belt receptacle. It shall activate an alarm indicating a seat is occupied but not buckled. The seat back shall be an SCBA back style with 7.5 degree fixed recline angle, and shall include minimum 4.50" wide x 7.50" deep side bolster pads for maximum support. The SCBA cavity shall be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity shall be accomplished by unbolting, relocating, and re-bolting it in the desired location. The seat shall include the following features incorporated into the side roll protection system: • Side air curtain shall be mounted integral to the outboard bolster of the seat back. The air curtain shall be covered by a decorative panel when in the stowed position. • A seat safety system shall be included. When activated, this system shall pretension the seat belt around the occupant to firmly hold them in place in the event of a side roll. The seat shall be furnished with a 3-point, shoulder type seat belt. The seat belt shall be furnished with dual automatic retractors that shall provide ease of operation in the normal seating position. **REAR FACING PASSENGER SIDE OUTBOARD SEAT** There shall be one (1) rear facing seat provided at the passenger side outboard position in the crew cab. For optimal comfort, the seat shall be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat shall be equipped with seat belt sensors in the seat cushion and belt receptacle that shall activate an alarm indicating a seat is occupied but not buckled.		

	Bidder Complies	
	Yes	No
The seat back shall be an SCBA back style with 7.5 degree fixed recline angle, and shall include minimum 4.50" wide x 7.50" deep side bolster pads for maximum support. 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 and firmly hold the occupant in the event of a side roll. The seat shall be furnished with a 3-point, shoulder type seat belt. The seat belt shall be furnished with dual automatic retractors that shall provide ease of operation in the normal seating position. **FORWARD FACING DRIVER SIDE EMS COMPARTMENT** A forward facing EMS compartment shall be provided in the crew cab located at the driver side outboard position. The compartment shall be mounted off the floor approximately 6.00" to match the height of the center floor blister. The area below the compartment shall be left open. The compartment shall be 24.00" wide x 58.00" high x 14.00" deep with one (1) roll up door, non-locking, with white finish. The compartment shall be constructed of smooth aluminum, and painted to match the cab interior. **Compartment Light** There shall be one (1) white LED strip light installed on the left side of the compartment opening. The lights shall be controlled by an automatic door switch. **FORWARD FACING CENTER SEAT** There shall be one (1) forward facing seat provided at the center position in the crew cab. For optimal comfort, the seat shall be provided with 17.00" deep dual density foam cushions designed with EVC (elastomeric vibration control). To ensure safe operation, the seat shall be equipped with seat belt sensors in the seat cushion and belt receptacle that shall activate an alarm indicating a seat is occupied but not buckled. The seat back shall be an SCBA back style with 7.5 degree fixed recline angle, and shall include minimum 4.50" wide x 7.50" deep side bolster pads for maximum support. The SCBA cavity shall be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA		

	Bidder Complies	
	Yes	No

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 feature incorporated into the side roll protection system:

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

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

FORWARD FACING PASSENGER SIDE EMS COMPARTMENT

A forward facing EMS compartment shall be provided in the crew cab located at the passenger side outboard position. The compartment shall be mounted off the floor approximately 6.00" to match the height of the center floor blister. The area below the compartment shall be left open.

The compartment shall be 24.00" wide x 58.00" high x 14.00" deep with one (1) roll up door, non-locking, with white finish.

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

Compartment Light

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

SHELVING

There shall be two (2) shelves provided. Each shelf shall be constructed of 0.090" aluminum with a 1.25" up-turned lip. Shelving shall be infinitely adjustable by means of a threaded tightener sliding in a track.

The location shall be one (1) shelf in the driver side forward facing EMS cabinet and one (1) shelf in the passenger side forward facing EMS cabinet.

STORAGE COMPARTMENT, RAISED ROOF

There shall be an overhead rear-facing storage compartment installed at the raised roof within the crew cab. The compartment shall be 74.00" wide x 10.00" high x 14.00" deep at the bottom.

The compartment shall include two (2) lift up compartment doors. Non-locking latch paddle handle and gas operated stay arms shall be provided. There shall be no divider between each door opening.

	Bidder Complies	
	Yes	No

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

COMPARTMENT LIGHTS

The storage compartment lighting shall consist of one (1) white LED strip light installed horizontally above each compartment door opening. The lights shall be controlled by an automatic door switch.

SEAT UPHOLSTERY

All seat upholstery shall be gray woven with black Imperial 1200 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 four (4) SCBA brackets.

SEAT BELTS

All seating positions in the cab and crew cab 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 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.

SHOULDER HARNESS HEIGHT ADJUSTMENT

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

A total of five (5) seating positions shall have the adjustable shoulder harness.

	Bidder Complies	
	Yes	No

HELMET HOLDER

There shall be a total of four (4) Zico, Model UHH-1, helmet holder bracket(s) provided in the cab. The brackets shall provide secure storage and quick access to each helmet. The location of the helmet holder bracket(s) shall be determined at the time of final inspection.

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.

ADDITIONAL DOME LIGHTS

There shall be four (4) Weldon 8080/8081 series, dual LED dome lights with grey bezel(s) mounted in the cab and/or crew cab located One (1) each in the Driver, Officer side in the front and rear of the cab and 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 and the same switching as the crew cab dome lights.

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

OVERHEAD MAP LIGHTS

There shall be two (2) white halogen, round adjustable map lights installed in the cab:

- One (1) overhead in front of the driving position.
- One (1) overhead in front of the passenger's position.

Each light shall include a switch on the light housing.

The light switches shall be connected directly to the battery switched power.

	Bidder Complies	
	Yes	No

HAND HELD SPOTLIGHT

There shall be one (1) spotlight provided which shall be a Whelen, Model P36HHS LED hand held spot light(s) installed in the Officer's seat work area (wired but not mounted). The light(s) shall be furnished with a coil cord and a stainless steel bracket mounting bracket.

CAB INSTRUMENTATION

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

GAUGES

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

Voltmeter gauge (Volts)

Low volts (11.8 VDC)

Amber indicator on gauge assembly with alarm

High volts (15 VDC)

Amber indicator on gauge assembly with alarm

Very low volts (11.3 VDC)

Amber indicator on gauge assembly with alarm

Very high volts (16 VDC)

Amber indicator on gauge assembly with alarm

Tachometer (RPM)

Speedometer (Primary (outside) MPH, Secondary (inside) Km/H)

Fuel level gauge (Empty - Full in fractions)

Low fuel (1/8 full)

Amber indicator on gauge assembly with alarm

	Bidder Complies	
	Yes	No
Very low fuel (1/32) fuel Amber indicator on gauge assembly with alarm Engine oil pressure gauge (PSI) Low oil pressure to activate engine warning lights and alarms Red indicator on gauge assembly with alarm Front air pressure gauge (PSI) Low air pressure to activate warning lights and alarm Red indicator on gauge assembly with alarm Rear air pressure gauge (PSI) Low air pressure to activate warning lights and alarm Red indicator on gauge assembly with alarm Transmission oil temperature gauge (Fahrenheit) High transmission oil temperature activates warning lights and alarm Amber indicator on gauge assembly with alarm Engine coolant temperature gauge (Fahrenheit) High engine temperature activates an engine warning light and alarm Red indicator on gauge assembly with alarm Diesel Exhaust Fluid Level Gauge (Empty - Full in fractions) Low fluid (1/8 full) Amber indicator on gauge assembly with alarm All gauges and gauge indicators shall perform prove out at initial power-up to ensure proper performance. **INDICATOR LAMPS** To promote safety, the following telltale indicator lamps shall be integral to the gauge assembly and are located above and below the center gauges. The indicator lamps shall be "dead-front"		

	Bidder Complies	
	Yes	No
design that is only visible when active. The colored indicator lights shall have descriptive text or symbols. The following amber telltale lamps shall be present: Low coolant Trac cntl (traction control) (where applicable) Check engine Check trans (check transmission) Aux brake overheat (Auxiliary brake overheat) Air rest (air restriction) Caution (triangle symbol) Water in fuel DPF (engine diesel particulate filter regeneration) Trailer ABS (where applicable) Wait to start (where applicable) HET (engine high exhaust temperature) (where applicable) ABS (antilock brake system) MIL (engine emissions system malfunction indicator lamp) (where applicable) SRS (supplemental restraint system) fault (where applicable) DEF (low diesel exhaust fluid level) The following red telltale lamps shall be present: Warning (stop sign symbol) Seat belt Parking brake Stop engine		

	Bidder Complies	
	Yes	No
Rack down The following green telltale lamps shall be provided: Left turn Right turn Battery on The following blue telltale lamp shall be provided: High beam **ALARMS** Audible steady tone warning alarm: A steady audible tone alarm shall be provided whenever a warning message is present. Audible pulsing tone caution alarm: A pulsing audible tone alarm (chime/chirp) shall be provided whenever a caution message is present without a warning message being present. Alarm silence: Any active 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** Telltale indicators and alarms shall perform prove-out at initial power-up to ensure proper performance. **CONTROL SWITCHES** For ease of use, the following controls shall be provided immediately adjacent to the cab instrument panel within easy reach of the driver. Emergency master switch: A molded plastic push button switch with integral indicator lamp shall be provided. Pressing the switch shall activate emergency response lights and siren control. A green lamp on the switch provides indication that the emergency master mode is active. Pressing the switch again disables the emergency master mode. Headlight / Parking light switch: A three (3)-position maintained rocker switch shall be provided. The first switch position shall deactivate all parking lights and the headlights. The		

	Bidder Complies	
	Yes	No
second switch position shall activate the parking lights. The third switch position shall activate the headlights. Panel backlighting intensity control switch: A three (3)-position momentary rocker switch shall be provided. The first switch position decreases the panel backlighting intensity to a minimum level as the switch is held. The second switch position is the default position that does not affect the backlighting intensity. The third switch position increases the panel backlighting intensity to a maximum level as the switch is held. The following standard controls shall be integral to the gauge assembly and are located below the right hand gauges. All switches have backlit labels for low light applications. High idle engagement switch: A two (2)-position momentary rocker switch with integral indicator lamp shall be provided. The first switch position is the default switch position. The second switch position shall activate and deactivate the high idle function when pressed and released. The "Ok To Engage High Idle" indicator lamp must be active for the high idle function to engage. A green indicator lamp integral to the high idle engagement switch shall indicate when the high idle function is engaged. "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. The following standard controls shall be provided adjacent to the cab gauge assembly within easy reach of the driver. All switches shall have backlit labels for low light applications. Ignition switch: A three (3)-position maintained/momentary rocker switch shall be provided. The first switch position shall deactivate vehicle ignition. The second switch position shall activate vehicle ignition. The third momentary position shall disable the audible alarm if held for three (3) to five (5) seconds. A green indicator lamp shall be activated with vehicle ignition. 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. 4-way hazard switch: A two (2)-position maintained rocker switch shall be provided. The first switch position shall deactivate the 4-way hazard switch function. The second switch position shall activate the 4-way hazard function. The switch actuator shall be red and includes the international 4-way hazard symbol. Heater, defroster, and optional air conditioning control panel: A control panel with membrane switches shall be provided to control heater/defroster temperature and heater, defroster, and air		

	Bidder Complies	
	Yes	No

conditioning fan speeds. A green LED status bar shall indicate the relative temperature and fan speed settings.

Turn signal arm: A self-canceling turn signal with high beam headlight and windshield wiper/washer controls shall be provided. The windshield wiper control shall have high, low, and intermittent modes.

Parking brake control: An air actuated push/pull park brake control valve shall be provided.

Chassis horn control: Activation of the chassis horn control shall be provided through the center of the steering wheel.

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 overhead console on the driver's side, up to four (4) switch panels in the engine tunnel console facing the driver, up to four (4) switch panels in the overhead console on the officer's side and up to two (2) switch panels in the engine tunnel console facing the officer. All switches shall have backlit labels for low light applications.

DIAGNOSTIC PANEL

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

Engine diagnostic port

Transmission diagnostic port

ABS diagnostic port

SRS diagnostic port (where applicable)

USB diagnostic port

Engine diagnostic switch (blink codes flashed on check engine telltale indicator)

ABS diagnostic switch (blink codes flashed on ABS telltale indicator)

Diesel particulate filter regeneration switch (where applicable)

Diesel particulate filter regeneration inhibit switch (where applicable)

	Bidder Complies	
	Yes	No

CAB LCD DISPLAY

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

AIR RESTRICTION INDICATOR

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

"DO NOT MOVE APPARATUS" INDICATOR

A Whelen, Model M2R flashing red indicator light with a chrome bezel, 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 the gauge panel LCD located forward of the steering wheel directly in front 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's Side Cab Door Open)
- PS Cab Door Open (Passenger's Side Cab Door Open)
- DS Crew Cab Door Open (Driver's Side Crew Cab Door Open)
- PS Crew Cab Door Open (Passenger's Side Crew Cab Door Open)
- DS Body Door Open (Driver's Side Body Door Open)
- PS Body Door Open (Passenger's SIde Body Door Open)
- Rear Body Door Open
- DS Ladder Rack Down (Driver's Side Ladder Rack Down)

	Bidder Complies	
	Yes	No

- PS Ladder Rack Down (Passenger's Side Ladder Rack Down)
- Deck Gun Not Stowed
- Lt Tower Not Stowed (Light Tower Not Stowed)
- Hatch Door Open
- Fold Tank Not Stowed (Fold-A-Tank Not Stowed)
- Aerial Not Stowed (Aerial Device Not Stowed)
- Stabilizer Not Stowed
- Steps Not Stowed
- Handrail(s) 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) switch assignments shall include non-functioning black appliqués. Documentation shall be provided by the manufacturer indicating the rated cycle life of the switches. The switch panel(s) shall be located in the overhead position above the windshield on the driver side overhead to allow for easy access.

Additional switch panel(s) shall 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 label indicating the use of each switch shall be placed in the center of the switch. The label shall allow light to pass through the letters for ease of use in low light conditions.

WIPER CONTROL

For simple operation and easy reach, the windshield wiper control shall be an integral part of the directional light lever located on the steering column. The wiper control shall include high and low wiper speed settings, a one (1) speed intermittent wiper control with six (6) second interval and windshield washer switch. The control shall have a return to park provision, which allows the wipers to return to the stored position when the wipers are not in use.

	Bidder Complies	
	Yes	No
The wipers shall cease operation 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 switched 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 mounted under the instrument panel to the drivers right near where the pump shift is located. Termination shall be with 3/8" studs and plastic covers. 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 six (6) 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 with two (2) sets on the officer's side engine tunnel • Termination shall be with 15 amp, power point plug with rubber cover • Wires shall be sized to 125 percent of the protection The circuit(s) may be load managed when the parking brake is set. **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:		

	Bidder Complies	
	Yes	No

- 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 on the driver's side of the engine tunnel
- Termination shall be with 3/8" studs and plastic covers
- 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 auxiliary 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 in the Electrical distribution panel area
- Termination shall be with 3/8" studs and plastic covers
- Wires shall be sized to 125% of the protection

RECESS, DASH PANEL

The dash panel across from the officer shall be recessed to accommodate the mounting of miscellaneous items. The recess shall be 8.25" down x 7.81" back and 20.88" wide.

INFORMATION CENTER

A LCD display integral to the cab gauge panel shall be included as outlined in the cab instrumentation area. The LCD display shall be programmed to read US Customary.

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:

	Bidder Complies	
	Yes	No

- 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. 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 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.

INTERCOM SYSTEM

There shall be digital, dual radio interface, intercom located in the cab. The front panel shall have master volume, and squelch controls with illuminated indicators, allowing for independent level setting of radio and auxiliary audio devices.

There shall be two (2) radio listen only / transmit controls, allowing for simulcast interoperability with select, monitor, receive, and transmit indicators. There shall be two (2) auxiliary audio inputs with select, and receive indicators.

There shall be one (1) wireless base station for up to five (1-5) headset users provided.

The wireless base station shall have a 100' to 1100' range, line of sight. Objects between the transmitter and receiver affect range.

The following Firecom components shall be provided:

	Bidder Complies	
	Yes	No

- One (1) 5200D Intercom
- One (1) WB505R wireless base station (Up to 5 wireless positions)
- All necessary power and station cabling

RADIO / INTERCOM INTERFACE CABLE

The apparatus manufacturer shall supply and install two (2) radio interface cables before delivery of the vehicle.

The radio equipment to be used by the customer shall be:

- Make of First Radio: Motorola, Model Number: Motorola PM 1500.
- Make of Second Radio: Motorola, Model Number: Motorola CM 300.

WIRELESS UNDER HELMET, INTERCOM ONLY HEADSET

There shall be three (3) Firecom™, Model UHW-503 wireless under the helmet, intercom only headset(s) provided. A heavy duty, coiled 12 volt charging pigtail with plug shall be provided in the rear crew cab.

Each headset shall feature:

- Noise cancelling electric microphone
- Flexible microphone boom
- Ear seals with 20 dB noise reduction
- Programmable Microphone transmit button
- Rechargeable battery operates 24 hours on a full charge
- IP-66 when worn

WIRELESS UNDER HELMET, RADIO TRANSMIT ONLY HEADSET

There shall be two (2) Firecom™, Model UHW-505, wireless under the helmet, radio transmit headset(s) provided. A heavy duty, coiled 12 volt charging pigtail with plug shall be provided driver's seat and officer seat.

Each headset shall feature:

- Noise cancelling electric microphone
- Flexible microphone boom
- Ear seals with 20 dB noise reduction
- Stereo Listen-Through Ear dome microphones
- Radio Push To Transmit button (Left or Right Side)
- Rechargeable battery operates for 24 hours on a full charge
- IP-66 when worn

	Bidder Complies	
	Yes	No

HEADSET HANGERS

There shall be five (5) headset hanger(s) installed driver's seat, officer's seat, driver's side outboard rear facing seat, passenger's side outboard rear facing seat and rear, center, forward facing seat. The hanger(s) shall meet NFPA 1901, Section 14.1.11, requirement for equipment mounting.

INTERCOM SYSTEM REMOTE HEAD

A Firecom, Model 5200DRH, remote intercom control head shall be provided and mounted in the Officer's overhead switch panel.

TWO WAY RADIO INSTALLATION

There shall be two (2) customer supplied two way radio(s) sent to the apparatus manufacturers preferred radio installer to be installed stacked together on the engine tunnel next to the Officer's seat per the shipping document.

PM 1500 radio is a dual head and will require one (1) head to be installed in the radio compartment on the pump panel, the second head will be at terminate on engine tunnel.

No antenna mount or whip shall be included in this option.

Specific shipping requirements shall be followed.

RADIO ANTENNA MOUNT

There shall be two (2) standard 1.125", 18 thread antenna-mounting base(s) installed one (1) on the left side and one (1) on the right side on the cab roof with high efficiency, low loss, coaxial cable(s) routed to the instrument panel area, with one (1) terminated to the UHF radio on engine tunnel. The second cable shall be terminated at base radio unit of the Motorola PM 1500 radio. A weatherproof cap shall be installed on the mount.

VIDEO SYSTEM, REAR CAMERA & 7.00" LCD DISPLAY

A Safety Vision video system with color rear view camera with built in microphone, activated with the reverse signal, and 7.00" LCD display monitor with swivel mount located in view of the driver on the dash shall be provided.

The following components shall be supplied:

- One (1) SV-LCD70BA 7" Color LCD
- One (1) SV-620A Color camera
- All necessary cables

	Bidder Complies	
	Yes	No

VEHICLE CAMERA GUARD

There shall be one (1) aluminum treadplate guard(s) fastened over the vehicle camera(s) located at the rear .

KNOX-BOX

There shall be a Knox-Box® KeySecure® 3, Model 2651, with key pad access provided. The system shall allow all administration functions to be performed via a USB port. It shall have a blue strobe light to warn when the master key is in an unsecured position. The box shall be surface mounted and installed on the mounting plate in the Officer's seat work area, within the cab.

ELECTRICAL POWER CONTROL SYSTEM

The primary power distribution shall be located forward of the officer's seating position and be easily accessible while standing on the ground for simplified maintenance and troubleshooting. Additional electrical distribution centers shall be provided throughout the vehicle to house the vehicle's electrical power, circuit protection, and control components. The electrical distribution centers shall be located strategically throughout the vehicle to minimize wire length. For ease of maintenance, all electrical distribution centers shall be easily accessible. All distribution centers containing fuses, circuit breakers and/or relays shall be easily accessible.

Distribution centers located throughout the vehicle shall contain battery powered studs for supplying customer installed equipment thus providing a lower cost of ownership.

Circuit protection devices, which conform to SAE standards, shall be utilized to protect electrical circuits. All circuit protection devices shall be rated per NFPA requirements to prevent wire and component damage when subjected to extreme current overload. General protection circuit breakers shall be Type-I automatic reset (continuously resetting). When required, automotive type fuses shall be utilized to protect electronic equipment. Control relays and solenoid shall have a direct current rating of 125 percent of the maximum current for which the circuit is protected per NFPA.

SOLID-STATE CONTROL SYSTEM

A solid-state electronics based control system shall be utilized to achieve advanced operation and control of the vehicle components. A fully computerized vehicle network shall consist of electronic modules located near their point of use to reduce harness lengths and improve reliability. The control system shall comply with SAE J1939-11 recommended practices.

Factory and field re programmable to accommodate changes to the vehicle's operating parameters

	Bidder Complies	
	Yes	No
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 reprogrammable to accommodate changes to the vehicle's operating parameters • Complete operating and troubleshooting manuals • USB connection to the main control module for advanced troubleshooting To assure long life and operation in a broad range of environmental conditions, the solid-state control system modules shall meet the following specifications: • Module circuit board shall meet SAE J771 specifications • Operating temperature from -40C to +70C • Storage temperature from -40C to +70C • Vibration to 50g IP67 rated enclosure (Totally protected against dust and also protected against the effect of temporary immersion between 15 centimeters and one (1) meter) Operating voltage from eight (8) volts to 16 volts DC The main controller shall activate status indicators and audible alarms designed to provide warning of problems before they become critical. **CIRCUIT PROTECTION AND CONTROL DIAGRAM** Copies of all job-specific, computer network input and output (I/O) connections shall be provided with each chassis. The sheets shall indicate the function of each module connection point, circuit protection information (where applicable), wire numbers, wire colors and load management information.		

	Bidder Complies	
	Yes	No

ON-BOARD ELECTRICAL SYSTEM DIAGNOSTICS

Advanced on-board diagnostic messages shall be provided to support rapid troubleshooting of the electrical power and control system. The diagnostic messages shall be displayed on the information center located at the driver's position.

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

TECH MODULE

An in cab module will provide an interface and data logging capability.

The module will allow two (2) levels of user interface. The firefighter level will allow vehicle monitoring of the vehicle and firefighting systems on the apparatus. The technician level will allow diagnostic access to inputs and outputs installed on the,or equivalent control and information system.

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

A USB connection will be provided on the Tech Module. It will provide a means to download data logger information and update software in the device.

PROGNOSTICS

A software based vehicle tool shall be provided to predict remaining life of the vehicles critical fluid and events (no exceptions).

The system shall send automatic indications to the color display and/or wireless enabled device to proactively alert of upcoming service intervals.

Prognostics shall include:

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

	Bidder Complies	
	Yes	No

ADVANCED DIAGNOSTICS

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

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

INDICATOR LIGHT AND ALARM PROVE-OUT SYSTEM

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

VOLTAGE MONITOR SYSTEM

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

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

DEDICATED RADIO EQUIPMENT CONNECTION POINTS

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

The studs shall consist of the following:

- 12-volt 40-amp battery switched power
- 12-volt 60-amp ignition switched power
- 12-volt 60-amp direct battery power

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

ENHANCED SOFTWARE

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

All perimeter lights and scene lights (where applicable) shall be deactivated when the parking brake is released.

Cab and crew cab dome lights shall remain on for ten (10) seconds for improved visibility after the doors close. The dome lights shall dim after ten (10) seconds or immediately if the vehicle is put into gear.

	Bidder Complies	
	Yes	No

Cab and crew cab perimeter lights shall remain on for ten (10) seconds for improved visibility after the doors close. The dome lights shall dim after ten (10) seconds or immediately if the vehicle is put into gear.

EMI/RFI PROTECTION

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

The apparatus shall have the ability to operate in the electromagnetic environment typically found in fire ground operations to ensure clean operations. The electrical system shall meet, without exceptions, electromagnetic susceptibility conforming to SAE J1113/25 Region 1, Class C EMR for 10Khz-1GHz to 100 Volts/Meter. The vehicle OEM, upon request, shall provide EMC testing reports from testing conducted on an entire apparatus and shall certify that the vehicle meets SAE J551/2 and SAE J1113/25 Region 1, Class C EMR for 10Khz-1GHz to 100 Volts/Meter requirements. Component and partial (incomplete) vehicle testing is not adequate as overall vehicle design can impact test results and thus is not acceptable by itself.

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

ELECTRICAL

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

Electrical wiring and equipment shall be installed utilizing the following guidelines:

1. All holes made in the roof shall be caulked with silicon, rope caulk is not acceptable. Large fender washers, liberally caulked, shall be used when fastening equipment to the underside of the cab roof.

	Bidder Complies	
	Yes	No

2. Any electrical component that is installed in an exposed area shall be mounted in a manner that shall not allow moisture to accumulate in it. Exposed area shall be defined as any location outside of the cab or body.
3. Electrical components designed to be removed for maintenance shall not be fastened with nuts and bolts. Metal screws shall be used in mounting these devices. Also a coil of wire shall be provided behind the appliance to allow them to be pulled away from mounting area for inspection and service work.
4. Corrosion preventative compound shall be applied to all terminal plugs located outside of the cab or body. All non-waterproof connections shall require this compound in the plug to prevent corrosion and for easy separation (of the plug).
5. All lights that have their sockets in a weather exposed area shall have corrosion preventative compound added to the socket terminal area.
6. All electrical terminals in exposed areas shall have silicon (1890) applied completely over the metal portion of the terminal.

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

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

The results of the tests shall be recorded and provided to the purchaser at time of delivery.

BATTERY SYSTEM

Five (5) 12 volt maintenance free group 31 batteries that include the following features, each, shall be provided:

- 1000 CCA (cold cranking amps)
- 185 reserve capacity
- High cycle
- Ref. CA of 1190 at 0 degrees Fahrenheit
- 185 reserve capacity
- Threaded studs

ISOLATED BATTERY

One (1) 12 volt battery shall be provided for voltage sensitive components. A battery isolator that is appropriately suited for the battery capacity shall be supplied.

	Bidder Complies	
	Yes	No

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

The batteries shall be stored in well-ventilated compartments that are located under the cab and bolted directly to the chassis frame. The battery compartments shall be constructed of 3/16" steel plate and be designed to accommodate a maximum of three (3) group 31 batteries in each compartment. The compartments shall include formed fit heavy-duty roto-molded polyethylene battery tray inserts with drains on each side of the frame rails. The batteries shall be mounted inside of the roto-molded trays.

JUMPER STUDS

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

BATTERY CHARGER/ AIR COMPRESSOR

There shall be a Kussmaul™ Pump Plus 1200, Model # 52-21-1100, single output battery charger/air compressor system shall be provided. A display bar graph indicating the state of charge shall be included.

The automatic charger shall maintain one (1) set of batteries with a maximum output current of 40 amps.

The 12-volt air compressor shall be installed to maintain the air system pressure when the vehicle is not in use.

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

Battery charger/compressor shall be located in D3 (up high and forward of the vertical partition.

The battery charger indicator shall be located near the driver's seat riser with special bracketry.

	Bidder Complies	
	Yes	No

AUTO EJECT FOR SHORELINE

There shall be one (1) Kussmaul™, Model 091-55-20-120, 20 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 white 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(s) shall be connected to the battery charger.

There shall be a mating connector body supplied with the loose equipment.

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

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

The shoreline receptacle shall be located on the driver side exterior of cab, behind crew cab door.

ALTERNATOR

A Leece-Neville, Model 4962PA, 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, self-diagnostic regulator and rectifier. 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.

	Bidder Complies	
	Yes	No

- 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:

	Bidder Complies	
	Yes	No

- 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, rectangular LED lights mounted in the front quad style, chrome trim housing on each side of the cab grille:

- The outside light on each side shall contain a Model 8800-12V - DOT/ECE LB LED low beam module.
- The inside light on each side shall contain a Model 8800 -12V - DOT/ECE HB LED high beam module.

DIRECTIONAL LIGHTS

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

The color of the lenses shall be the same color as the LED's.

INTERMEDIATE LIGHT

There shall be two (2) Truck-Lite®, Model 60115Y, amber LED lights furnished, one (1) each side, horizontally in the rear fender panel. The light shall double as a turn signal and marker light.

A stainless steel trim shall be included with this installation.

ADDITIONAL DIRECTIONAL/MARKER LIGHT

There shall be one (1) pair(s) of Truck-Lite®, Model 60115Y, amber LED lights provided horizontal, one (1) each side located in the lower rear wheel well area. The light shall double as a turn signal and marker light.

A stainless steel trim shall be included with this installation.

CAB CLEARANCE/MARKER/ID LIGHTS

There shall be seven (7) amber LED lights provided to indicate the presence and overall width of the vehicle in the following locations:

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

	Bidder Complies	
	Yes	No

- Two (2) amber LED clearance lights shall be installed, one (1) on each outboard side of the cab above the windshield.
- Two (2) amber LED marker lights shall be installed, one (1) on each side above the cab doors.

REAR CLEARANCE/MARKER/ID LIGHTING

There shall be three (3) Truck-Lite®, Model 35200R, LED lights 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) Truck-Lite, Model 35200R, LED lights recessed 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) Truck-Lite, Model 35200R, LED lights recessed on the side of the apparatus 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

	Bidder Complies	
	Yes	No

the ground.

Per FMVSS 108 and CMVSS 108 requirements.

REAR FMVSS LIGHTING

There shall be the following stop/tail and directional lighting provided at the rear of the truck:

- Two (2) Whelen®, Model 60BTT*, red LED stop/tail lights with color lenses
- Two (2) Whelen, Model 60A00TAR, amber LED directional lights

The lights shall be mounted in a polished combination housing.

Two (2) Whelen Model 60C00VCR, LED backup lights shall be provided.

LICENSE PLATE BRACKET

There shall be one (1) license plate bracket mounted on the rear of the body.

A white LED light shall illuminate the license plate. A polished stainless steel light shield shall be provided over the light that shall direct illumination downward, preventing white light to the rear.

LIGHTING BEZEL

Two (2) Whelen, Model PLAST4V, four (4) light chrome plated composite plastic housings shall be provided for the rear stop/tail, directional, scene lights and warning.

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.

HEADLIGHT INTERLOCK

The headlights shall be interlocked to the parking brake. The interlock shall disable the headlights if they are "on" and the parking brake is set.

CAB PERIMETER SCENE LIGHTS

There shall be four (4) Truck-lite, Model 6060C, white LED lights with grommets 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.

	Bidder Complies	
	Yes	No

PUMP HOUSE PERIMETER LIGHTS

There shall be four (4) Truck-Lite, Model 6060C, 6.00" x 2.00" oval white LED lights with Model 60700, grommets provided.

The lights shall be mounted in the following locations:

- One (1) light shall be provided under the driver's side top mount pump panel access step
- One (1) light shall be provided under the driver's side pump panel running board
- One (1) light shall be provided under the passenger's side pump panel running board
- One (1) light shall be provided under the passenger's side top mount pump panel access step

The lights shall be controlled by the same means as the body perimeter lights.

BODY PERIMETER SCENE LIGHTS

There shall be two (2) Truck-Lite, Model 6060C, white LED lights with grommets provided under 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, the rear scene lights are activated, the driver's side directional is activated, activating only the driver side facing perimeter lights and the passenger's side directional is activated, activating only the passenger side facing perimeter lights.

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.

SCENE LIGHTS

There shall be two (2) Whelen®, Model 60C0ELZR, gradient LED scene light(s) with Model 6EFLANGE, chrome flange(s) installed on the side of the apparatus, one (1) each side high & rearward of the driver's side & passenger's side cab doors.

A control for the light(s) selected above shall be the following:

	Bidder Complies	
	Yes	No
• a switch at the driver's side switch panel • no additional switch location • opening the passenger's side cab or crew cab doors • opening the driver's side cab or crew cab doors These lights may be load managed when the parking brake is applied. **12 VOLT LIGHTING** There shall be one (1) Whelen Model PCP2P, 12 volt DC LED combination spot/floodlight(s) installed on the apparatus. The painted parts of this light assembly are to be white. The lights shall be installed PS above the top mount pump panel. The light(s) to be installed on a thru body/surface mount top adjust pull-up pole(s). The length of the outside pole is to be 20.00". The inside pole length to be 57.00" long or as long as practical to fit in the location selected. The light pole(s) to be installed without handle holder(s). The lights shall be controlled by the following: • a switch at the driver's side switch panel. • a switch at the pump operator's panel. • no additional switch location. • no additional switch location. These light(s) may be load managed when the parking brake is applied. **12 VOLT LIGHTING** There shall be one (1) Whelen Model PCP2P, 12 volt DC LED combination spot/floodlight(s) installed on the apparatus. The painted parts of this light assembly are to be white. The lights shall be installed on extendable poles DS above the top mount pump panel. The light(s) to be installed on a thru body/surface mount top adjust pull-up pole(s). The length of the outside pole is to be 20.00". The inside pole length to be 57.00" long or as long as practical to fit in the location selected.		

	Bidder Complies	
	Yes	No
The light pole(s) to be installed without handle holder(s). The lights shall be controlled by the following: • a switch at the driver's side switch panel. • a switch at the pump operator's panel. • no additional switch location. • no additional switch location. These light(s) may be load managed when the parking brake is applied. **12 VOLT LIGHTING** There shall be four (4) Whelen® Pioneer™ Series, Model PCP2*, 12 volt LED combination spotlight and floodlight(s) installed in semi-recessed housing(s) Model PBA203, located one (1) high and forward on driver's side body, one (1) high and rearward on driver's side body, one (1) high and forward on passenger's side body and one (1) high and rearward on passenger's side body. The painted parts of this light assembly are to be white. The light(s) selected above shall be controlled by the following: • a switch at the driver's side switch panel • a switch at the pump operator's panel • a switch at the passenger's side switch panel • no additional switch location These light(s) may be load managed when the parking brake is applied. **12 VOLT LIGHTING** There shall be one (1) Whelen® Pioneer™, Model PCP2*, 12 volt LED combination spot/flood light(s) provided on the front visor, centered. The painted parts of this light assembly are to be white. The light(s) shall be controlled by the following: • a switch at the driver's side switch panel • a switch at the passenger's side switch panel • no additional switch location These light(s) may be load managed when the parking brake is set.		

	Bidder Complies	
	Yes	No

LIGHTS BELOW HOSE BED COVER

There shall be four (4) Amdor LumaBar H2O, Model AY-9500-40, 40.00" white 12 volt DC LED light strips provided to illuminate the hose bed area.

- Two (2) LED light strips shall be installed on the driver's side hose bed cover 30.00" from the front and rear of the hose bed, as close to the hinge as practical.
- Two (2) LED light strips shall be installed on the passenger's side hose bed cover 30.00" from the front and rear of the hose bed, as close to the hinge as practical.

The light(s) shall be activated by a cup switch at the rear of the apparatus no more than 62.00" from the ground and when the hosebed cover is raised.

LIGHTS BELOW HOSE BED COVER

Installed below the aluminum hose bed cover shall be two (2) Amdor, Model LumaBar H2O, Model AY-9500-040, 40.00" long light stick(s). One (1) strip light shall be installed under the hosebed cover ons (1) side forward and one (1) side rearward on the edge of the reinforcing channel for each door, for protection of the light.

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

REAR SCENE LIGHT(S)

There shall be two (2) Fire Research, Model SPA900-Q70, LED scene light(s) with chrome trim bezels installed at the rear of the apparatus, one (1) each side on the rear as high as practical.

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

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

WALKING SURFACE LIGHT

There shall be Model FRP, 4" round black 12 volt DC LED floodlight with bolt mount provided to illuminate the entire designated walking surface on top of the body.

The light 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.

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

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

	Bidder Complies	
	Yes	No
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.		
A sump that is 8.00" long x 8.00" wide x 6.00" deep 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.		

	Bidder Complies	
	Yes	No
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.		
HOSE BED The hose bed shall be fabricated of .125"-5052 aluminum with a nominal 38,000 psi tensile strength.		
Standard hose bed width shall be 68.00" inside.		
Upper and rear edges of side panels shall have a double break for rigidity, a split tube finish shall not be acceptable.		
The upper inside area of the beavertails shall be covered with brushed stainless steel to prevent damage to painted surface when hose is removed.		
Flooring of the hose bed shall be removable aluminum grating with the top surface corrugated to aid in hose aeration. The grating slats shall be a minimum of 0.50" x 4.50" with spacing between slats for hose ventilation.		
Hose bed shall accommodate 200' of 2.50" left, 1000' of 5" center, 500' of 3"center, 200' of 2.50" right.		
HOSE BED DIVIDER Two (2) adjustable hosebed dividers shall be furnished for separating hose.		
Each divider shall be constructed of a .125" brushed aluminum sheet fitted and fastened into a slotted, 1.50" diameter radiused extrusion along the top, bottom, and rear edge.		
Divider shall be fully adjustable by sliding in tracks, located at the front and rear of the hose bed.		
Divider shall be held in place by tightening bolts, at each end.		
Acorn nuts shall be installed on all bolts in the hose bed which have exposed threads.		
HOSEBED RESTRAINT REAR The hose in the hosebed shall be restrained by 2.00" black nylon webbing with a 1.50" x 4.00" box pattern. The webbing shall be attached to the top hosebed frame with seat belt buckle fasteners. Web straps shall loop through the footman loops located on the rear body sheet below the hosebed. The straps shall be connected at the bottom with seat belt buckle fasteners.		
There shall be one (1) additional hose bed dividers furnished.		
Each divider shall be constructed of a .25" brushed aluminum sheet.		

	Bidder Complies	
	Yes	No
Partition shall be permanently installed and located one (1) each side of the hosebed outboard to divide the hard suction storage from the hosebed. Acorn nuts shall be installed on all bolts in the hosebed which have exposed threads. Flat surfaces shall be sanded for uniform appearance or constructed of brushed aluminum. The driver side hose bed side sheet shall be moved out to the far outside of the body compartment increasing the hose bed width. The visible seam between the body compartment and the hose bed side sheets shall be concealed with a chrome and black vinyl molding. The passenger side hose bed side sheet shall be moved out to the far outside of the body compartment increasing the hose bed width. The visible seam between the body compartment and the hose bed side sheets shall be concealed with a chrome and black vinyl molding. **HOSE BED COVER** 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 stationary bridgework support. The cover shall be constructed full width so that they cover the body compartments on both the driver and passenger side. The cover is designed with the left cover opening first. The cover shall be reinforced so that it can support the weight of a man walking on the cover. 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 gas filled cylinders shall be provided to assist in opening and closing the cover. A handrail is to be provided at the rear, in the center of the support, to assist in opening the cover. **GAS SHOCK AND CABLE FOR HOSE BED COVER** There shall be two (2) gas shocks and safety cables provided for the hosebed cover to provide additional support. **RUNNING BOARDS** Running boards shall be fabricated of .125" bright aluminum treadplate.		

	Bidder Complies	
	Yes	No
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 14.75" deep and spaced .50" away from the pump panel. The front and rear outside corner of the running board shall be finished with a 45 degree corner where it lines up with the body. A splashguard shall be provided above the running board treadplate. **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 24.00" deep in the center area and 8.00" deep to the rear of the side compartments. The tailboard shall be T-shaped. 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. Any inboard facing surfaces below the height of the hosebed shall be aluminum diamondplate . **TOW BAR** A tow bar shall be installed under the tailboard at center of truck. Tow bar shall be fabricated of 1.00" CRS bar rolled into a 3.00" radius. Tow bar assembly shall be constructed of .38" structural angle. When force is applied to the bar, it shall be transmitted to the frame rail. 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. Tow bar design shall have been fully tested and evaluated using strain gauge testing and finite element analysis techniques. **PAINT RUB RAIL** The rear and side rub rails shall be painted black.		

	Bidder Complies	
	Yes	No

RUNNING BOARD HOSE RESTRAINT

A pair of 2.00" wide black nylon straps with Velcro fasteners shall be provided for each hose tray to secure the hose during travel. There shall be Two (2) hose trays located one (1) in each side running board.

HOSE TRAY

Two (2) hose trays, free floating/push-up style, to fit in the opening of the running board shall be provided one (1) in each side running board.

Capacity of the tray shall be 100' of 1.50" hose.

Rubber matting and drain hole shall be installed on the floor of the tray to provide proper ventilation.

COMPARTMENTATION

Body and compartments shall be fabricated of .125", 5052-H32 aluminum.

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

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

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

The compartment door opening shall be framed by flanging the edges in 1.75" and bending out again .75" to form an angle.

Drip protection shall be provided above the doors by means of bright aluminum extrusion, formed bright aluminum treadplate or polished stainless steel.

The top of the compartment shall be covered with bright aluminum treadplate rolled over the edges on the front, rear and outward side. These covers shall have the corners welded.

Side compartment covers shall be separate from the compartment tops.

Front facing compartment walls shall be covered with bright aluminum treadplate.

All screws and bolts which protrude into a compartment shall have acorn nuts on the ends to prevent injury.

UNDERBODY SUPPORT SYSTEM

Due to the severe loading requirements of this pumper a method of body and compartment support suitable for the intended load shall be provided.

	Bidder Complies	
	Yes	No
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. The support system shall include .375" thick steel vertical angle supports bolted to the chassis frame rails with .625" diameter bolts. Attached to the bottom of the steel vertical angles shall be horizontal angles, with gussets welded to the vertical members, which extend to the outside edge of the body. A steel frame shall be mounted on the top of these supports to create a floating substructure which shall result in a 500 lb equipment support rating per lower compartment. 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 modified V 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, stress coating and strain gauging shall be performed with special attention given to fatigue, life and structural integrity of the cab, body and substructure. Body shall be tested while loaded to its greatest in-service weight. The criteria used during the testing procedure shall include:		

	Bidder Complies	
	Yes	No

- 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.

COMPARTMENTATION, DRIVER'S SIDE

A full height, rollup door compartment ahead of the rear wheels shall be provided. The interior dimensions of this compartment shall be 44.00" wide x 65.13" high x 25.75" deep in the lower 57.25" of the compartment and 15.63" deep in the remaining upper portion behind the roll-up door. The depth of the compartment shall be calculated with the compartment door closed. The compartment interior shall be fully open from the compartment ceiling to the compartment floor and designed so that no permanent dividers are required between the upper and lower sections. The clear door opening of this compartment shall be 38.25" wide x 57.25" high.

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

A rollup door compartment over the rear wheels shall be provided. The interior dimensions of this compartment shall be 66.50" wide x 31.38" high x 25.75" deep in the lower 25.38" of the compartment and 15.63" deep in the remaining upper portion. The depth of the compartment shall be calculated with the compartment door closed. The clear door opening of this compartment shall be 58.25" wide x 25.12" high.

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

A full height, rollup door compartment behind the rear wheels shall be provided. The interior dimensions of this compartment shall be 47.50" wide x 66.13" high x 25.75" deep in the lower 58.25" of the compartment and 15.63" deep in the remaining upper portion. The depth of the compartment shall be calculated with the compartment door closed. The compartment interior shall be fully open from the compartment ceiling to the compartment floor and designed so that no permanent dividers are required between the upper and lower sections. The clear door opening of this compartment shall be 44.75" wide x 58.25" high.

	Bidder Complies	
	Yes	No
Closing of the door shall not require releasing, unlocking, or unlatching any mechanism and shall easily be accomplished with one hand. **COMPARTMENTATION, PASSENGER'S SIDE** A full height, rollup door compartment ahead of the rear wheels shall be provided. The interior dimensions of this compartment shall be 44.00" wide x 58.25" high x 25.88" deep in the lower 26.00" of the compartment and 12.00" deep in the remaining upper portion. The height of the compartment shall be measured from the compartment floor to the bottom edge of the door roll. The depth of the compartment shall be calculated with the compartment door closed. The compartment interior shall be fully open from the compartment ceiling to the compartment floor and designed so that no permanent dividers are required between the upper and lower sections. The clear door opening of this compartment shall be 38.25" wide x 58.25" high. Closing of the door shall not require releasing, unlocking, or unlatching any mechanism and shall easily be accomplished with one hand. A rollup door compartment over the rear wheels shall be provided. The interior dimensions of this compartment shall be 66.50" wide x 25.38" high x 12.00" deep. The height of the compartment shall be measured from the compartment floor to the bottom edge of the door roll. The depth of the compartment shall be calculated with the compartment door closed. The clear door opening of this compartment shall be 58.25" wide x 25.12" high. Closing of the door shall not require releasing, unlocking, or unlatching any mechanism and shall easily be accomplished with one hand. A full height, rollup door compartment behind the rear wheels shall be provided. The interior dimensions of this compartment shall be 47.50" wide x 58.25" high x 25.88" deep in the lower 26.00" of the compartment and 12.00" deep in the remaining upper portion. The height of the compartment shall be measured from the compartment floor to the bottom edge of the door roll. The depth of the compartment shall be calculated with the compartment door closed.The compartment interior shall be fully open from the compartment ceiling to the compartment floor and designed so that no permanent dividers are required between the upper and lower sections. The clear door opening of this compartment shall be 44.75" wide x 58.25" high. Closing of the door shall not require releasing, unlocking, or unlatching any mechanism and shall easily be accomplished with one hand. **ROLLUP DOOR, SIDE COMPARTMENTS** There shall be six (6) compartment doors installed on the side compartments. The doors shall be double faced aluminum construction, an anodized satin finish.		

	Bidder Complies	
	Yes	No
Lath sections shall be an interlocking rib design and shall be individually replaceable without complete disassembly of door. Between each slat at the pivoting joint shall be a PVC inner seal to prevent metal to metal contact and prevent dirt or moisture from entering the compartments. Seals shall allow door to operate in extreme temperatures ranging from plus 180 to minus 40 degrees Fahrenheit. Side, top and bottom seals shall be provided to resist ingress of dirt and weather. All hinges, barrel clips and end pieces shall be nylon 66. All nylon components shall withstand temperatures from plus 300 to minus 40 degrees Fahrenheit. Hardened plastic shall not be acceptable. A polished stainless steel lift bar to be provided for each roll-up door. Lift bar shall be located at the bottom of door and have latches on the outer extrusion of the doors frame. A ledge shall be supplied over lift bar for additional area to aid in closing the door. Doors shall be constructed from an aluminum box section. The exterior surface of each slat shall be flat. The interior surfaces shall be concave to provide strength and prevent loose equipment from jamming the door from inside. To conserve space in the compartments, the spring roller assembly shall not exceed 3.00" in diameter. A garage style roll door shall not be acceptable. The header for the rollup door assembly shall not exceed 4.00". A heavy-duty magnetic switch shall be used for control of open compartment door warning lights. **COMPARTMENTATION, REAR** A rollup door compartment above the rear tailboard shall be provided. Interior dimensions of this compartment shall be 40.00" wide x 54.13" high x 25.88" deep in the lower 45.25" of height and 15.75" deep in the remaining upper portion. Depth of the compartment shall be calculated with the compartment door closed. For a chassis with a rear mounted fuel tank, a louvered removable access panel shall be furnished on the back wall of the compartment. Rear compartment shall be open into the rear side compartments. Clear door opening of this compartment shall be 33.25" wide x 45.25" high. Closing of the door shall not require releasing, unlocking, or unlatching any mechanism and shall easily be accomplished with one hand.		

	Bidder Complies	
	Yes	No

ROLLUP DOOR, REAR COMPARTMENT

There shall be a rear rollup door. The door shall be double faced aluminum construction, an anodized satin finish.

Lath sections shall be an interlocking rib design and shall be individually replaceable without complete disassembly of door.

Between each slat at the pivoting joint shall be a PVC inner seal to prevent metal to metal contact and prevent dirt or moisture from entering the compartments. Seals shall allow door to operate in extreme temperatures ranging from plus 180 to minus 40 degrees Fahrenheit. Side, top and bottom seals shall be provided to resist ingress of dirt and weather.

All hinges, barrel clips and end pieces shall be nylon 66. All nylon components shall withstand temperatures from plus 300 to minus 40 degrees Fahrenheit. Hardened plastic shall not be acceptable.

A polished stainless steel lift bar to be provided for each roll-up door. Lift bar shall be located at the bottom of door and have latches on the outer extrusion of the doors frame. A ledge shall be supplied over lift bar for additional area to aid in closing the door.

Door shall be constructed from an aluminum box section. The exterior surface of each slat shall be flat. The interior surface shall be concave to provide strength and prevent loose equipment from jamming the door from inside.

To conserve space in the compartments, the spring roller assembly shall not exceed 3.00" in diameter. A garage style roll door shall not be acceptable.

The header for the rollup door assembly shall not exceed 4.00".

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

DOOR GUARD

There shall be six (6) compartment doors that shall include a guard/drip pan designed to protect the roll-up door from damage when in the retracted position and contain any water spray. The guard shall be fabricated from stainless steel and installed on all body doors.

PULL STRAP, DOOR

There shall be six (6) compartment doors provided with pull straps. The compartment door(s) to be provided with a pull strap shall be D2, D3, D1, P1, P2 and P3.

	Bidder Complies	
	Yes	No

COMPARTMENT LIGHTING

There shall be seven (7) compartments with Amdor, Model AY-9220, white 12 volt DC LED compartment light strips. The lights shall be mounted with mechanical fasteners.

There shall be two (2) strip lights installed vertically in each compartment opening per the latest NFPA requirements.

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

MOUNTING TRACKS

There shall be four (4) sets of tracks for mounting shelf(s) in D1, R1, P1 and P3. These tracks shall be installed vertically to support the adjustable shelf(s), and shall be full height of the compartment. The tracks shall be painted to match the compartment interior.

ADJUSTABLE SHELVES

There shall be seven (7) 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 D1 in the lower third, in D1 centered between the floor and ceiling, in D1 in the upper third, in R1 in the upper third, in P1 in the lower third, in P1 in the upper third and in P3 in the upper third.

PERMANENT SHELVES

There shall be one (1) shelf with a capacity of 215 lb provided. The shelf construction shall consist of .188" aluminum with 2.00" sides. Each shelf shall be painted to match the compartment interior. The dimensions of the shelf shall be the space available to the right of the cord reel in R1.

The shelves shall be held in place by .12" thick stamped plated brackets and bolts.

The location shall be to the right of and attached to the cord reel bracket in R1.

SLIDE-OUT ADJUSTABLE HEIGHT TRAY

There shall be two (2) slide-out trays provided.

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

	Bidder Complies	
	Yes	No
Each tray shall be constructed of aluminum painted spatter gray. Each tray shall be mounted on a pair of side mounted slides. The slide mechanisms shall have ball bearings for ease of operation and years of dependable service. The slides shall be mounted to shelf tracks to allow the tray to be adjustable up and down within the designated mounting location. An automatic lock shall be provided for both the in and out tray positions. The lock trip mechanism shall be located at the front of the tray and shall be easily operated with a gloved hand. The location(s) shall be in D1 in the upper third and in D3 in the upper third **SLIDE-OUT/TILT-DOWN TRAY** There shall be two (2) slide-out trays provided. The bottom of each tray shall be constructed of 0.188" thick aluminum painted spatter gray while special aluminum extrusions shall be utilized for the tray sides, ends, and tracks. The corners shall be welded to form a rigid unit. A spring loaded lock shall be provided on each side at the front of the tray. Releasing the locks shall allow the tray to slide out approximately two-thirds (2/3) of its length from the stowed position and tip 30 degrees down from horizontal. The tray shall be equipped with ball bearing rollers for smooth operation. Rubber padded stops shall be provided for the tray in both the stowed and extended positions. The capacity rating of the tray shall be a minimum of 215 lb in the extended position. The vertical position of the tray within the compartment shall be adjustable. The location(s) shall be in D2 in the upper third and in D3 in the upper third. **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 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 D1, P1, D3, P3 and R1. **SLIDE-OUT FLOOR MOUNTED TRAY** There shall be one (1) floor mounted slide-out tray(s) with 2.00" sides provided R1. Each tray shall be rated for up to 500lb in the extended position. The tray(s) shall be constructed of a minimum .13" aluminum with welded corners. The finish shall be painted to match compartment interior. The trays shall be designed for maximum compartment width and depth. There shall be two roller bearing type slides rated at 250lb each provided. The pair of slides shall have a safety factor rating of 2. To ensure years of dependable service, the slides shall be coated with a finish that is tested to withstand a minimum of 1,000 hours of salt spray per ASTM B117. To ensure years of easy operation, the slides shall require no more than a 50lb force for push-in or pull-out movement when fully loaded after having been subjected to a 40 hour vibration (shaker) test under full load. The vibration drive file shall have been generated from accelerometer data collected from a heavy truck chassis driven over rough gravel roads in an unloaded condition. Proof of compliance shall be provided upon request. Automatic locks shall be provided for both the "in" and "out" positions. The trip mechanism for the locks shall be located at the front of the tray for ease of use with a gloved hand. **SWING OUT TOOLBOARD** A swing out aluminum toolboard shall be provided. It shall be a minimum of .188" thick with .20" diameter holes in a pegboard pattern with 1.00" centers between holes.		

	Bidder Complies	
	Yes	No

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 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 painted spatter gray to match compartment interior and installed P2.

VERTICAL COMPARTMENT PARTITION

One (1) partition shall be provided.

The partition construction shall consist of .125" aluminum painted spatter gray. Each partition shall be the full vertical height of the compartment.

The location(s) shall be in D3, 28.00" from the forward door frame.

RUB RAIL

Bottom edge of the side compartments shall be trimmed with a black aluminum extruded rub rail.

Trim shall be 2.12" high with 1.38" flanges turned outward for rigidity.

The rub rails shall not be an integral part of the body construction, which allows replacement in the event of damage.

BODY FENDER CROWNS

Rubber fender crowns shall be provided around the rear wheel openings.

Crowns shall be black.

HANDRAILS

The handrails shall be 1.25" diameter anodized aluminum extrusion, with a ribbed design, to provide a positive gripping surface.

Chrome plated end stanchions shall support the handrail. Plastic gaskets shall be used between end stanchions and any painted surfaces.

Drain holes shall be provided in the bottom of all vertically mounted handrails.

	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, not less than 29.00" long, shall be located on each rear beavertail.

- One (1) full width horizontal handrail shall be provided below the hose bed at the rear of the apparatus.

AIR BOTTLE STORAGE (DOUBLE)

A total of two (2) air bottle compartments shall be provided. The air bottle compartment(s) shall be located PS forward and rearward of the rear wheels. Each air bottle compartment shall be of adequate size to accommodate two (2) air bottles. Flooring shall be rubber lined and be furnished with a drain hole. A brushed stainless steel, full width door with a chrome-plated latch shall be provided to contain the air bottles. A dielectric barrier shall be provided between the door hinge, hinge fasteners and the body sheet metal.

EXTINGUISHER STORAGE

A total of one (1) extinguisher compartments shall be provided. drivers side rearward of the rear wheels. The extinguisher compartment shall be in the form of a square tube (8.25" minimum) and of adequate depth to accommodate different size extinguishers. Flooring shall be rubber lined and have a drain hole. A stainless steel door with a chrome plated latch shall be provided to contain the air bottle. A dielectric barrier shall be provided between the door hinge, hinge fasteners (screws) and the body sheet metal.

EXTENSION LADDER

There shall be a 24' two-section aluminum Duo-Safety Series 900-A extension ladder provided.

ROOF LADDER

There shall be one (1) 14' aluminum, Duo-Safety, Series 775-DR roof ladder(s) provided. The ladder(s) shall have roof hooks on both ends.

LADDER STORAGE

The ladders shall be stored between the water tank and the passenger's 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 black rubber boot shall be provided to enclosed the ladders in the gap between the pump house and the body.

	Bidder Complies	
	Yes	No

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

A bright aluminum treadplate 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 D-handle latch to access the ladders.

FOLDING LADDER

One (1) 10.00' aluminum, Series 585-A, Duo-Safety folding ladder shall be installed in a U-shaped trough inside the ladder storage compartment.

LADDER STORAGE AREA LIGHT

There shall be two (2) Truck-Lite, Model 44308C, 4.00" round white LED lights with Model 40700, rubber grommets provided in place of the standard halogen lights in ladder rack storage area.

PIKE POLE STORAGE

Aluminum tubing shall be used for the storage of two (2) pike poles and shall be located in the ladder storage area. If the head of a pike pole can come in contact with a painted surface, a stainless steel scuffplate shall be provided. The pike pole tube shall be notched to allow a New York style pike pole to fit into the tube.

STEPS

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

REAR FOLDING STEPS

Bright finished, non-skid folding steps with a black coating 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.

Three (3) additional folding steps shall be located one (1) on the driver side rear bulkhead and two (2) on the passenger side rear bulkhead. The step(s) shall be bright finished, non-skid with a black coating. Each step shall incorporate an LED light to illuminate the stepping surface. The step(s) can be used as a hand hold with two openings wide enough for a gloved hand.

PUMP

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

	Bidder Complies	
	Yes	No
Pump shall be the class "A" type. Pump shall deliver the percentage of rated discharge at pressures indicated below: - 100% of rated capacity at 150 psi net pump pressure. -70% of rated capacity at 200 psi net pump pressure. -50% of rated capacity at 250 psi net pump pressure. Pump body shall be close-grained gray iron, bronze fitted, and horizontally split in two (2) sections for easy removal of the entire impeller shaft assembly (including wear rings). Pump shall be designed for complete servicing from the bottom of the truck, without disturbing the pump setting or apparatus piping. Pump case halves shall be bolted together on a single horizontal face to minimize chance of leakage and facilitate ease of reassembly. No end flanges shall be used. Discharge manifold of the pump shall be cast as an integral part of the pump body assembly and shall provide a minimum of three (3) 3.50" openings for flexibility in providing various discharge outlets for maximum efficiency. The three (3) 3.50" openings shall be located as follows: one (1) outlet to the right of the pump, one (1) outlet to the left of the pump, and one (1) outlet directly on top of the discharge manifold. Impeller shaft shall be stainless steel, accurately ground to size. It shall be supported at each end by sealed, anti-friction ball bearings for rigid precise support. Impeller shall have flame plated hubs assuring maximum pump life and efficiency despite any presence of abrasive matter in the water supply. Bearings shall be protected from water and sediment by suitable stuffing boxes, flinger rings, and oil seals. No special or sleeve type bearings shall be used. Stuffing boxes shall be of the conventional two (2) piece, split-gland type, to permit adjustment or replacement of Grafoil packing without disturbing the pump. Water shall be fed into stuffing box lantern rings for proper lubrication and cooling when the pump is operating. Lantern rings shall be located at the inner ends of the stuffing boxes, to avoid having to remove them when replacing pump packing. 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.		

	Bidder Complies	
	Yes	No

PUMP TRANSMISSION

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.

Drive shafts shall be a minimum of 2.35" diameter hardened and ground alloy steel. All shafts shall be ball bearing supported. The case shall be designed as 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.

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".

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

The pump shift 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. Heat exchanger shall be cylindrical type and shall be a separate unit. It shall be installed in the pump or engine compartment with the control located on the pump operator's control panel. Exchanger shall be plumbed to the master drain valve.

	Bidder Complies	
	Yes	No

INTAKE RELIEF VALVE

An Akron relief valve shall be installed on the suction side of the pump preset at 125 psig.

Relief valve shall have a working range of 75 psig to 200 psig.

Outlet shall terminate below the frame rails with a 2.50" National Standard hose thread adapter and shall have a "do not cap" warning tag.

Control shall be located behind an access door at the right (passenger's) side pump panel.

PRESSURE CONTROLLER

A Pressure Governor shall be provided. An electric pressure governor shall be provided which is capable of automatically maintaining a desired preset discharge pressure in the water pump. When operating in the pressure control mode, the system shall automatically maintain the discharge pressure set by the operator (within the discharge capabilities of the pump and water supply) regardless of flow, within the discharge capacities of the water pump and water supply.

A pressure transducer shall be installed in the water discharge of the pump. The transducer continuously monitors pump pressure sending a signal to the Electronic Control Module (ECM).

The governor can be used in two (2) modes of operation, RPM mode and pressure modes.

In the RPM mode, the governor can be activated after vehicle parking brake has been set.When in this mode, the governor shall maintain the set engine speed, regardless of engine load (within engine operation capabilities).

In the pressure mode, the governor system can only operate after the fire pump has been engaged and the vehicle parking brake has been set. When in the pressure mode, the pressure controller monitors the pump pressure and varies engine speed to maintain a precise pump pressure. The pressure controller shall use a quicker reacting J1939 database for engine control.

A preset feature allows a predetermined pressure or rpm to be set.

A pump cavitation protection feature is also provided which shall return the engine to idle should the pump cavitate. Cavitation is sensed by the combination of pump pressure below 30 psi and engine speed above 2000 rpm for more than five (5) seconds.

The throttle shall be a vernier style control, with a large control knob for use with a gloved hand. A throttle ready light shall be provided adjacent to the throttle control. A large 0.75" RPM display shall be provided to be visible at a glance.

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

Large 0.75" push buttons shall be provided for menu, mode, preset, and silence selections.

	Bidder Complies	
	Yes	No
The water tank level indicator shall be incorporated in the pressure governor. A fuel level indicator shall be incorporated in the pressure controller. A pump hour meter shall be incorporated in the pressure controller. The pressure controller shall incorporate monitoring for engine temperature, oil pressure, fuel level alarm, and voltage. Pump monitoring shall include, pump gearcase temperature, error codes, diagnostic data, pump service reminders, and time stamped data logging, to allow for fast accurate trouble shooting. It shall also notify the driver/engineer of any problems with the engine and the apparatus. Complete understandable messages shall be provided in a 20-character display, providing for fewer abbreviations in the messages. An automatic dim feature shall be included for night operations. The pressure controller shall include a USB port for easy software upgrades, which can be downloaded through a USB memory stick, eliminating the need for a laptop for software installations. A complete interactive manual shall be provided with the pressure controller. **PRIMING PUMP** The priming pump shall be a Trident 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. **PUMP MANUALS** There shall be a total of two (2) pump manuals provided by the pump manufacturer and furnished with the apparatus. The manuals shall be provided by the pump manufacturer in the form of two (2) CDs. Each manual shall cover pump operation, maintenance, and parts. **PLUMBING, 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.		

	Bidder Complies	
	Yes	No

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.

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.

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).

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.

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.

RIGHT SIDE INLET

There shall be one (1) auxiliary inlet with a 2.50" valve at the right 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.

Inlet valve location shall be behind the pump panel.

	Bidder Complies	
	Yes	No

INLET CONTROL

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

There shall be two (2) inlets.

INLET BLEEDER VALVE

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

TANK TO PUMP

The booster tank shall be connected to the intake side of the pump with heavy duty 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 2.00" combination tank refill and pump re-circulation line shall be provided, using a quarter-turn full flow ball valve controlled from the pump operator's panel.

LEFT SIDE DISCHARGE OUTLETS

There shall be two (2) discharge outlets with a 2.50" valve on the left side of the apparatus, terminating with a 2.50" (M) National Standard hose thread adapter.

RIGHT SIDE DISCHARGE OUTLETS

There shall be two (2) discharge outlets with a 2.50" valve on the right side of the apparatus, terminating with a 2.50" (M) National Standard hose thread adapter.

LARGE DIAMETER DISCHARGE OUTLET

There shall be a 4.00" discharge outlet with a 4.00" Akron valve installed on the right side of the apparatus, terminating with a 4.00" (M) National Standard hose thread.

	Bidder Complies	
	Yes	No

There shall be an Akron electric valve controllers provided at the pump panel. The controller unit shall be of true position feedback design, requiring no clutches in the motor or current limiting. The controller shall be completely sealed with two (2) button open and close valve position capability and a full color LCD display with backlight.

FRONT DISCHARGE OUTLET

There shall be one (1) 1.50" discharge outlet piped to the front of the apparatus and located on the top of the right side of the front bumper.

Plumbing shall consist of 2.00" piping and flexible hose with a 2.00" ball 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 Class 1 automatic drains provided at all low points of the piping.

FRONT OF HOSE BED DISCHARGE OUTLET

There shall be two (2) discharge outlets discharge(s) piped to the front of the hose bed and located one (1) each side. Plumbing shall consist of 2.50" piping with a 2.50" full-flow ball valve controlled at the pump operator's panel. The discharge(s) shall terminate with a 2.50" (M) National Standard hose thread adapter.

DISCHARGE CAPS

Chrome plated, rocker lug, caps with chains shall be furnished for all side discharge outlets.

The caps 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 swing style handle control extended to the outside of the side pump panel. The handles shall be chrome plated and provide a visual indication of valve position. The swing handle shall provide an ergonomic position for operating the valve without twisting the wrist and provides excellent leverage. Bleeders shall be located at the bottom of the pump panel. They shall be properly labeled identifying the discharge they are plumbed in to. The water discharged by the bleeders shall be routed below the chassis frame rails.

	Bidder Complies	
	Yes	No

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).

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).

LARGE DIAMETER OUTLET ELBOWS

The 4.00" outlet(s) shall be furnished with one (1) 4.00" (F) National Standard hose thread x 5.00" Storz elbow adapter with Storz cap.

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.

DELUGE RISER

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

The outlet flange for the monitor shall be high enough to allow the monitor to be rotated without interference with any other items in the area.

The deluge riser shall have male National Pipe Threads for mounting the monitor.

SPEEDLAYS

Ahead of the pump enclosure shall be two (2) 1.75" and one (1) 2.5" speedlay hose beds. Two (2) speedlay compartments shall have a 2.00" preconnect line with a 2.00" quarter turn ball valve and terminate with a 1.50" National Standard hose thread 90 degree swivel. One (1) speedlay compartment shall have a 2.5" preconnect with a 2.5" quarter turn ball valve and terminate with a 2.5" National Standard hose thread 90 degree swivel.

	Bidder Complies	
	Yes	No

Individual controls for the speedlays shall be at the pump operator's panel.

Two (2) compartments shall be capable of carrying 200 feet of 1.75" double jacketed hose. One compartment shall be capable of carrying 200 feet of 2.5" double jacketed hose with the one (1) compartment located above the other.

Scuffplates shall be provided at the sides and bottom of each opening on both sides.

Speedlay flooring shall consist of removable perforated brushed aluminum.

SPEEDLAY HOSE RESTRAINT

A black 1.00" nylon webbing design with 2.00" box pattern shall be provided across each end of two (2) speedlay(s) to secure the hose during travel. The webbing shall be permanently attached at the bottom of the speedlay opening. 1.00" web straps shall loop through footman loops located at the opposite end of the permanently attached webbing. The straps shall attach with spring clip and hook fasteners.

BOOSTER HOSE REEL

A Hannay electric rewind booster hose reel shall be installed over the pump in a recessed open compartment on the right side of the apparatus.

The exterior finish of the reel shall be painted job color matching the body exterior.

A polished stainless steel roller and guide assembly shall be mounted on the reel side of the apparatus.

Discharge control shall be provided at the pump operator's panel. Plumbing to the reel shall consist of 1.50" Aeroquip hose and a 1.50" valve.

Reel motor shall be protected from overload with a circuit breaker rated to match the motor.

An electric rewind control switch shall be installed on the reel side pump panel.

Booster hose, 1.00" diameter and 150 feet, with chrome plated Barway, or equal couplings shall be provided.

Working pressure of the booster hose shall be a minimum of 800 psi.

Capacity of the hose reel shall be 150 feet of 1.00" booster hose.

There shall be two (2) additional polished stainless steel roller and guide assembly mounted DS and on top above the generator.

	Bidder Complies	
	Yes	No

FOAM PROPORTIONER

A foam proportioning system shall be provided that is an on demand, automatic proportioning, single point, direct injection system suitable for all types of Class A and B foam concentrates, including the high viscosity (6000 cps), alcohol resistant Class B foams. Operation shall be based on direct measurement of water flow, and remain consistent within the specified flows and pressures. The system shall automatically balance and proportion foam solution at rates from .1 percent to 9.9 percent regardless of variations in water pressure and flow, up to the maximum rated capacity of the foam concentrate pump.

The design of the system shall allow operation from draft, hydrant, or relay operation. This shall provide a versatile system to meet the demands at a fire scene.

SYSTEM CAPACITY

The system shall have the ability to deliver the following minimum foam solution flow rates that meet or exceed NFPA requirements at a pump rating of 250 psi.

200 gpm @ 6 percent

400 gpm @ 3 percent

1200 gpm @ 1 percent

The foam concentrate setting may be adjusted in .1 percent increments from .1 percent to 9.9 percent. Typical settings are .3 percent, .5 percent and 1.0 percent (The maximum capacity will be limited to the plumbing and water pump capacity).

CONTROL SYSTEM

The system shall be equipped with a digital electronic control display located on the pump operators panel. Push button controls shall be integrated into the panel to turn the system on/off, control the foam percentage, direct which foam to use on a multi-tank system, and to set the operation modes (automatic, manual, draft, calibration, or flush).

The percent of injection shall have presets for Class A or Class B foam. These presets can be changed at the fire department as desired. The percent of injection shall be able to be easily changed at the scene to adjust to changing demands.

In order to minimize the use of abbreviations and interpretations, system information shall be displayed on the panel by way of .50 tall LEDs that total 14 characters (two (2) lines of seven (7) each). System on and foam pump on indicator lights shall also be included. Information displayed shall include mode of operation (automatic, manual, draft, calibration, or flush), foam supply selected (Class A or Class B), water total, foam total, foam percentage, remaining gallons, and time remaining.

	Bidder Complies	
	Yes	No
The control display shall direct a microprocessor, which receives input from the systems water flow meter while also monitoring the position of the foam concentrate pump. The microprocessor shall compare the values of the water flow versus the position/rate of the foam pump, to ensure the proportion rate is accurate. One (1) check valve shall be installed in the plumbing to prevent foam from contaminating the water pump. **LOW LEVEL,FOAM TANK** The control head shall display a warning message when the foam tank in use is below a quarter tank. **HYDRAULIC DRIVE SYSTEM** The foam concentrate pump shall be powered by a hydraulic drive system, which is automatically activated, whenever the vehicle water pump is engaged. A system that drives the foam pump via an electric motor shall not be acceptable. A large parasitic electric load used to power the foam pump can cause an overload of the chassis electrical system. Hydraulic oil cooler shall be provided to automatically prevent overheating of the hydraulic oil, which is detrimental to system components. The oil/water cooler shall be designed to allow continuous system operation without allowing hydraulic oil temperature to exceed the oil specifications. The hydraulic oil reservoir shall be of four (4) gallons minimum capacity and shall also be of sufficient size to minimize foaming and be located to facilitate checking oil level or adding oil without spillage or the need to remove access panels. **FOAM CONCENTRATE PUMP** The foam concentrate pump shall be of positive displacement, self-priming; linear actuated design, driven by the hydraulic motor. The pump shall be constructed of brass body; chrome plated stainless steel shaft, with a stainless steel piston. In order to increase longevity of the pump, no aluminum shall be present in its construction. A relief system shall be provided which is designed to protect the drive system components and prevent over pressuring the foam concentrate pump The foam concentrate pump shall have minimum capacity for 12 gpm with all types of foam concentrates with a viscosity at or below 6000 cps including protein, fluoroprotein, AFFF, FFFP, or AR-AFFF. The system shall deliver only the amount of foam concentrate flow required, without recirculating foam back to the storage tank. Recirculating foam concentrate back to the storage tank can cause agitation and premature foaming of the concentrate, which can result in system failure. The foam concentrate pump shall be self-priming and have the ability to draw foam concentrate from external supplies such as drums or pails.		

	Bidder Complies	
	Yes	No

EXTERNAL FOAM CONCENTRATE CONNECTION

An external foam pick-up shall be provided to enable use of a foam agent that is not stored on the vehicle. The external foam pick-up shall be designed to allow continued operation after the on-board foam tank is empty. The external foam pick-up shall be designed to allow use with training foam or colored water for training purposes.

PANEL MOUNTED STRAINER / EXTERNAL PICK-UP CONNECTION

A bronze body strainer / connector unit shall be provided. The unit shall be mounted to the pump panel. The external foam pick-up shall be one (1) 1.00" male connection with chrome-plated cap integrated to a 2.00" strainer cleanout cap. A check valve shall be installed in the pick-up portion of the cleanout cap. A basket style stainless steel screen shall be installed in the body of the strainer / connector unit. Removal of the 2.00" cleanout cap shall be all that is required to gain access to and remove the stainless steel basket screen. The strainer / connector unit shall be ahead of the foam concentrate pump inlet port to insure that all agents reaching the foam pump has been strained.

PICK-UP HOSE

A 1.00" flexible hose with an end for insertion into foam containers shall be provided. The hose shall be supplied with a 1.00" female swivel NST thread swivel connector. The hose shall be shipped loose.

DISCHARGES

The foam system shall be plumbed to five (5) discharges. The discharges capable of dispensing foam shall be speedlays, front discharge, and booster reel.

SYSTEM ELECTRICAL LOAD

The foam proportioning shall not impose an electrical load on the vehicle electrical system any greater than five (5) amps at 12VDC.

FOAM SUPPLY VALVE

An electric valve shall be used for the foam supply valve. The foam supply valve shall be controlled at the foam system control head for ease of operation. The supply valve shall be electric, remote controlled, to eliminate air pockets in the foam tank supply hose.

MAINTENANCE MESSAGE

A message shall be displayed on the control head to advise when system maintenance needs to be performed. The message shall display interval for cleaning the foam strainer, cleaning for the water strainers, and changing the hydraulic oil.

	Bidder Complies	
	Yes	No

FLUSH SYSTEM

The system shall be designed such that a flush mode shall be provided to allow the system to flush all foam concentrate with clear water. The flush circuit control logic shall ensure the foam tank supply valve is closed prior to opening the flush valve. The flush valve shall be operated at the foam system control head for ease of operation. The valve shall be electrically controlled and located as close to the foam tank supply valve as possible. A manual flush drain valve shall be labeled and located under the driver's side running board.

SINGLE FOAM TANK REFILL

The foam system's proportioning pump shall be used to fill the Class A foam tank. This shall allow use of the auxiliary foam pick-up to pump the foam from pails or a drum on the ground into the foam tank. A foam shut-off switch shall be installed in the fill dome of the tank to shut the system down when the tank is full. The fill operation shall be controlled by a mode in the foam system controller stating TANK FILL. While the proportioner pump is filling the tank, the controller shall display FILL TANK. When the tank is full, as determined by the float switch in the tank dome, the pump shall stop and the controller shall display TANK FULL.

RELOCATE HYDRAULIC RESERVOIR

Relocate the foam system hydraulic reservoir to behind an access door on the driver's side pump panel.

To facilitate ease of refilling, tank to be mounted as low as possible.

FOAM TANK

The foam tank shall be an integral portion of the polypropylene water tank. The cell shall have a capacity of 30 gallons of foam with the intended use of Class A foam. The foam cell shall not reduce the capacity of the water tank. The foam cell shall have a screen in the fill dome and a breather in the lid.

FOAM TANK DRAIN

A system of 1.00" foam tank drains shall be provided, integrated into the foam systems strainer and tank to foam pump valve management system.The tank to pump hoses running from the tank(s) to the panel mounted strainer shall 1.00" diameter.The foam system controller shall have a mode that allows for a given foam valve to be opened at will. Flow of foam from the tank valve to the strainer shall be usable as a tank drain mode.

An adaptor shall be supplied, that allows the 1.00" foam intake screen to assembly to be used as a drain outlet. The standard supplied 1.00" foam pick up hose shall be attached to the screen assembly by way of the adapter. The drain mode shall allow the operator to open and close the tank valve as required from the control head, to drain foam and re-fill foam containers through the connected hose, without foam spillage beneath the vehicle.

	Bidder Complies	
	Yes	No

PUMP COMPARTMENT

The pump compartment shall be separate from the hose body and compartments so that each may flex independently of the other. It shall be a fabricated assembly of steel tubing, angles and channels which support both the fire pump and the side running boards.

Compartment shall be mounted on chassis frame rails with rubber isolators in a four point pattern to allow for chassis frame twist.

Pump compartment, pump, plumbing and gauge panels must be removable from the chassis as 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.

TOP MOUNT PUMP CONTROL PANELS

All pump controls and gauges to be properly marked and located above the pump to the rear of the walkway. Operator to face the rear of the truck when viewing the control panel from the operating position.

The control panel shall be in two planes.

Both planes to be full width of the pump house.

The upper plane shall contain the pump master gauges, engine monitoring gauges, electrical switches, and foam controls (if applicable). The upper plane shall be hinged at the bottom with a full length stainless steel hinge. The fasteners used to hold the panel in the upright position shall be quarter turn type. Vinyl covered cable or chains shall be used to hold the gauge panel in the dropped position.

The lower plane is to contain all the line pressure gauges and valve control rods. The line pressure gauge shall be mounted directly below the corresponding discharge control handle and recessed within the same chrome plated casting for quick identification. All outlet and inlet controls shall be the lever type with direct linkage utilizing bell cranks and universal swivels to the valve itself. The control levers shall be made of a 0.62" (minimum) stainless steel rod.

The gauge and valve control bezels shall be removable from the face of the pump panel for ease of maintenance.

	Bidder Complies	
	Yes	No

IDENTIFICATION TAGS

Identification tags for the discharge controls shall be recessed within the same bezel. The discharge identification tags shall be color coded, with each discharge having its own unique color.

All remaining identification tags shall be mounted on the pump panel in chrome plated bezels.

The side pump panels shall be easily removable for ease of maintenance.

Polished stainless steel trim collars to be installed around all inlets and outlets.

WALKWAY

A 19.00" wide walkway shall be provided for access to the top control panel. The walkway shall be constructed of bright aluminum treadplate and properly reinforced.

There shall be Ri-Tar, Model M27-HW2 LED lights provided on the back of the cab to illuminate the walkway. The lights shall come on with the body perimeter lights.

WALKWAY TOOL COMPARTMENT

A tool compartment shall be provided on each side of the walkway. Each compartment shall have an aluminum treadplate door and shall be equipped with two (2) white LED lights with chrome bezels, one (1) in each compartment.

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 side control panels shall be constructed of aluminum with a black Line-X® spray-on polyurethane/polyurea material finish. A polished aluminum trim molding shall be provided around each panel.

The gauge and top mount control panels shall be constructed of aluminum with a black Line-X® spray-on polyurethane/polyurea material finish. A polished aluminum trim molding shall be provided around each panel.

The gauge panel shall be hinged at the bottom with a full length stainless steel hinge. The fasteners that hold the panel in the upright position shall be quarter-turn style. Vinyl covered chains shall be used to hold the panel in the dropped position.

The driver's and passenger's side pump panels shall be removable and fastened with swell type fasteners.

	Bidder Complies	
	Yes	No

PUMP COMPARTMENT LIGHT

A pump compartment light shall be provided inside the right side pump enclosure and accessible through a door on the pump panel.

A .125" weep hole shall be provided in each light lens, preventing moisture retention.

Engine monitoring graduated LED indicators shall be incorporated with the pressure controller.

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 button shall be located within easy reach of the operator in the electrical switch panel.

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#.

	Bidder Complies	
	Yes	No

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

An electric water level gauge shall be incorporated in the pressure controller that registers water level by means of 9 LEDs. They shall be at 1/8 level increments with a tank empty LED. The LEDs shall be a bright type that is readable in sunlight, and have a full 180-degree of clear viewing.

To further alert the pump operator, the gauge shall have a warning flash when the tank volume is less than 25%, and shall have "Down Chasing LEDs when the tank is almost empty.

The level measurement shall be ascertained by sensing the head pressure of the fluid in the tank or cell.

WATER LEVEL GAUGE

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

This light module 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

This module shall be activated when the 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

	Bidder Complies	
	Yes	No

- 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 one (1) 16 gauge stainless steel light shield installed over the operator's panel.

- This light shield shall include On Scene Solutions, Model Night Axe, LED strip 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.
- One (1) pump panel light shall come on when the pump is in OK to pump mode. The remaining lights to be actuated from a switch located on the pump panel.

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

A green pump engaged indicator light shall come on at the operator's panel when the pump is shifted into gear from inside the cab.

MICROPHONE & SPEAKER COMPARTMENT

A microphone and speaker compartment, with a polished, stainless steel door shall be furnished, recessed in the upper plane at the pump operator's panel. Compartment size shall be TBD.

AIR HORN SYSTEM

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

Air Horn Location

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

	Bidder Complies	
	Yes	No

AIR HORN CONTROL

The air horns shall be actuated by a foot switch on the officer's side 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 Code 3®, Model 3692, electronic siren with noise canceling microphone shall be provided.

This siren is to be active when the battery switch is on and the emergency master switch is on.

Electronic siren head shall be recessed in the overhead console above the engine tunnel on the driver side.

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) speaker, Code 3®, Model PB100C, with chrome finish provided. Connection shall be connected to the siren amplifier.

The speaker(s) shall be recessed in the front bumper on the passenger's side.

AUXILIARY MECHANICAL SIREN

A Federal Q2B® siren shall be furnished. A siren brake button shall be installed on the switch panel.

The control solenoid shall be powered up after the emergency master switch is activated.

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

The mechanical siren shall be actuated by two (2) foot switches, one (1) located on the officer's side and one (1) on the driver's side.

FRONT ZONE UPPER WARNING LIGHTS

There shall be one (1) 72.00" 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.

	Bidder Complies	
	Yes	No

- One (1) white 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) 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 fifth front position.
- One (1) red flashing LED module in the passenger's side fourth front position.
- One (1) white 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 clear lenses.

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 with the emergency master switch only.
- No momentary switch to activate the traffic light controller.

The two (2) white flashing LED modules and the traffic light controller shall be disabled when the parking brake is applied.

The eight (8) red flashing LED modules in the front positions may be load managed when the parking brake is applied.

WARNING LIGHTS (CAB FACE)

Two (2) pair of Whelen model 60*02F*R LED lights shall be installed on the cab face, above the headlights in a two (2) light bezel.

The outer LEDs shall be required for NFPA and shall meet or exceed the NFPA required light output for the front lower zone. The color of these LEDs shall be red Super LED/red lens.

The inner LEDs shall be additional lighting. The color of these lights shall be red Super LED/red lens.

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

FRONT WARNING LIGHT

There shall be one (1) pair of Whelen, Model 60*02F*R, LED flashing lights shall be provided, one (1) each side on the angle corners of the front bumper.

	Bidder Complies	
	Yes	No

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

These lights shall be activated by with the front warning switch.

These lights shall be provided with a flange.

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

Any amber light shall be activated only when the parking brake is applied.

SIDE ZONE LOWER LIGHTING

There shall be six (6) Whelen®, Model 60*02F*R, flashing LED lights installed per the following:

- Two (2) lights located, one (1) each side on the bumper extension. The side front lights to include red LEDs with red lenses.
- Two (2) lights located, one (1) each side of cab rearward of crew cab doors. The middle lights to include red LEDs with red lenses.
- Two (2) lights located, one (1) each side above rear wheels. The rear lights to include red LEDs with red lenses.
- These lights shall be installed with three (3) pairs of flange kits.

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

SIDE WARNING LIGHTS

There shall be one (1) pair of flush mounted Whelen, Model 90**5F*R flashing LED lights provided.

The lights shall be located on one (1) each side on the upper body as far forward as possible.

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

The lights shall be controlled by with the side warning switch.

These lights shall be installed with a flange.

REAR ZONE LOWER LIGHTING

There shall be two (2) Whelen®, Model 60*02F*R, red Super LED/red lens lights located at the rear of the apparatus.

Each light shall be mounted in a housing.

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

	Bidder Complies	
	Yes	No

REAR WARNING LIGHTS

There shall be one (1) pair of Whelen®, Model 60*02F*R, flashing Super LED lights provided.

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

These lights shall be located at the rear of the body, each side high on rear compartment bulkheads, and activated with the rear upper warning switch

These lights shall be installed with a flange.

REAR AND SIDE UPPER ZONE WARNING LIGHTS

There shall be four (4) Whelen, Model 90**5F*R LED flashing warning lights provided with Whelen, Model 90FLANGC chrome flanges at the rear and side of the apparatus.

The side rear upper light(s) on the driver's side to be red.

The rear upper light(s) on the driver's side to be red.

The rear upper light(s) on the passenger's side to be red.

The side rear upper light(s) on the passenger's side to be red.

The color of the lenses shall be the same color as the LED's.

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

REAR LIGHT MOUNTING

The rear warning lights shall be mounted on the rear side sheet flange and rear bulkhead of the body as high as possible with all wiring totally enclosed.

TRAFFIC DIRECTING LIGHT

There shall be one (1) Whelen®, Model TAL65, 36.01" long x 2.84" high x 2.24" deep, amber LED traffic directing light installed at the rear of the apparatus.

The Whelen, Model TACTLD1, control head shall be included with this installation.

The auxiliary warning mode shall be activated with the control head only.

This traffic directing light shall be recessed with a stainless steel trim plate at the rear of the apparatus as high as practical.

The traffic directing light control head shall be located in the driver side overhead switch panel in the center panel position.

	Bidder Complies	
	Yes	No

ELECTRICAL SYSTEM GENERAL DESIGN FOR ALTERNATING CURRENT

The following guidelines shall apply to the 120/240 VAC system installation:

General

Any fixed line voltage power source producing alternating current (ac) line voltage shall produce electric power at 60 cycles plus or minus 3 cycles.

Except where superseded by the requirements of NFPA 1901, all components, equipment and installation procedures shall conform to NFPA 70, National Electrical Code (herein referred to as the NEC).

Line voltage electrical system equipment and materials included on the apparatus shall be listed and installed in accordance with the manufacturer's instructions. All products shall be used only in the manner for which they have been listed.

Grounding

Grounding shall be in accordance with Section 250-6 "Portable and Vehicle Mounted Generators" of the NEC. Ungrounded systems shall not be used. Only stranded or braided copper conductors shall be used for grounding and bonding.

An equipment grounding means shall be provided in accordance with Section 250-91 (Grounding Conductor Material) of the NEC.

The grounded current carrying conductor (neutral) shall be insulated from the equipment grounding conductors and from the equipment enclosures and other grounded parts. The neutral conductor shall be colored white or gray in accordance with Section 200-6 (Means of Identifying Grounding Conductors) of the NEC.

In addition to the bonding required for the low voltage return current, each body and driving or crew compartment enclosure shall be bonded to the vehicle frame by a copper conductor. This conductor shall have a minimum amperage rating of 115 percent of the nameplate current rating of the power source specification label as defined in Section 310-15 (amp capacities) of the NEC. A single conductor properly sized to meet the low voltage and line voltage requirements shall be permitted to be used.

All power source system mechanical and electrical components shall be sized to support the continuous duty nameplate rating of the power source.

Operation

Instructions that provide the operator with the essential power source operating instructions, including the power-up and power-down sequence, shall be permanently attached to the apparatus at any point where such operations can take place.

	Bidder Complies	
	Yes	No
Provisions shall be made for quickly and easily placing the power source into operation. The control shall be marked to indicate when it is correctly positioned for power source operation. Any control device used in the drive train shall be equipped with a means to prevent the unintentional movement of the control device from its set position. A power source specification label shall be permanently attached to the apparatus near the operator's control station. The label shall provide the operator with the information detailed in Figure 19-4.10. Direct drive (PTO) and portable generator installations shall comply with Article 445 (Generators) of the NEC. **Overcurrent protection** The conductors used in the power supply assembly between the output terminals of the power source and the main over current protection device shall not exceed 144.00" (3658 mm) in length. For fixed power supplies, all conductors in the power supply assembly shall be type THHW, THW, or use stranded conductors enclosed in nonmetallic liquid tight flexible conduit rated for a minimum of 194 degree Fahrenheit (90 degrees Celsius). For portable power supplies, conductors located between the power source and the line side of the main overcurrent protection device shall be type SO or type SEO with suffix WA flexible cord rated for 600-volts at 194 degrees Fahrenheit (90 degrees Celsius). Wiring Methods Fixed wiring systems shall be limited to the following: • Metallic or nonmetallic liquid tight flexible conduit rated at not less than 194 degrees Fahrenheit (90 degrees Celsius) • or • Type SO or Type SEO cord with a WA suffix, rated at 600 volts at not less than 194 degrees Fahrenheit (90 degrees Celsius) Electrical cord or conduit shall not be attached to chassis suspension components, water or fuel lines, air or air brake lines, fire pump piping, hydraulic lines, exhaust system components, or low voltage wiring. In addition the wiring shall be run as follows. • Separated by a minimum of 12.00" (305 mm), or properly shielded, from exhaust piping • Separated from fuel lines by a minimum of 6.00" (152 mm) distance		

	Bidder Complies	
	Yes	No
Electrical cord or conduit shall be supported within 6.00" (152 mm) of any junction box and at a minimum of every 24.00" (610 mm) of continuous run. Supports shall be made of nonmetallic materials or corrosion protected metal. All supports shall be of a design that does not cut or abrade the conduit or cable and shall be mechanically fastened to the vehicle. **Wiring Identification** All line voltage conductors located in the main panel board shall be individually and permanently identified. The identification shall reference the wiring schematic or indicate the final termination point. When prewiring for future power sources or devices, the unterminated ends shall be labeled showing function and wire size. **Wet Locations** All wet location receptacle outlets and inlet devices, including those on hardwired remote power distribution boxes, shall be of the grounding type provided with a wet location cover and installed in accordance with Section 210-7 "Receptacles and Cord Connections" of the NEC. All receptacles located in a wet location shall be not less than 24.00" (610 mm) from the ground. Receptacles on off-road vehicles shall be a minimum of 30.00" (762 mm) from the ground. The face of any wet location receptacle shall be installed in a plane from vertical to not more than 45 degrees off vertical. No receptacle shall be installed in a face up position. **Dry Locations** All receptacles located in a dry location shall be of the grounding type. Receptacles shall be not less than 30.00" (762 mm) above the interior floor height. All receptacles shall be marked with the type of line voltage (120-volts or 240-volts) and the current rating in amps. If the receptacles are direct current, or other than single phase, they shall be so marked. **Listing** All receptacles and electrical inlet devices shall be listed to UL 498, Standard for Safety Attachment Plugs and Receptacles, or other appropriate performance standards. Receptacles used for direct current voltages shall be rated for the appropriate service. **Electrical System Testing** The wiring and associated equipment shall be tested by the apparatus manufacturer or the installer of the line voltage system. The wiring and permanently connected devices and equipment shall be subjected to a dielectric voltage withstand test of 900-volts for one (1) minute. The test shall be conducted between live		

	Bidder Complies	
	Yes	No

parts and the neutral conductor, and between live parts and the vehicle frame with any switches in the circuit(s) closed. This test shall be conducted after all body work has been completed.

Electrical polarity verification shall be made of all permanently wired equipment and receptacles to determine that connections have been properly made.

Operational Test per Current NFPA 1901 Standard

The apparatus manufacturer shall perform the following operation test and ensure that the power source and any devices that are attached to the line voltage electrical system are properly connected and in working order. The test shall be witnessed and the results certified by an independent third-party certification organization.

The prime mover shall be started from a cold start condition and the line voltage electrical system loaded to 100 percent of the nameplate rating.

The power source shall be operated at 100 percent of its nameplate voltage for a minimum of two (2) hours unless the system meets category certification as defined in the current NFPA 1901 standard.

Where the line voltage power is derived from the vehicle's low voltage system, the minimum continuous electrical load as defined in the current NFPA 1901 standard shall be applied to the low voltage electrical system during the operational test.

GENERATOR

The apparatus shall be equipped with a complete electrical power system. The generator shall be a Harrison Model MCR Stealth 6.0 kW Hydraulic unit. The wiring and generator installation shall conform to the present National Electrical Codes Standards of the National Fire Protection Association. The installation shall be designed for continuous operation without overheating and undue stress on components.

Generator Performance

- Nominal Rating: 6,000 watts

- Continuous Duty Rating: 6,000 watts

- Nominal Volts: 120/240

- Amperage: 50 @ 120volts, 25 @ 240 volts

- Phase: Single

- Cycles: 60 hertz

	Bidder Complies	
	Yes	No
- Engine Speed at Engagement: Idle The generator shall be driven by a transmission power take off unit, through a hydraulic pump and motor. The generator shall include an electrical control inside the cab. The hydraulic engagement supply shall be operational at any time (no interlocks). An electric/hydraulic valve shall supply hydraulic fluid to the clutch engagement unit provided on the chassis PTO drive. The generator hydraulic circuit shall include a soft start valve to protect the generator components during PTO engagement. <u>Generator Instruments and Controls</u> To properly monitor the generator performance a digital meter panel shall be furnished and mounted next to the circuit breaker panel. The meter shall indicate the following items: - Voltage - Amperage for both lines - Frequency - Generator run hours - Over current indication - Over temperature indication - "Power On" indication - Two (2) fuse holders with two (2) amp fuses (for indicator light protection) The gauges and controls shall be installed near eye level in the compartment. Instruments shall be flush mounted in an appropriate sized weatherproof electrical enclosure. All instruments used shall be accurate within +/- two (2) percent. The load center shall have a circuit breaker to assure overload protection. The breaker furnished shall be properly sized to the generator output. <u>Generator Wiring</u> The system shall be installed by highly qualified electrical technicians to assure the required level of safety and protection to the fire apparatus operators. The wiring, electrical fixtures and components shall be to the highest industry quality standards available on the domestic market.		

	Bidder Complies	
	Yes	No
The equipment shall be the type as designed for mobile type installations subject to vibration, moisture and severe continuous usage. The following electrical components shall be the minimum acceptable quality standards for this apparatus: Wiring: All electrical wiring shall be fine stranded copper type. The wire shall be sized to the load and circuit breaker rating; ten (10) gauge on 30 amp circuits, 12 gauge on 20 amp circuits and 14 gauge on 15 amp circuits. The cable shall be run in corner areas and extruded aluminum pathways built into the body for easy access. Load Center: The main load center shall be Cutler-Hammer with circuit breakers rated to load demand. Circuit Breakers: Individual breakers shall be provided for all on-line equipment to isolate a tripped breaker from affecting any other on-line equipment. **GENERATOR LOCATION** The generator shall be mounted in the in the area over the pump on the left side. The flooring in this area shall be either reinforced or constructed in such a manner that it shall handle the additional weight of the generator. **GENERATOR START** There shall be a switch provided on the cab instrument panel to engage the generator. **GENERATOR REMOTE START** There shall be one (1) remote start switch provided on the pump panel to engage the hydraulic generator PTO and field. A light at each switch location shall be provided to indicate that the generator is running. **CIRCUIT BREAKER PANEL** The circuit breaker panel shall be located high on the forward wall of compartment D3. **DIGITAL METER PANEL INSTALLED ON WIRE COVER, CIRCUIT BRKR BOX** The generator meter panel shall be installed in D3, above breaker panel the wire cover of the circuit breaker box in place of the standard location. The digital meter panel shall be on anytime the generator is running (no green indicator light is required).		

	Bidder Complies	
	Yes	No

ELECTRIC CORD REEL

Furnished with the 120 volt AC electrical system shall be a Hannay, Series 1600, cord reel. The reel shall be provided with a 12 volt electric rewind switch that is guarded to prevent accidental operation and labeled for its intended use. The switch shall be protected with a fuse and installed at a height not to exceed 72.00" above the operators standing position.

The exterior finish of the reel(s) shall be painted #269 gray from the reel manufacturer.

A Nylatron guide is to be provided to aid in the payout and loading of the reel. A ball stop shall be provided to prevent the cord from being wound on the reel.

A label shall be provided in a readily visible location adjacent to the reel. The label shall indicate current rating, current type, phase, voltage and total cable length.

A total of one (1) cord reel shall be provided one (1) in compartment R1 high and to the left.

The cord reel should be configured with three (3) conductors.

CORD

Provided for electric distribution shall be one (1) length installed on the reel of 150 feet of yellow 10/3 electrical cord, weather resistant 105 degree Celsius to -50 degree Celsius, 600 volt jacketed SOOW cord. A Hubbell L5-20, 20 amp, 120 volt, twist lock connector body shall be installed on the end of the cord.

PORTABLE JUNCTION BOX

There shall be a total of one (1) electrical junction box(es), listed for use in wet locations and provided with light to indicate power on. Each box shall be designed to keep the exterior electrical components above 2.00" of standing water, protected from corrosion, and capable of being carried with a gloved hand.

There shall be a cable strain relief and a 1.00' pigtail with wire mesh grip, NEMA L5-20, 20 amp, 120 volt twist lock plug and boot provided for each box. Each box shall be gray powder coated.

Each Circle D, PF51G Series, box shall be provided with the following receptacles:

- Four (4) 120 vac, 20 amp single twist lock receptacles

120 VOLT RECEPTACLE

There shall be one (1), 20 amp 120 volt AC three (3) wire twist lock receptacle(s) with waterproof flip up cover(s) installed [Location, Receptacle(s)]. The NEMA configuration for the receptacles shall be L5-20R.

	Bidder Complies	
	Yes	No

The receptacle(s) shall be powered from the on board generator.

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

- Line Voltage
- Current Ratting (amps)
- Phase
- Frequency
- Power Source

120 VOLT RECEPTACLE

There shall be three (3), 20 amp 120 volt AC three (3) wire straight blade duplex receptacle(s) installed behind the driver's seat and . The NEMA configuration for the receptacles 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 Ratting (amps)
- Phase
- Frequency
- Power Source

LOOSE EQUIPMENT

The following equipment shall be furnished with the completed unit with the bid price to identify the vehicle bid price, the loose equipment bid price, and the total bid price. Loose equipment shall be listed separately with price for each item clearly identified. The City of Spartanburg reserves the right to award all, partial, or no award on the loose equipment.

- One (1) bag of chrome, stainless steel, or cadmium plated screws, nuts, bolts and washers, as used in the construction of the unit

1 HURST SP 310 E2 SPREADER #271555000

1 HURST SP 700 E2 CUTTER #272085000

1 HURST R421 E2 TELESCOPIC RAM # 274085000

1 HURST 4-BANK EDRAULIC BATTERY CHARGER # 272080910

1 HURST QUICK KIT # 247R028

		Bidder Complies	
		Yes	No
2	CTC-506 CINCH RING FROM RESCUE 42		
2	CTC 504 RATCHET STRAPS FROM RESCUE 42		
2	CTC 505 HOOK CLUSTERS FROM RESCUE 42		
1	SET OF HURST QUICK STRUTS # 362A491		
2	110 VOLT EDRAULIC ADAPTER PLUGS		
1	JUNKYARD DOG CRASH BAG COMPLETE		
1	ZIAMATIC FOAM WRENCH # 4095-005-000		
20	PAC TOOL # 1004		
2	ZICO STRAP 3099-738-000 16" TO 25"		
2	ZICO STRAP # 3099-736-000 11" TO 16"		
3	2.5" NOZZLE SCREW STYLE MOUNTS		
3	1.5" NOZZLE SCREW STYLE MOUNTS		
1	AKRON CLAMP ON FOAM TUBE FOR AKRON STYLE 4863 NOZZLE		
1	AMREX # B460 10# PURPLE K EXTINGUISHER W/HEAVY DUTY VEHICLE BRACKET		
6	X3315022000301 SCOTT AIR PAK 5.5 X3, CGA, QD, W/PAK TRACKER NFPA 2013 EDITION		
12	SCOTT HT FACEPIECES # 201215-05		
12	EPIC 3 VOICE AMPS # 200275-01		
12	SCOTT 5500 PSI 45 MINUTE CARBON CYLINDER # 200969-01		
1	SCOTT RIT 3 # 200954-05		
1	SCOTT 60 MINUTE CARBON CYLINDER # 200972-01		
1	GALLON ROUND SAFETY GAS CAN		
1	STANLEY DEAD BLOW # 57-583		
1	NUPLA 3 FT FLAT HEAD SHOVEL		

		Bidder Complies	
		Yes	No
1	SUPERVAC PPV FAN # 716G4-H-16"		
1	STILH MS 461 RESCUE SAW WITHOUT DEPTH LIMITER		
1	TURTLE PLASTICS CRIB KIT B		
2	FIRE VULCAN VEHICLE MOUNT SYSTEM FLASHLIGHTS		
5	STREAMLIGHT SURVIVOR FLASHLIGHTS W/12V CHARGER #90503		
1	FIRE HOOKS UNLIMITED R-TOOL KIT W/POUCH AND SHOVE KNIFE		
1	SURVIVOR FIVE BANK GANG CHARGER		
1	20V MAX - DCK 292L2 DEWALT COMBO KIT		
1	STERLING SEARCHLITE FDNY CONFIGURATION REFLECTIVE SEARCH LINE KIT		
2	THE "ORIGINAL" EXTINGUISHER HARNESS (FIRE HOOKS UNLIMITED)		
2	4 FT. NEW YORK ROOF HOOKS W/PRY END		
2	KOCHECK K-34 LDH SPANNER SETS		
1	5 FT. NEW YORK ROOF HOOKS W/PRY END		
1	6 FT. NEW YORK ROOF HOOKS W/PRY END IN THE LADDER COMPARTMENT		
1	8 FT. NEW YORK ROOF HOOKS W/PRY END IN THE LADDER COMPARTMENT		
3	AKRON STYLE 4863 200 GPM @ 100 PSI		
1	4.5" NST FEMALE TO 5" STORZ W/CAP AND CHAIN		
1	1" BOOSTER NOZZLE AKRON STYLE 4802 W/ZICO #NBM-1 BRACKET		
3	AKRON REVOLUTION PISTON INTAKE W/CAP AND CHAIN		
3	8# FIRE AXE 36" HANDLE (FLAT HEAD)		
1	8# FIRE AXE 36" HANDLE (PICK HEAD)		
1	APPROVED DRY CHEMICAL PORTABLE FIRE EXTINGUISHER W/A MINIMUM 80-B:C RATING WITH HEAVY DUTY TRUCK BRACKET		

		Bidder Complies	
		Yes	No
2	AAZEL 30" HALLIGAN BARS		
1	2 GAL OR LARGER WATER EXTINGUISHER WITH HEAVY DUTY TRUCK BRACKET		
1	20# CO @ EXTINGUISHER WITH HEAVY DUTY TRUCK BRACKET		
4	COMBINATION SPANNER WRENCH SETS MOUNTED IN BRACKETS FASTENED TO THE APPARATUS. AKRON STYLE 448		
3	HYDRANT WRENCHES W/SPANNERS MOUNTED IN BRACKETS FASTENED TO THE APPARATUS. AKRON STYLE 443		
1	RIGID BOLT CUTTER FASTENAL PART # 5228-98990		
1	VETTER COMPLETE 106 TON AIR BAG KIT PART # 106R148		
5	PAK TOOL #1007		
2	PAK TOOL #1002-2 FLEXMOUNT		
2	PAK TOOL #1028 GM HOOK		
1	PAK TOOL #1027		
2	ALL-PRO PORTABLE WORK LIGHTS LOWES #719784		
1	UTILITECH DROP CORD LOWES 50 FEET #67439		
1	UTILITECH DROP CORD LOWES 25' FEET #67535		
9	FIRE HOOKS UNLIMITED ALUMINUM WEDGES #WEDGE-AL		
1	BIG EASY DELUXE GLOW LOCKOUT KIT TO INCLUDE AIR BAG AND STORAGE BAG		
1	PLEASE PROVIDE A CONTINGENCY FUND of $2,000.00 FOR PLASTIX PLUS LLC		
1	RAUCKMAN M-001 METER PULLER/W METER PULLER STORAGE BAG. CAN BE FOUND ON WWW.UTILITYTOOLSUPPLY.COM		

PAINT

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

	Bidder Complies	
	Yes	No

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. A final pure water rinse shall be applied to all metal surfaces.
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 durability to the exterior surfaces. Lap style and roll-up doors shall be Clear Coated to match the body. Paint warranty for the roll-up doors shall be provided by the roll-up door manufacture.

Each batch of basecoat color shall be checked for a proper match before painting of the cab and the body. After the cab and body are painted, the color shall verified again 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

	Bidder Complies	
	Yes	No

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 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.

The cab and the body shall be painted #10 white.

PAINT - ENVIRONMENTAL IMPACT

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

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

Additionally, the finished apparatus shall not be manufactured with or contain products that have ozone depleting substances. Contractor shall, upon demand, present evidence that the manufacturing facility meets the above conditions and that it is in compliance with his State EPA rules and regulations.

	Bidder Complies	
	Yes	No

PAINT CHASSIS FRAME ASSEMBLY

The chassis frame assembly shall be painted black before the installation of the cab and body, and before installation of the engine and transmission assembly, air brake lines, electrical wire harnesses, etc.

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

- Frame rails
- Frame liners
- 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
- Fuel tank
- Castings
- Individual piece parts used in chassis and body assembly

Components treated with epoxy E-coat protection prior to paint:

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

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

PAINT, FRONT WHEELS

All wheel surfaces, inside and outside, shall be provided with powder coat paint #101 black.

PAINT, REAR WHEELS

All wheel surfaces, inside and outside, shall be provided with powder coat paint #101 black.

WHEELWELL PAINT COLOR

The cab and body wheelwell liners shall be painted flat black.

	Bidder Complies	
	Yes	No

COMPARTMENT INTERIOR PAINT

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

REFLECTIVE STRIPES

Two (2) 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 5.00" ruby red stripe at the top with a 1.00" gap, then a 3.00" ruby red stripe on the bottom.

The reflective band provided on the cab face shall be below the headlights.

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 shall be red and fluorescent yellow green diamond grade.

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.

JOG(S) IN REFLECTIVE BAND

The reflective band located on each side of the apparatus body shall contain one (1) jog(s) and shall be angled at approximately 45 degrees when installed.

TOOLBOARD DIAMOND GRADE CHEVRON STRIPING

A series of alternating red diamond grade and fluorescent yellow green diamond grade reflective stripes shall be applied to the one (1) toolboard(s) located Front, Back and sides of the swing out toolboard.

CHEVRON STRIPING ON THE FRONT BUMPER

There shall be alternating chevron striping located on the front bumper.

The colors shall be fluorescent yellow green and red diamond grade.

The size of the striping shall be 6.00".

INVERTED "V" CHEVRON STRIPING ON CAB AND CREW CAB DOORS

There shall be alternating chevron striping located on the inside of each cab and crew cab door.

The striping shall consist of the following colors:

The first color shall be fluorescent yellow green diamond grade

	Bidder Complies	
	Yes	No
The second color shall be red diamond grade The size of the striping shall be 6.00". **LETTERING** There shall be two (2) sets of one (1) to twenty (20) reflective ruby red lettering, “FIRE RESCUE” 8.00" high, with outline and shade shall be supplied and installed on each side of the hosebed above the top of compartments. **LETTERING** There shall be two (2) sets of forty-one (41) to sixty (60) reflective ruby red lettering, “CITY OF SPARTANBURG” 4.00" high, with outline and shade shall be supplied and installed on each side of the hosebed above the top of the compartments. **LETTERING, REFLECTIVE, "DIAL 911"** There shall be two (2)10.00" high ruby red reflective decal "Dial 911" installed on the rear compartment doors each side. "Dial" shall be mounted vertically and "911" shall be horizontal. **REFLECTIVE LETTERING ON ROLL-UP DOORS** There shall be one (1) set/s of reflective lettering, "KEEP BACK 500 FEET", supplied and installed on the R1 rollup door. The lettering shall be ruby red in color. **DECAL INSTALLATION** There shall be one (1) pair of decals furnished by the fire department and applied by the apparatus manufacturer. **EMBLEMS** There shall be a pair of American flag emblems, installed in the upper windows of the crew cab doors each side. The emblem shall be waving and made out of Gerber Vision material. **CAB GRILLE DESIGN** An American flag design shall be painted on the cab grille. **MANUAL, FIRE APPARATUS PARTS** Two (2) custom parts manuals for the complete fire apparatus shall be provided in hard copy with the completed unit. The manual shall contain the following: - Job number - Part numbers with full descriptions - Table of contents		

	Bidder Complies	
	Yes	No
- Parts section sorted in functional groups reflecting a major system, component, or assembly - Parts section sorted in Alphabetical order - Instructions on how to locate a part The 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 this manual is 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. **MANUALS, CHASSIS SERVICE** Two (2) chassis service manuals containing parts and service information on major components shall be provided with the completed unit. The manuals 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		

	Bidder Complies	
	Yes	No
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. **MANUALS, CHASSIS OPERATION** Two (2) chassis operation manuals shall be provided. **ONE (1) YEAR MATERIAL AND WORKMANSHIP** Each new piece of apparatus shall be provided with a minimum **one (1) year** basic apparatus material and workmanship limited warranty. The warranty shall cover such portions of the apparatus built by the manufacturer as being free from defects in material and workmanship that would arise under normal use and service. A copy of the warranty certificate shall be submitted with the bid package. **THREE (3) YEAR MATERIAL AND WORKMANSHIP** The new chassis shall be provided with a three (3) year material and workmanship limited warranty. The warranty shall cover such portions of the chassis 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. **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. **STEERING GEAR WARRANTY** A Sheppard **three (3) year** limited steering gear warranty shall be provided. A copy of the warranty certificate shall be submitted with the bid package. **FIFTY (50) YEAR STRUCTURAL INTEGRITY** The chassis frame 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. **FRONT AXLE THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY** Independent front suspension shall be provided with a **three (3) year** material and workmanship limited warranty. The manufacturer's warranty shall provide that the independent front suspension and steering gears be free from any defect related to material and workmanship on		

	Bidder Complies	
	Yes	No
the portion of the apparatus built by the manufacturer that would arise under normal use and service. A copy of the warranty certificate shall be submitted with the bid package. **REAR AXLE TWO (2) YEAR MATERIAL AND WORKMANSHIP WARRANTY** A Meritor™ Axle **two (2) 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. **TEN (10) YEAR PAINT AND CORROSION** Each new piece of apparatus shall be provided with a **ten (10) year** paint and corrosion limited warranty on the apparatus cab. The warranty shall cover painted exterior surfaces of the body to be free from blistering, peeling, corrosion, or any other adhesion defect caused by defective manufacturing methods or paint material selection that would arise under normal use and service. A copy of the warranty certificate shall be submitted with the bid package. **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. **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.		

	Bidder Complies	
	Yes	No

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.

ROLL UP DOOR MATERIAL AND WORKMANSHIP WARRANTY

The mechanical components of the roll-up door shall be warranted against defects in material and workmanship for the lifetime of the vehicle. A **six (6) year** limited warranty shall be provided on painted and satin roll up doors.

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

PUMP WARRANTY

The Waterous pump shall be provided with a **five (5) year** material and workmanship limited warranty.

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

TEN (10) YEAR PUMP PLUMBING WARRANTY

The stainless steel plumbing components and ancillary brass fittings used in the construction of the water/foam plumbing system shall be warranted for a period of **ten (10) years or 100,000 miles**. This covers structural failures caused by defective design or workmanship, or perforation caused by corrosion, provided the apparatus is used in a normal and reasonable manner. This warranty is extended only to the original purchaser for a period of ten years from the date of delivery.

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

FOAM SYSTEM WARRANTY

A **one (1) year** material and workmanship limited warranty shall be provided on the Husky 12 foam system. A **five (5) year** material and workmanship limited warranty shall be provided on the foam system control head.

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

	Bidder Complies	
	Yes	No

SIX (6) YEAR GENERATOR MATERIAL AND WORKMANSHIP WARRANTY

A Harrison Hydra-Gen generator **six (6) year** limited warranty shall be provided.

TEN (10) YEAR PAINT AND CORROSION

Each new piece of apparatus shall be provided with a **ten (10) year** paint and corrosion limited warranty on the apparatus body. The warranty shall cover painted exterior surfaces of the body to be free from blistering, peeling, corrosion, or any other adhesion defect caused by defective manufacturing methods or paint material selection that would arise under normal use and service.

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

VEHICLE STABILITY CERTIFICATION

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

ENGINE INSTALLATION CERTIFICATION

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

POWER STEERING CERTIFICATION

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

CAB INTEGRITY CERTIFICATION

The fire apparatus manufacturer shall provide a cab integrity certification with this proposal. The certification shall state that 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:

- European Occupant Protection Standard ECE Regulation No.29.

- SAE J2422 Cab Roof Strength Evaluation - Quasi-Static Loading Heavy Trucks.

- SAE J2420 COE Frontal Strength Evaluation - Dynamic Loading Heavy Trucks.

- Roof Crush

	Bidder Complies	
	Yes	No
The cab shall be subjected to a roof crush force of 22,500 lbs. This value meets the ECE 29 criteria and is equivalent to the front axle rating up to a maximum of 10 metric tons. - Side Impact The same cab shall be subjected to dynamic preload where a 13,275 lb moving barrier slams into the side of the cab at 5.5 mph at a force of 13,000 ft-lbs. This test is part of the SAE J2422 test procedure and more closely represents the forces a cab shall see in a rollover incident. - Frontal Impact The same cab shall withstand a frontal impact of 32,600 ft-lbs of force using a moving barrier in accordance with SAE J2420. Cab must meet or exceed all current industry standards applicable to fire apparatus. **WINDSHIELD WIPER DURABILITY CERTIFICATION** Visibility during inclement weather is essential to safe apparatus performance. Windshield wipers shall survive a 3 million cycle durability test in accordance with section 6.2 of SAE J198 *Windshield Wiper Systems - Trucks, Buses and Multipurpose Vehicles.* The bidder shall certify that the wiper system design has been tested and that the wiper system has met these criteria. **SEAT BELT ANCHOR STRENGTH** Seat belt attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat belt anchor design shall withstand 3000 lb of pull on both the lap and shoulder belt in accordance with FMVSS 571.210 Seat Belt Assembly Anchorages. The bidder shall certify that each anchor design was pull tested to the required force and met the appropriate criteria. **SEAT MOUNTING STRENGTH** Seat attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat mounting design shall be tested to withstand 20 G's of force in accordance with FMVSS 571.207 Seating Systems. The bidder shall certify that each seat mount and cab structure design was pull tested to the required force and met the appropriate criteria. **CAB DEFROSTER CERTIFICATION** Visibility during inclement weather is essential to safe apparatus performance. The defroster system shall clear the required windshield zones in accordance with SAE J381 Windshield Defrosting Systems Test Procedure And Performance Requirements - Trucks, Buses, And Multipurpose Vehicles.		

	Bidder Complies	
	Yes	No

CAB HEATER CERTIFICATION

Good cab heat performance and regulation provides a more effective working environment for personnel, whether in-transit, or at a scene. The cab heaters shall warm the cab 75 F from a cold-soak, within 30 minutes when tested using the coolant supply methods found in SAE J381..

CAB AIR CONDITIONING PERFORMANCE CERTIFICATION

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 67 degrees Fahrenheit in 30 minutes.

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

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