	Bidder Complies	
	Yes	No

SPECIFICATIONS FOR A TRIPLE COMBINATION PUMPER

Sealed bids will be received by Center Township of Clinton County, Indiana for the furnishing of all necessary labor, equipment and material for the Fire Apparatus and other equipment as outlined in the following specifications.

Bids will be accepted until _____, 20__ at __:_____ ___.m.

Bids will be opened on at a public meeting at the Office of Center Township of Clinton County, Indiana, 6 South Main Street, Frankfort, Indiana on _____, 20__ at __:_____ __.m.

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.

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, to ensure 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 who has had a performance bond called in the last 10 years, shall not be eligible to bid. Any bids from these manufactures shall be immediately rejected (no exception).

Each bid shall be accompanied by a set of manufacturer's set of specifications consisting of a detailed description of the apparatus, construction methods, and equipment proposed to which the apparatus furnished under contract shall conform. These specifications shall indicate size, type, model and make of all components parts and equipment, providing proof of compliance

	Bidder Complies	
	Yes	No
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 bids shall specify whether the fire department or apparatus dealership shall provide required loose equipment. In accordance with Indiana Code § 5-22-16-6, a bidder must provide and sign a Non-Collusion Affidavit. The purchaser will utilize this advertised specification to compare all submitted bids. To facilitate comparison, all bid specifications shall be submitted in the same sequence as the advertised specification. Any bidder who fails to submit a set of bid specifications, or who photo copies and submits these specifications as their own construction details will be considered nonresponsive. This shall render such bid 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 bid shall supersede the purchaser's specification will be considered a complete substitute and immediately rejected. If an offer is submitted by a trust, the trust must identify each beneficiary of the trust and each settlor empowered to revoke or modify the trust. Center Township of Clinton County, Indiana reserves the right to reject any and all bids. This contract is subject to the ability of Center Township of Clinton County, Indiana, to obtain financing to fund the purchase. 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 of the City of Frankfort, Indiana, in collaboration with Center Township of Clinton County, Indiana, 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 bid 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.

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

Bids not including all exceptions is a material breach and shall result in the bid being immediately rejected (no exception).

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 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

	Bidder Complies	
	Yes	No

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 two (2) fire departments/municipalities in the region that have bought a second time from the representing dealer. **An exception to this requirement shall not be acceptable.**

DELIVERY

Apparatus, to 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:

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.

	Bidder Complies	
	Yes	No

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

The bidder/dealership shall show that the company is 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 in conjunction with a factory authorized service center and parts repository capable of satisfying the warranty service requirements and parts requirements of the vehicle(s) being purchased.

The bidder/dealership must state the location of this authorized service center. This service center must have a staff of factory-trained mechanics, well versed in all aspects of service for all major components of the apparatus. The service center must be within twenty five (25) miles of the City of Frankfort, Indiana.

SERVICE AND WARRANTY SUPPORT (MANUFACTURER)

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

The manufacturer shall stock 1 million parts equating to $5,000,000 of inventory 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.

	Bidder Complies	
	Yes	No

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 (a minimum of 30 personnel) 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 a minimum of four 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.

INSURANCE PROVIDED BY BIDDER

COMMERCIAL GENERAL LIABILITY INSURANCE

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

Each Occurrence: $1,000,000

Products/Completed Operations Aggregate: $1,000,000

Personal and Advertising Injury: $1,000,000

General Aggregate: $2,000,000

Coverage shall be written on a Commercial General Liability form. The policy shall be written on an occurrence form and shall include Contractual Liability coverage for bodily injury and property damage subject to the terms and conditions of the policy. The policy shall include Owner as an additional insured when required by written contract.

	Bidder Complies	
	Yes	No

COMMERCIAL AUTOMOBILE LIABILITY INSURANCE

The successful bidder shall, during the performance of the contract, keep in force at least the following minimum limits of commercial automobile liability insurance and coverage shall be written on a Commercial Automobile liability form:

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

UMBRELLA/EXCESS LIABILITY INSURANCE

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

Aggregate: $3,000,000

Each Occurrence: $3,000,000

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

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

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

All policies shall provide a 30-day notice of cancellation to the named insured. The Certificate of Insurance shall provide the following cancellation clause: Should any of the above described 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 the bid. The certificate shall show the purchaser as certificate holder.

INSURANCE PROVIDED BY MANUFACTURER

PRODUCT LIABILITY INSURANCE

The manufacturer shall, during the performance of the contract and for three (3) years following acceptance of the product, keep in force at least the following minimum limits of Product Liability insurance:

Each Occurrence: $1,000,000

Products/Completed Operations Aggregate: $1,000,000

Coverage shall be written on a Commercial General Liability form. The policy shall be written on an occurrence form. The manufacturer's policy shall include the owner as

	Bidder Complies	
	Yes	No

additional insured when required by written contract between the Owner and an authorized dealer.

UMBRELLA/EXCESS LIABILITY INSURANCE

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

Each Occurrence: $25,000,000

Aggregate: $25,000,000

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

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

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

All policies shall provide a 30-day notice of cancellation to the named insured. The Certificate of Insurance shall provide the following cancellation clause: Should any of the above described polices be cancelled before the expiration date thereof, notice shall be delivered in accordance with the policy provisions.

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

SINGLE SOURCE MANUFACTURER

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

	Bidder Complies	
	Yes	No

NFPA 2016 STANDARDS

This unit shall comply with the NFPA standards effective January 1, 2016, except for fire department directed exceptions. These exceptions shall be set forth in the Statement of Exceptions.

Certification of slip resistance of all stepping, standing and walking surfaces shall be supplied with delivery of the apparatus.

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 the current edition at time of contract execution. Fire Department's specifications that differ from NFPA specifications shall be indicated in the bid as "non-NFPA."

PUMP TEST

The rated water pump shall be tested, approved, and certified by an ISO certified independent third party testing agency at the manufacturer's expense. The test results, along with 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 an ISO certified independent third party testing agency at the manufacturer's expense. The test results shall be provided to the Fire Department at the time of delivery.

	Bidder Complies	
	Yes	No

BID BOND

All bidders shall provide a bid bond as security for the bid in the form of a 10% bid bond to accompany their bid. This bid bond shall be issued by a Surety Company who is listed on the U.S. Treasury Departments list of acceptable sureties as published in Department Circular 570. The bid bond shall be issued by an authorized representative of the Surety Company and shall be accompanied by a certified power of attorney dated on or before the date of bid. The bid bond shall include language, which assures that the bidder/principal shall give a bond or bonds as may be specified in the bidding or contract documents, with good and sufficient surety for the faithful performance of the contract, including the Basic One (1) Year Limited Warranty, and for the prompt payment of labor and material furnished in the prosecution of the contract.

Bids 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.

Notwithstanding any document or assertion to the contrary, any surety bond related to the sale of a vehicle shall apply only to the Basic One (1) Year Limited Warranty for such vehicle. Any surety bond related to the sale of a vehicle shall not apply to any other warranties that are included within this bid (OEM or otherwise) or to the warranties (if any) of any third party of any part, component, attachment or accessory that is incorporated into or attached to the vehicle. In the event of any contradiction or inconsistency between this provision and any other document or assertion, this provision shall prevail.

PERFORMANCE BOND NOT REQUESTED

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

The successful bidder shall furnish a Performance and Payment bond (Bond) equal to 100 percent of the total contract amount within 30 days of the notice of award. Such Bond shall be in a form acceptable to the Owner and issued by a surety company included within the Department of Treasury's Listing of Approved Sureties (Department Circular 570) with a minimum A.M. Best Financial Strength Rating of A and Size Category of XV. In the event of a bond issued by a surety of a lesser Size Category, a minimum Financial Strength rating of A+ is required.

Bidder and Bidder's surety agree that the Bond issued hereunder, whether expressly stated or not, also includes the surety's guarantee of the vehicle manufacturer's Bumper to Bumper

	Bidder Complies	
	Yes	No

warranty period included within this bid. Owner agrees that the penal amount of this bond shall be simultaneously amended to 25 percent of the total contract amount upon satisfactory acceptance and delivery of the vehicle(s) included herein. Notwithstanding anything contained within this contract to the contrary, the surety's liability for any warranties of any type shall not exceed three (3) years from the date of such satisfactory acceptance and delivery, or the actual Bumper to Bumper warranty period, whichever is shorter.

APPROVAL DRAWING

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

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

ELECTRICAL WIRING DIAGRAMS

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

CHASSIS

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

WHEELBASE

The wheelbase of the vehicle shall be no greater than 205.00.

GVW RATING

The gross vehicle weight rating shall be a minimum of 42,000.

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 be heat-treated steel measuring 10.25" x 3.50" x .375".

Each rail shall have a section modulus of 16.00 cubic inches, yield strength of 120,000 psi, and a resisting bending moment (rbm) of 1,921,069 inch-pounds.

FRAME REINFORCEMENT

A full-length mainframe "C" liner shall be provided.

	Bidder Complies	
	Yes	No
The liner shall be an internal "C" design, heat-treated steel measuring 9.38" x 3.13" x 0.25". Each reinforcement member shall have a section modulus of 3.90 cubic inches, yield strength of 120,000 psi and resisting bending moment (rbm) of 938,762 in-lb. **FRONT AXLE** The front axle shall be a reverse "I" beam type with inclined king pins and a rated capacity of 18,000 lb. **FRONT SUSPENSION** The front springs shall be a three (3)-leaf, taper leaf design, 54.00" long x 4.00" wide, with a ground rating of 18,000 lb. The two (2) top leaves shall wrap the forward spring hanger pin. The top leaf shall also wrap the rear spring hanger pin. Both the front and rear eyes shall be Berlin style wraps that shall place the eyes in the horizontal plane within the main leaf. This shall reduce bending stress from acceleration and braking. A steel encased rubber bushing shall be used in the spring eye. The steel encased rubber bushing shall be maintenance free and require no lubrication. **SHOCK ABSORBERS** To provide a smoother ride, heavy-duty telescoping shock absorbers shall be provided on the front axle. **FRONT OIL SEALS** Oil seals with viewing window shall be provided on the front axle. **FRONT TIRES** Front tires shall be 315/80R22.50 radials, 20 ply tread, rated for 18,180 lb maximum axle load and 68 mph maximum speed. The tires shall be mounted on 22.50" x 9.00" polished aluminum disc wheels with a ten (10) stud, 11.25" bolt circle. **REAR AXLE** The rear axle shall have a capacity of 24,000 lb. **TOP SPEED OF VEHICLE** A rear axle ratio shall be furnished to allow the vehicle to reach a top speed of 68 mph. **REAR SUSPENSION** The rear suspension shall be semi-elliptical, 3.00" wide x 53.00" long, 12-leaf pack with a ground rating of 24,000 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		

	Bidder Complies	
	Yes	No

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).

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

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

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

TIRE PRESSURE MANAGEMENT
There shall be a LED tire alert pressure management system provided, that shall monitor each tire's pressure. A sensor shall be provided on the valve stem of each tire for a total of six (6) tires.

The sensor shall calibrate to the tire pressure when installed on the valve stem for pressures between 10 and 200 psi. The sensor shall activate an integral battery operated LED when the pressure of that tire drops 5 to 8 psi.

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

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

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.

	Bidder Complies	
	Yes	No

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

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

ANTI-LOCK BRAKE SYSTEM
The vehicle shall be equipped with an 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 to 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 a full air type design.

Front brakes shall be disc type with automatic pad wear adjustment and 17.00" rotors for improved stopping distance.

The rear brakes shall be 16.50" x 7.00" cam operated with automatic slack adjusters.

BRAKE SYSTEM AIR COMPRESSOR
The air compressor shall have 18.7 cubic feet per minute output.

BRAKE SYSTEM
The brake system shall include:

- Brake treadle valve
- Heated automatic moisture ejector on air dryer
- Total air system minimum capacity of 4,272 cubic inches
- Two (2) air pressure gauges with a red warning light and an audible alarm, that activates when air pressure falls below 60 psi
- Spring set parking brake system
- Parking brake operated by a push-pull style control valve
- A parking "brake on" indicator light on instrument panel
- Park brake relay/inversion and anti-compounding valve, in conjunction with a double check valve system, with an automatic spring brake application at 40 psi

	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)
- 1/4 turn drain valves on each air tank

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

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

BRAKE SYSTEM AIR DRYER

The air dryer shall be properly sized for the brake system with internal wet tank, spin-on coalescing filter cartridge and 100 watt heater.

BRAKE LINES

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

AIR INLET

One (1) air inlet with 3D series male coupling shall be provided. It shall allow station air to be supplied to the apparatus brake system through a shoreline hose. The inlet shall be located forward in the driver side lower step well of cab. A check valve shall be provided to prevent reverse flow of air. The inlet shall discharge into the "wet" tank of the brake system. A mating female fitting shall also be provided with the loose equipment.

ENGINE

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

Power:	380 hp at 2000 rpm
Torque:	1150 lb-ft at 1400 rpm
Governed Speed:	2200 rpm
Emissions Level:	EPA 2017
Fuel:	Diesel
Cylinders:	Six (6)
Displacement:	543 cubic inches (8.9L)
Starter:	Heavy duty
Fuel Filters:	Spin-on style primary filter with water separator and water-in-fuel sensor. Secondary spin-on style filter.

The engine shall include On-board diagnostics (OBD), which provides self-diagnostic and reporting. The system shall give the owner or repair technician access to state of health information for various vehicle sub systems. The system shall monitor vehicle systems, engine

	Bidder Complies	
	Yes	No
and after treatment. The system shall illuminate a malfunction indicator light on the dash console if a problem is detected. **HIGH IDLE** A high idle switch shall be provided, inside the cab, on the instrument panel, that shall automatically maintain a preset engine rpm. A switch shall be installed, at the cab instrument panel, for activation/deactivation. The high idle shall be operational only when the parking brake is on and the truck transmission is in neutral. A green indicator light shall be provided, adjacent to the switch. The light shall illuminate when the above conditions are met. The light shall be labeled "OK to Engage High Idle." **ENGINE BRAKE** An engine brake is to be installed with the controls located on the instrument panel within easy reach of the driver. The driver shall be able to turn the engine brake system on/off and have a high, medium and low setting. The engine brake shall activate when the system is on and the throttle is released. The high setting of the brake application shall activate and work simultaneously with the variable geometry turbo (VGT) provided on the engine. The engine brake shall be installed in such a manner that when the engine brake is slowing the vehicle the brake lights are activated. The ABS system shall automatically disengage the auxiliary braking device, when required. **CLUTCH FAN** A fan clutch shall be provided. The fan clutch shall be automatic when the pump transmission is in "Road" position, and constantly engaged when in "Pump" position. **ENGINE AIR INTAKE** The engine air intake shall be located above the engine cooling package. It shall draw fresh air from the front of the apparatus through the radiator grille. A stainless steel metal screen shall be installed at the inlet of the air intake system that shall meet NFPA 1901 requirements. The air cleaner and stainless steel screen shall be easily accessible by tilting the cab. **EXHAUST SYSTEM** The exhaust system shall be stainless steel from the turbo to the engine's aftertreatment device, and shall be 4.00" in diameter. The exhaust system shall include a single module		

	Bidder Complies	
	Yes	No
aftertreatment device to meet current EPA standards. An insulation wrap shall be provided on all exhaust pipes between the turbo and aftertreatment device to minimize the heat loss to the aftertreatment device. The exhaust shall terminate horizontally ahead of the right side rear wheels. A tailpipe diffuser shall be provided to reduce the temperature of the exhaust as it exits. Heat deflector shields shall be provided to isolate chassis and body components from the heat of the tailpipe diffuser. **RADIATOR** The radiator and the complete cooling system shall meet or exceed NFPA and engine manufacturer cooling system standards. For maximum corrosion resistance and cooling performance, the entire radiator core shall be constructed using long life aluminum alloy. The radiator core shall consist of aluminum fins, having a serpentine design, brazed to aluminum tubes. No solder joints or leaded material of any kind shall be acceptable in the core assembly. The radiator core shall have a minimum front area of 1060 square inches. Supply tank shall be made of heavy duty glass-reinforced nylon and the return tank shall be mode of aluminum. Both tanks shall be crimped onto the core assembly using header tabs and a compression gasket to complete the radiator core assembly. There shall be a full steel frame around the inserts to enhance cooling system durability and reliability. The radiator shall be compatible with commercial antifreeze solutions. The radiator assembly shall be isolated from the chassis frame rails with rubber isolators to prevent the development of leaks caused by twisting or straining when the apparatus operates over uneven terrain. The radiator shall include a de-aeration/expansion tank. For visual coolant level inspection, the radiator shall have a built-in sight glass. The radiator shall be equipped with a 15 psi pressure relief cap. A drain port shall be located at the lowest point of the cooling system and/or the bottom of the radiator to permit complete flushing of the coolant from the system. Shields or baffles shall be provided to prevent recirculation of hot air to the inlet side of the radiator. **COOLANT LINES** Rubber hose shall be used for all engine coolant lines to be installed by the chassis manufacturer.		

	Bidder Complies	
	Yes	No

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 aluminum with the exterior unfinished. 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 .75" drain plug shall be provided in a low point of the tank for drainage.

A fill inlet shall be located on the left hand side of the body and be covered with a hinged, spring loaded, stainless steel door that is marked "Ultra Low Sulfur - Diesel Fuel Only."

A .50" diameter vent shall be provided running from top of tank to just below fuel fill inlet.

The tank shall meet all FHWA 393.67 requirements, including a fill capacity of 95 percent of tank volume.

All fuel lines shall be provided as recommended by the engine manufacturer.

DIESEL EXHAUST FLUID TANK

A 4.5 gallon diesel exhaust fluid (DEF) tank shall be provided and mounted in the driver's side body forward of the rear axle.

A 0.50" drain plug shall be provided in a low point of the tank for drainage.

A fill inlet shall be 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.

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

TRANSMISSION

An electronic torque converting automatic transmission shall be provided.

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

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

	Bidder Complies	
	Yes	No

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.

DRIVELINE

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

The shafts shall be dynamically balanced before installation.

A splined slip joint shall be provided in each driveshaft where the driveline design requires it.

STEERING

Steering gear shall be provided with integral heavy-duty power steering. For reduced system temperatures, the power steering shall incorporate an air to oil cooler and hydraulic pump with integral pressure and flow control. All power steering lines shall have wire braded lines with crimped fittings.

A tilt and telescopic steering column shall be provided to improve fit for a broader range of driver configurations.

STEERING WHEEL

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

LOGO AND CUSTOMER DESIGNATION ON DASH

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

	Bidder Complies	
	Yes	No

The first row of text shall be: Frankfort

The second row of text shall be: Fire

The third row of text shall be: Department

BUMPER

A one (1) piece, stainless steel bumper shall be attached to the front of the frame.

A 9.00" channel shall be mounted directly behind the bumper for additional strength.

The bumper shall be extended 10.00" from front face of cab.

GRAVEL PAN

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

CENTER HOSE TRAY

A hose tray, constructed of aluminum, shall be placed in the center of the bumper extension. The tray shall be sized to not extend below the bottom of the bumper.

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 RESTRAINT

There shall be one (1) pair of hose tray restraint straps located over the center mounted tray.

The restraints shall be a pair of 2.00" wide black nylon straps with hook and loop fasteners provided. The strap(s) shall be used to secure the hose in the tray.

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.

CAB

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

The cab shall be built by the apparatus manufacturer in a facility located on the manufacturer's premises (no exception).

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

	Bidder Complies	
	Yes	No
The cab shall have 12 main vertical structural members located in the A-pillar (front cab corner posts), B-pillar (side center posts), C-pillar (rear corner posts), and rear wall areas. The A-pillar shall be constructed of solid A356-T5 aluminum castings. The B-pillar and C-pillar shall be constructed from 0.13" wall extrusions. The rear wall shall be constructed of two (2) 2.00" x 2.00" outer aluminum extrusions and two (2) 2.00" x 1.00" inner aluminum extrusions. All main vertical structural members shall run from the floor to 4.625" x 3.864" x 0.090" thick roof extrusions to provide a cage-like structure with the A-pillar and roof extrusions being welded into a 0.25" thick corner casting at each of the front corners of the roof assembly. The front of the cab shall be constructed of a 0.13" firewall plate, covered with a 0.090" front skin (for a total thickness of 0.22"), and reinforced with a full width x 0.50" thick cross-cab support located just below the windshield and fully welded to the engine tunnel. The cross-cab support shall run the full width of the cab and weld to each A-pillar, the 0.13" firewall plate, and the front skin. The cab floors shall be constructed of 0.125" thick aluminum plate and reinforced at the firewall with an additional 0.25" thick cross-floor support providing a total thickness of 0.375" of structural material at the front floor area. The front floor area shall also be supported with two (2) triangular 0.30" wall extrusions that also provides the mounting point for the cab lift. This tubing shall run from the floor wireway of the cab to the engine tunnel side plates, creating the structure to support the forces created when lifting the cab. The cab shall be 96.00" wide (outside door skin to outside door skin) to maintain maximum maneuverability (no exception). The forward cab section shall have an overall height (from the cab roof to the ground) of approximately 99.00". The crew cab section shall have a 10.00" raised roof, with an overall cab height of approximately 109.00". The overall height listed shall be calculated based on a truck configuration with the lowest suspension weight rating, the smallest diameter tires for the suspension, no water weight, no loose equipment weight, and no personnel weight. Larger tires, wheels, and suspension shall increase the overall height listed. The floor to ceiling height inside the crew cab shall be 64.50" in the center and outboard positions. The crew cab floor shall measure 36.00" from the rear wall to the front of the rear facing seat risers. The engine tunnel, at the rearward highest point (knee level), shall measure 51.50" to the rear wall. The crew cab shall be a totally enclosed design with the interior area completely open to improve visibility and verbal communication between the occupants. The cab shall be a full tilt cab style.		

	Bidder Complies	
	Yes	No

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

CAB ROOF DRIP RAIL

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

INTERIOR CAB INSULATION

The cab shall include 1.00" insulation in the ceiling, 1.50" insulation in the side walls, and 2.00" insulation in the rear wall to maximize acoustic absorption and thermal insulation.

FENDER LINERS

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

PANORAMIC WINDSHIELD

A 1-piece safety glass windshield shall be provided with over 2,775 square inches of clear viewing area. The windshield shall be full width and shall provide the occupants with a panoramic view. The windshield shall consist of three (3) layers: outer light, middle safety laminate, and inner light. The outer light layer shall provide superior chip resistance. The middle safety laminate layer shall prevent the windshield glass pieces from detaching in the event of breakage. The inner light shall provide yet another chip resistant layer. The cab windshield shall be bonded to the aluminum windshield frame using a urethane adhesive. A custom frit pattern shall be applied on the outside perimeter of the windshield for a finished automotive appearance.

WINDSHIELD WIPERS

Three (3) electric windshield wipers with washer shall be provided that meet FMVSS and SAE requirements.

The washer reservoir shall be able to be filled without raising the cab.

ENGINE TUNNEL

Engine hood side walls shall be constructed of 0.375" aluminum. The top shall be constructed of 0.125" aluminum and shall be tapered at the top to allow for more driver and passenger elbow room.

The engine hood shall be insulated for protection from heat and sound. The noise insulation keeps the dBA level within the limits stated in the current NFPA 1901 standards.

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

INTERIOR CREW CAB REAR WALL ADJUSTABLE SEATING (PATENT PENDING)

The interior rear wall of the crew cab shall have mounting holes every 2.75" to allow for adjustability of the forward facing crew cab seating along the rear wall. Seats shall be

	Bidder Complies	
	Yes	No
adjustable with use of simple hand tools allowing departments flexibility of their seating arrangement should their department needs change. **CAB REAR WALL EXTERIOR COVERING** The exterior surface of the rear wall of the cab shall be overlaid with bright aluminum treadplate except for areas that are not typically visible when the cab is lowered **CAB LIFT** A hydraulic cab lift system shall be provided consisting of an electric powered hydraulic pump, dual lift cylinders, and necessary hoses and valves. Hydraulic pump shall have a manual override for backup in the event of electrical failure. Lift controls shall be located on the right side pump panel or front area of the body in a convenient location. The cab shall be capable of tilting 43 degrees to accommodate engine maintenance and removal. The cab shall be locked down by a 2-point normally closed spring loaded hook type latch that fully engages after the cab has been lowered. The system shall be hydraulically actuated to release the normally closed locks when the cab lift control is in the raised position and cab lift system is under pressure. When the cab is completely lowered and system pressure has been relieved, the spring loaded latch mechanisms shall return to the normally closed and locked position. The hydraulic cylinders shall be equipped with a velocity fuse that protects the cab from accidentally descending when the control is located in the tilt position. For increased safety, a redundant mechanical stay arm shall be provided that must be manually put in place on the left side between the chassis and cab frame when the cab is in the raised position. This device shall be manually stowed to its original position before the cab can be lowered. **Cab Lift Interlock** The cab lift system shall be interlocked to the parking brake. The cab tilt mechanism shall be active only when the parking brake is set and the ignition switch is in the on position. If the parking brake is released, the cab tilt mechanism shall be disabled. **GRILLE** A single piece polished stainless steel grille and framework shall be provided on the front center of the cab. **DOOR JAMB SCUFFPLATES** All cab door jambs shall be furnished with a polished stainless steel scuffplate, mounted on the striker side of the jamb.		

	Bidder Complies	
	Yes	No

SIDE OF CAB MOLDING
Chrome molding shall be provided on both sides of cab.

MIRRORS
One (1) polished aluminum mirror shall be mounted on each of the side of the cab corners. The mirrors shall be 9.25" wide x 13.50" high, with a convex section. The mirror head shall have a highly polished aluminum finish.

The flat glass in each mirror shall be heated and adjustable, with remote controls that are convenient to the driver.

The convex section in each mirror shall be heated and adjustable, with remote controls that are convenient to the driver.

DOORS
To enhance entry and egress to the cab, the forward cab door openings shall be a minimum of 37.50" wide x 63.37" high. The crew cab doors shall be located on the sides of the cab and shall be constructed in the same manner as the forward cab doors. The crew cab door openings shall be a minimum of 34.30" wide x 73.25" high.

The forward cab and crew cab doors shall be constructed of extruded aluminum with a nominal material thickness of 0.093". The exterior door skins shall be constructed from 0.090" aluminum.

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 or closed. The doors shall remain locked if locks are activated when the doors are opened, then closed.

A full length, heavy duty, stainless steel, piano-type hinge with a 0.38" pin and 11 gauge leaf shall be provided on all cab doors. There shall be double automotive-type rubber seals around the perimeter of the door framing and door edges to ensure a weather-tight fit.

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

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

	Bidder Complies	
	Yes	No

The bottom cab step 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 brushed stainless steel.

MANUAL CAB DOOR WINDOWS
All cab entry doors shall contain a conventional roll down window.

ELECTRIC CAB DOOR LOCKS
The front driver and officer doors shall have a door lock master switch that shall control all front and rear crew cab door locks. Each rear crew cab door shall have its own lock control.

There shall be one (1) concealed switch located in an easily accessible chassis specific location that shall unlock all the doors.

CAB STEPS
The forward cab and crew cab access steps shall be a full size two (2) step design to provide largest possible stepping surfaces for safe ingress and egress. The bottom steps shall be designed with a grip pattern punched into bright aluminum treadplate material to provide support, slip resistance, and drainage. The bottom steps shall be a bolt-in design to minimize repair costs should they need to be replaced. The forward cab steps shall be a minimum 25.00" wide, and the crew cab steps shall be 21.65" wide with a 10.00" minimum depth. The inside cab steps shall not exceed 16.50" in height.

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

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

STEP LIGHTS
There shall be six (6) white LED step lights installed for cab and crew cab access steps.

- One (1) light for the driver's access steps.
- Two (2) lights for the driver's side crew cab access steps.
- Two (2) lights for the passenger's side crew cab access steps.
- One (1) light for the passenger's side access step.

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

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

	Bidder Complies	
	Yes	No

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

HANDRAILS BELOW CAB WINDSHIELD
A 10.00" long x 1.25" diameter handrail shall be mounted below the front cab windshield, one (1) on each side. The handrails shall be extruded aluminum with a ribbed design to provide a positive gripping surface.

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 18.70" wide x 23.75" high.

CUP HOLDER
There shall be two (2) cup holder(s) provided. Each cup holder shall have self-adjusting fingers that automatically grip beverage containers of various sizes. A recess in the cup holder shall allow it to hold beverage containers with handles.

The cup holder(s) shall be located tbd.

MOUNTING PLATE ON ENGINE TUNNEL
Equipment installation provisions shall be installed on the engine tunnel and HVAC unit.

A 0.188" smooth aluminum plate shall be bolted to the top surface of the engine tunnel, forward of the heater/air conditioning unit. The plate shall also be mounted to the top surface of the heater/air conditioning unit. The plates shall be spaced off the mounting surfaces 1.00" to allow for wire routing below the plate.

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

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

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

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

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

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

	Bidder Complies	
	Yes	No

Headliner shall be installed in both forward and rear cab sections. Headliner material shall be vinyl. A sound barrier shall be part of its composition. Material shall be installed on aluminum sheet and securely fastened to interior cab ceiling.

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

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

CAB INTERIOR UPHOLSTERY

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

CAB INTERIOR PAINT

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

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

CAB FLOOR

The cab and crew cab floor areas shall be covered with floor mat consisting of a black pyramid rubber facing and closed cell foam decoupler.

The top surface of the material has a series of raised pyramid shapes evenly spaced, which offer a superior grip surface. Additionally, the material has a 0.25" thick closed cell foam (no water absorption) which offers a sound dampening material for reducing sound levels.

CAB DEFROSTER

To provide maximum defrost and heating performance, a 43,500 BTU heater-defroster unit with 350 CFM of air flow shall be provided inside the cab. The defroster unit shall be strategically located under the center forward portion of the vacuum formed instrument panel. For easy access, a removable vacuum formed 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) 44,180 BTU auxiliary heaters with 276 CFM (each unit) of air flow shall be provided inside the crew cab, one (1) in each outboard rear facing seat riser. The heaters shall include high performance dual scroll blowers (one (1) for each unit). Outlets for the heaters shall be

	Bidder Complies	
	Yes	No

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. These heaters shall work in conjunction with the heater/air conditioner combination unit.

The heater/defroster and crew cab heaters and combination unit 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 heat controls shall control both the temperature and fan speed of the crew cab heaters and combination unit together. When the control panel is switched to the AC mode the crew cab floor heater fans shall not operate. The control panel shall include highly visible, progressive LED indicators for both fan speed and temperature.

HEATER/AIR CONDITIONING

A combination heater/air conditioning unit shall be furnished inside the cab and crew cab, mounted on the engine tunnel.

A radiator mounted condenser with a 44,000 BTU output for air conditioning and a 62,500 BTU output for heat with a 970 SCFM shall be installed. Mounting the condenser below the cab or body would reduce the performance of the system and shall not be acceptable.

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

The heater/air conditioner shall be controlled by a single electronic control panel. For ease of operation, the control panel shall include variable adjustment for temperature and fan control and be conveniently located on the dash in clear view of the driver.

SUN VISORS

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

There shall be a black plastic thumb latch provided to help secure each sun visor in the stowed position.

GRAB HANDLES

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

ENGINE COMPARTMENT LIGHTS

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

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

	Bidder Complies	
	Yes	No

ACCESS TO ENGINE DIPSTICKS

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

The engine oil dipstick shall allow for checking only. The transmission dipstick shall allow for both checking and filling.

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

CAB SAFETY SYSTEM

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

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

FRONTAL IMPACT PROTECTION

The SRS system shall provide protection during a frontal or oblique impact event. The system shall activate when the vehicle decelerates at a predetermined G force known to cause injury to the occupants. The cab and chassis shall have been subjected, via third party test facility, to a crash impact during frontal and oblique impact testing. Testing included all major chassis and cab components such as mounting straps for fuel and air tanks, suspension mounts, front suspension components, rear suspensions components, frame rail cross members, engine and

	Bidder Complies	
	Yes	No

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 four (4).

DRIVER SEAT

A seat shall be provided in the cab for the driver. The seat design shall be a cam action type, with air suspension. For increased convenience, the seat shall include a manual control to adjust the horizontal position (6.00" travel). The manual horizontal control shall be a towel-bar style located below the forward part of the seat cushion. To provide flexibility for multiple driver configurations, the seat shall have an adjustable reclining back. The seat back shall be a high back style with side bolster pads for maximum support. For optimal comfort, the seat shall be provided with 17.00" deep foam cushions designed with EVC (elastomeric vibration control).

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

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

	Bidder Complies	
	Yes	No

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

OFFICER SEAT

A seat shall be provided in the cab for the passenger. The seat shall be a fixed type, with no suspension. For optimal comfort, the seat shall be provided with 17.00" deep foam cushions designed with EVC (elastomeric vibration control).

The seat back shall be an SCBA back style with 5 degree fixed recline angle. The SCBA cavity shall be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity shall be accomplished by unbolting, relocating, and re-bolting it in the desired location.

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

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

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

RADIO COMPARTMENT

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

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

A drop-down door with 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 15.00" deep foam cushions designed with EVC (elastomeric vibration control).

The seat back shall be an SCBA back style with 5 degree fixed recline angle. The SCBA cavity shall be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity shall be accomplished by unbolting, relocating, and re-bolting it in the desired location.

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

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

	Bidder Complies	
	Yes	No

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

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

REAR FACING PASSENGER SIDE OUTBOARD SEAT

There shall be one (1) rear facing seat provided at the passenger side outboard position in the crew cab. For optimal comfort, the seat shall be provided with 15.00" deep foam cushions designed with EVC (elastomeric vibration control).

The seat back shall be an SCBA back style with 5 degree fixed recline angle. The SCBA cavity shall be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity shall be accomplished by unbolting, relocating, and re-bolting it in the desired location.

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

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

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

FORWARD FACING CENTER CABINET

A forward facing cabinet shall be provided in the crew cab at the center position.

The cabinet shall be 38.50" wide x 60.00" high x 18.00" deep. The interior door shall be web netting. The netting shall be made with 1.00" wide nylon material with 2.00" openings. The nylon webbing shall be permanently fastened at the bottom side of the cabinet and have 1.00" cam buckle fasteners on the opposite side to secure it. The clear door opening shall be 36.00" wide x 57.00" high.

The cabinet shall include two (2) infinitely adjustable shelves with a 1.25" up-turned lippainted to match the cab interior.

The cabinet shall include no louvers.

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

Cabinet Light

There shall be LED lighting installed in the cabinet. The lighting shall be controlled by a rocker switch on the front of the cabinet.

	Bidder Complies	
	Yes	No

SEAT UPHOLSTERY

All seat upholstery shall be leather grain 36 oz dark silver gray vinyl resistant to oil, grease and mildew. The cab shall have four (4) seating positions.

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 three (3) SCBA brackets.

SEAT BELTS

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

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

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

To ensure safe operation, the seats shall be equipped with seat belt sensors in the seat cushion and belt receptacle that shall activate an alarm indicating a seat is occupied but not buckled.

HELMET STORAGE PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, section 14.1.7.4.1 requires a location for helmet storage be provided.

There is no helmet storage on the apparatus as manufactured. The fire department shall provide a location for storage of helmets.

CAB DOME LIGHTS

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

The color of the LED's shall be red and white.

	Bidder Complies	
	Yes	No

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.

HAND HELD LIGHT

There shall be four (4) hand lights provided with a vehicle mount with 12VDC direct wire charging rack and quick release buckle strap mounted on the engine tunnel area.

Each light housing shall be orange in color and be provided with a LED and two (2) "ultra bright blue tail light LEDs" The tail light LEDs shall have a dual mode of blinking or steady.

CAB INSTRUMENTATION

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

GAUGES

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

- Voltmeter gauge (volts):
  - Low volts (11.8 VDC)
    - Amber telltale light on indicator light display with steady tone alarm
  - High volts (15.5 VDC)
    - Amber telltale light on indicator light display with steady tone alarm
- Engine Tachometer (RPM)
- Speedometer MPH (Major Scale), KM/H (Minor Scale)
- Fuel level gauge (Empty - Full in fractions):
  - Low fuel (1/8 full)
    - Amber indicator light in gauge dial with steady tone alarm
- Engine Oil pressure Gauge (PSI):
  - Low oil pressure to activate engine warning lights and alarms
    - Red indicator light in gauge dial with steady tone alarm
- Front Air Pressure Gauges (PSI):
  - Low air pressure to activate warning lights and alarm
    - Red indicator light in gauge dial with steady tone alarm

	Bidder Complies	
	Yes	No

- Rear Air Pressure Gauges (PSI):
  - Low air pressure to activate warning lights and alarm
    - Red indicator light in gauge dial with steady tone alarm
- Transmission Oil Temperature Gauge (Fahrenheit):
  - High transmission oil temperature activates warning lights and alarm
    - Amber indicator light in gauge dial with steady tone alarm
- Engine Coolant Temperature Gauge (Fahrenheit):
  - High engine temperature activates an engine warning light and alarms
    - Red indicator light in gauge dial with steady tone alarm
- Diesel Exhaust Fluid Level Gauge (Empty - Full in fractions):
  - Low fluid (1/8 full)
    - Amber indicator light in gauge dial

INDICATOR LAMPS

To promote safety, the following telltale indicator lamps shall be located on the instrument panel in clear view of the driver. The indicator lamps shall be "dead-front" design that is only visible when active. The colored indicator lights shall have descriptive text or symbols.

The following amber telltale lamps shall be present:

- Low coolant
- Trac cntl (traction control) (where applicable)
- Check engine
- Check trans (check transmission)
- Air rest (air restriction)
- DPF (engine diesel particulate filter regeneration)
- HET (engine high exhaust temperature) (where applicable)
- ABS (antilock brake system)
- MIL (engine emissions system malfunction indicator lamp) (where applicable)
- Regen inhibit (engine emissions regeneration inhibit) (where applicable)
- Side roll fault (where applicable)
- Front air bag fault (where applicable)
- Aux brake overheat (auxiliary brake overheat) (where applicable)
- The following red telltale lamps shall be present:
- Ladder rack down
- Parking brake
- Stop engine
- The following green telltale lamps shall be present:
- Left turn
- Right turn
- Battery on
- Ignition

	Bidder Complies	
	Yes	No

- Aux brake (auxiliary brake engaged) (where applicable)
- The following blue telltale lamps shall be present:
- High beam

ALARMS

Audible steady tone warning alarm: A steady audible tone alarm shall be provided whenever a warning condition is active.

INDICATOR LAMP AND ALARM PROVE-OUT

A system shall be provided which automatically tests telltale indicator lights and alarms located on the cab instrument panel. Telltale indicators and alarms shall perform prove-out for 3 to 5 seconds when the ignition switch is moved to the on position with the battery switch on.

CONTROL SWITCHES

For ease of use, the following controls shall be provided immediately adjacent to the cab instrument panel within easy reach of the driver. All switches shall have backlit labels for low light applications.

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

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

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

Engine start switch: A two (2)-position momentary rocker switch shall be provided. The first switch position is the default switch position. The second switch position shall activate the vehicle's engine. The switch actuator is designed to prevent accidental activation.

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

Heater and defroster controls.

	Bidder Complies	
	Yes	No

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

Windshield wiper control shall have high, low, and intermittent modes.

Parking brake control: An air actuated push/pull park brake control.

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

High idle engagement switch: A maintained rocker switch with integral indicator lamp shall be provided. The switch shall activate and deactivate the high idle function. The "OK To Engage High Idle" indicator lamp must be active for the high idle function to engage. A green indicator lamp integral to the high idle engagement switch shall indicate when the high idle function is engaged.

"OK To Engage High Idle" indicator lamp: A green indicator light shall be provided next to the high idle activation switch to indicate that the interlocks have been met to allow high idle engagement.

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

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

CUSTOM SWITCH PANELS

The design of cab instrumentation shall allow for emergency lighting and other switches to be placed within easy reach of the operator thus improving safety. There shall be positions for up to four (4) switch panels in the lower instrument console and up to six (6) switch panels in the overhead visor console. All switches have backlit labels for low light conditions.

DIAGNOSTIC PANEL

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

The diagnostic panel shall include the following:

- ENGINE/TRANSMISSION/ABS J1939 Diagnostic Port
- ABS Diagnostic Switch and Indicator - The switch and amber indicator shall allow access to diagnostic mode and display of standard ABS system fault blink codes that may be generated by the ABS system

	Bidder Complies	
	Yes	No

- DPF REGEN (Diesel Particulate Filter Regeneration Switch) (where applicable) shall be provided to request regeneration of the engine emission system. An amber indicator shall be provided on top of the switch that shall illuminate in a "CHECK ENGINE" condition
- REGEN INHIBIT (Diesel Particulate Filter Regeneration Inhibit Switch) (where applicable) shall be provided that shall request that regeneration be temporarily prevented. A green indicator shall be provided on top of the Regen Inhibit switch that shall illuminate when the Regen Inhibit feature is active. Regen Inhibit shall be disabled upon cycling of the ignition switch to the off state.

AIR RESTRICTION INDICATOR

A high air restriction warning indicator light (electronic) shall be provided.

"DO NOT MOVE APPARATUS" INDICATOR

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

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

SWITCH PANELS

The built-in switch panels shall be located in the lower console or overhead console of the cab. Switches shall be rocker type with an indicator light, of which is an integral part of the switch.

WIPER CONTROL

Wiper control shall consist of a two (2)-speed windshield wiper control with intermittent feature and windshield washer controls.

SPARE CIRCUIT

There shall be two (2) dual USB fast charge socket mounts 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 4.8 amps at 12 volts DC.
- The USB socket mount shall be officer side dash.
- Termination shall be a dual USB charger socket.
- Wires shall be sized to 125% of the protection.

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

	Bidder Complies	
	Yes	No

SPARE CIRCUIT

There shall be one (1) pair of wires, including a positive and a negative, installed on the apparatus.

The above wires shall have the following features:

- The positive wire shall be connected directly to the battery power
- The negative wire shall be connected to ground
- Wires shall be protected to 15 amps at 12 volts DC
- Power and ground shall terminate officer side dash area
- 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.

CUSTOMER SUPPLIED RADIO WIRING

There shall be one (1) 12 volt combination wiring leads of which each shall include one (1) battery switched, one (1) ignition and one (1) negative for use with radio equipment.

Each lead shall be 18.00" long and be provided tbd. The leads shall be clearly marked in a coil and terminate with butt splices.

A breaker rated for 30 amps shall be provided for circuit protection of the battery switched lead with a minimum of 10 gauge wire.

A breaker rated for 7.5 amps shall be provided for circuit protection of the ignition lead.

The wires shall be colored coded as follows:

- red for battery switched
- yellow for ignition
- black for ground

INFORMATION CENTER

There shall be a LCD display integral to the cab gauge panel provided that shall display the following information:

- Total distance
- Trip distance
- Total hours
- Trip hours
- PTO "A" hours
- PTO "B" hours

	Bidder Complies	
	Yes	No

VEHICLE DATA RECORDER

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

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

The vehicle data recorder shall be capable of recording the following data via hardwired and/or CAN inputs:

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

Seat Belt Monitoring System

A seat belt monitoring system (SBMS) shall be provided. 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.

RADIO ANTENNA MOUNT

There shall be one (1) standard 1.125", 18 thread antenna-mounting base(s) installed on the right side on the cab roof with high efficiency, low loss, coaxial cable(s) routed to the instrument panel area. A weatherproof cap shall be installed on the mount.

	Bidder Complies	
	Yes	No

ELECTRICAL POWER CONTROL SYSTEM

A compartment shall be provided in or under the cab to house the vehicle's electrical power and signal circuit protection and control components. The power and signal protection and control compartment shall contain circuit protection devices and power control devices. Power and signal protection and control components shall be protected against corrosion, excessive heat, excessive vibration, physical damage and water spray.

Serviceable components shall be readily accessible.

Circuit protection devices, which conform to SAE standard, shall be utilized to protect each circuit. All circuit protection devices shall be sized to prevent wire and component damage when subjected to extreme current overload. General protection circuit breakers shall be Type-I automatic reset (continuously resetting) and conform to SAE J553 or J258. When required, automotive type fuses conforming to SAE J554, J1284, J1888 or J2077 shall be utilized to protect electronic equipment.

Power control relays and solenoids shall have a direct current (dc) rating of 125 percent of the maximum current for which the circuit is protected.

Visual status indicators shall be supplied to identify control safety interlocks and vehicle status. In addition to visual status indicators, audible alarms designed to provide early warning of problems before they become critical shall be used.

VOLTAGE MONITOR SYSTEM

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

POWER AND GROUND STUDS

Spare circuits shall be provided in the primary distribution center for two-way radio equipment.

The spare circuits shall consist of the following:

- One (1) 12-volt DC, 30 amp battery direct spare
- One (1) 12-volt DC ground and un-fused switched battery stud located in or adjacent to the power distribution center

EMI/RFI PROTECTION

The electrical system proposed shall include means to control undesired electromagnetic and radio frequency emissions. State of the art electrical system design and components shall be used to ensure radiated and conducted EMI (electromagnetic interference) and RFI (radio frequency interference) emissions are suppressed at their source.

The apparatus proposed shall have the ability to operate in the electromagnetic environment typically found in fire ground operations. The contractor shall be able to demonstrate the EMI

	Bidder Complies	
	Yes	No

and RFI testing has been done on similar apparatus and certifies that the vehicle proposed meets SAE J551 requirements.

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

ELECTRICAL

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

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

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

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

	Bidder Complies	
	Yes	No

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

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

BATTERY SYSTEM

There shall be four (4) 12 volt batteries that include the following features shall be provided:

- 950 CCA, cold cranking amps
- 190 amp reserve capacity
- High cycle
- Group 31
- Rating of 3800 CCA at 0 degrees Fahrenheit
- 760 minutes of reserve capacity
- Threaded stainless steel studs

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

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

BATTERY SYSTEM

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

MASTER BATTERY SWITCH

There shall be a master battery switch provided within the cab within easy reach of the driver to activate the battery system.

An indicator light shall be provided on the instrument panel to notify the driver of the status of the battery system.

BATTERY COMPARTMENTS

Batteries shall be placed on non-corrosive mats and be stored in well ventilated compartments located under the cab.

Heavy-duty battery cables shall be used to provide maximum power to the electrical system. Cables shall be color coded.

Battery terminal connections shall be coated with anti-corrosion compound. Battery solenoid terminal connections shall be encapsulated with semi-permanent rubberized compound.

	Bidder Complies	
	Yes	No

JUMPER STUDS
One (1) set of battery jumper studs with plastic color-coded covers shall be included on the battery compartments.

BATTERY CHARGER
There shall be a battery charger with controller provided.

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

There shall be a remote indicator included.

The battery charger shall be located in the left body compartment mounted on the left wall as high as possible.

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

AUTO EJECT FOR SHORELINE
There shall be one (1) 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 red 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 of cab, above wheel.

ALTERNATOR
An alternator shall be provided that has a rated output current of 320 amps, as measured by SAE method J56. The alternator shall feature an integral regulator and rectifier system that has been tested and qualified to an ambient temperature of 257 degrees Fahrenheit (125 degrees Celsius). The alternator shall be connected to the power and ground distribution system with heavy-duty cables sized to carry the full rated alternator output.

	Bidder Complies	
	Yes	No

ELECTRONIC LOAD MANAGEMENT

An electronic load management (ELM) system shall be provided that monitors the vehicles 12-volt electrical system, and automatically reduces the electrical load in the event of a low voltage condition and by doing so, ensures the integrity of the electrical system.

The ELM shall monitor the vehicle's voltage while at the scene (parking brake applied). It shall sequentially shut down individual electrical loads when the system voltage drops below a preset value. Two (2) separate electrical loads shall be controlled by the load manager. The ELM shall sequentially re-energize electrical loads as the system voltage recovers.

HEADLIGHTS

There shall be four (4) 4" x 6" rectangular LED lights with heated lens mounted in the front quad style, chrome housing on each side of the cab grille:

- the outside light on each side shall contain a low beam module
- the inside light on each side shall contain a high beam module
- the headlight to include chrome bezels

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

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

DIRECTIONAL LIGHTS

There shall be two (2) 5.12" high x 7.56" wide x 1.56" deep amber LED populated arrow directional lights provided on the front of the cab, above the headlights. Each light shall be housed in the same quad common bezel as the front warning light. The lens color(s) to be clear.

INTERMEDIATE LIGHT

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

CAB CLEARANCE/MARKER/ID LIGHTS

There shall be five (5) 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.
- Two (2) amber LED clearance lights shall be installed, one (1) on each outboard side of the cab above the windshield.

FRONT CAB SIDE DIRECTIONAL/MARKER LIGHTS

There shall be two (2) amber LED lights installed front of the cab door, one (1) on each side of the cab.

	Bidder Complies	
	Yes	No

The lights shall activate as marker lights with the headlight switch and directional lights with the corresponding directional circuit.

REAR CLEARANCE/MARKER/ID LIGHTING

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

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

There shall be two (2) LED lights installed at the rear of the apparatus used as clearance lights located at the rear of the apparatus per the following:

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

There shall be two (2) LED lights installed on the side of the apparatus used as marker lights as close to the rear as practical per the following:

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

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

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

Per FMVSS 108 and CMVSS 108 requirements.

REAR FMVSS LIGHTING

The rear stop/tail and directional LED lighting shall consist of the following:

	Bidder Complies	
	Yes	No

- Two (2) red LED stop/tail lights
- Two (2) amber LED arrow turn lights

The lights shall be provided with color lenses.

The lights shall be mounted in a polished combination housing.

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

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

There shall be two (2) four (4) place chromed ABS housings provided for the rear stop/tail, directional, back up, scene lights or warning lights.

BACK-UP ALARM

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

CAB PERIMETER SCENE LIGHTS

There shall be four (4) 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.

PUMP HOUSE PERIMETER LIGHTS

There shall be four (4) white LED light strips provided.

The lights shall be mounted in the following locations:

- One (1) 12.00" LED light shall be provided under the driver's side top mount pump panel access step
- One (1) 20.00" LED light shall be provided under the driver's side pump panel running board
- One (1) 20.00" LED light shall be provided under the passenger's side pump panel running board
- One (1) 12.00" LED light shall be provided under the passenger's side top mount pump panel access step

	Bidder Complies	
	Yes	No

The light shall be activated when the battery switch is on, and controlled by the same means as the body perimeter lights.

BODY PERIMETER SCENE LIGHTS

There shall be two (2) 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.

STEP LIGHTS

Four (4) white LED step lights shall be provided. One (1) step light shall be provided on each side, on the front compartment face and two (2) step lights at the rear to illuminate the tailboard.

In order to ensure exceptional illumination, each light shall provide a minimum of 25 foot-candles (fc) covering an entire 15.00" x 15.00" square placed 10.00" below the light and a minimum of 1.5 fc covering an entire 30.00" x 30.00" square at the same 10.00" distance below the light.

These step lights shall be actuated with the pump panel light switch.

All other steps on the apparatus shall be illuminated per the current edition of NFPA 1901.

SIDE SCENE LIGHTS

There shall be four (4) LED scene light(s) with chrome flange(s) installed on the side of the apparatus, one (1) each side high and rearward of crew cab doors, one (1) high and rearward on driver's side body and one (1) high and rearward on passenger's side body.

A control for the light(s) selected above shall be 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 lights may be load managed when the parking brake is applied.

12 VOLT LIGHTING

There shall be one (1) 17,750 lumens 12 volt DC light(s) with a combination of flood and spot optics provided on the front visor, centered.

The housing(s) painted parts of this light assembly to be black.

The light(s) shall be controlled by a switch at the driver's side switch panel and by a switch at the passenger's side switch panel.

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

	Bidder Complies	
	Yes	No

DECK LIGHTS

There shall be two (2) 12 volt DC LED floodlights with swivel mount provided at the rear of the hose bed, one (1) each side.

The lights shall be activated by a control from a switch at the rear of the truck.

WALKING SURFACE LIGHT

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

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

WATER TANK

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

The tank shall be stepped in design to allow for a low hosebed.

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

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

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

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

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

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

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

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

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

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

Sump shall include a drain plug and the tank outlet.

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

	Bidder Complies	
	Yes	No
Sufficient crossmembers shall be provided to properly support bottom of tank. Crossmembers shall be constructed of steel bar channel or rectangular tubing. Tank shall "float" in cradle to avoid torsional stress caused by chassis frame flexing. Rubber cushions, .50" thick x 3.00" wide, shall be placed on all horizontal surfaces that the tank rests on. Stops or other provision shall be provided to prevent an empty tank from bouncing excessively while moving vehicle. Mounting system shall be approved by the tank manufacturer. Fill tower shall be constructed of .50" polypropylene and shall be a minimum of 8.00" wide x 14.00" long. Fill tower shall be furnished with a .25" thick polypropylene screen and a hinged cover. An overflow pipe, constructed of 4.00" schedule 40 polypropylene, shall be installed approximately halfway down the fill tower and extend through the water tank and exit to the rear of the rear axle. **SLEEVE, PLUMBING, THROUGH TANK** One (1) sleeve shall be provided in the water tank for a 3.00" pipe to the rear. **WATER TANK RESTRAINT** A heavy-duty water tank restraint shall be provided. **HOSE BED** The hose bed shall be fabricated of .125"-5052 aluminum with a nominal 38,000 psi tensile strength. The hose bed shall be as low as practical. Upper and rear edges of side panels shall have a double break for rigidity, a split tube finish shall not be acceptable. The upper inside area of the beavertails shall be covered with brushed stainless steel to prevent damage to painted surface when hose is removed. Flooring of the hose bed shall be removable aluminum grating with the top surface corrugated to aid in hose aeration. The grating slats shall be a minimum of 0.50" x 4.50" with spacing between slats for hose ventilation. A cross divider shall be provided at the front of the hose bed before the tank transitions from the lower section to the upper section. The divider shall run from the top of the side sheet down below the hose bed grating.		

	Bidder Complies	
	Yes	No

The inside of the hose bed shall be painted. The inside of the cargo area above the pump shall be painted.

Hose bed shall accommodate 700' of 5” 400’ of 3" TBD.

HOSE BED DIVIDER

Two (2) adjustable hosebed dividers shall be furnished for separating hose.

Each divider shall be constructed of a .25" brushed aluminum sheet. Flat surfaces shall be sanded for uniform appearance, or constructed of brushed aluminum.

Divider shall be fully adjustable by sliding in tracks, located at the front and rear of the hose bed.

Divider shall be held in place by tightening bolts, at each end.

Acorn nuts shall be installed on all bolts in the hose bed which have exposed threads.

HOSE BED HOSE RESTRAINT

The hose in the hose bed shall be restrained by a black nylon hook and loop strap at the top of the hose bed. At the rear of the hose bed, 2.00" black nylon webbing with a 1.50" x 4.00" box pattern shall attach at the top rear outside corners with seat belt buckle fasteners. The webbing shall have straps connected with seat belt buckle fasteners located at the rear body sheet below the hose bed.

RUNNING BOARDS

Running boards shall be fabricated of .125" bright aluminum treadplate.

Each running board shall be supported by a welded 2.00" square tubing and channel assembly, which shall be bolted to the pump compartment substructure.

Running boards shall be 12.75" deep and spaced .50" away from the pump panel.

A splash guard shall be provided above the running board treadplate.

TAILBOARD

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

The tailboard area shall be 16.00" deep.

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.

	Bidder Complies	
	Yes	No
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. **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. Side compartment flooring shall be of the sweep out design with the floor higher than the compartment door lip. The side compartment door opening shall be framed by flanging the edges in 1.75" and bending out again .75" to form an angle. Drip protection shall be provided above the doors by means of bright aluminum extrusion, formed bright aluminum treadplate or polished stainless steel. The top of the compartment shall be covered with bright aluminum treadplate rolled over the edges on the front, rear and outward side. These covers shall have the corners welded. Side compartment covers shall be separate from the compartment tops. Front facing compartment walls shall be covered with bright aluminum treadplate. All screws and bolts which protrude into a compartment shall have acorn nuts on the ends to prevent injury. **UNDERBODY SUPPORT SYSTEM** Due to the severe loading requirements of this pumper a method of body and compartment support suitable for the intended load shall be provided. The backbone of the support system shall be the chassis frame rails which is the strongest component of the chassis and is designed for sustaining maximum loads.		

	Bidder Complies	
	Yes	No

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 has been 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:

- 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.

	Bidder Complies	
	Yes	No

- Driving the vehicle at 55 mph on a smooth road.
- Accelerating the vehicle fully, until reaching the approximate speed of 45 mph on rough pavement.

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

LEFT SIDE COMPARTMENTATION

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

A full height, rollup door compartment ahead of the rear wheels shall be provided. The interior dimensions of this compartment shall be 34.50" wide x 66.63" high x 25.88" deep in the lower 25.00" of the compartment and 12.00" deep in the remaining upper portion. The clear door opening shall be a minimum of 28.75" wide x 56.88" high.

A rollup door compartment over the rear wheels shall be provided. The interior dimensions of this compartment shall be 66.50" wide x 32.88" high x 12.00" deep. The clear door opening shall be a minimum of 58.25" wide x 23.13" high.

A full height, rollup door compartment behind the rear wheels shall be provided. The interior dimensions of this compartment shall be 47.75" wide x 67.63" high x 25.88" deep in the lower 26.00" of height and 12.00" deep in the remaining upper section of the compartment. The clear door opening shall be a minimum of 44.75" wide x 57.88" high.

The interior height of the compartments shall be measured from the compartment floor to the ceiling. The spool of the rollup door at the top of the compartment takes up some usable space. The depth of the compartments shall be measured from the back wall to the inside of the door frame.

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

RIGHT SIDE COMPARTMENTATION

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

A full height, rollup door compartment ahead of the rear wheels shall be provided. The interior dimensions of this compartment shall be 34.50" wide x 66.63" high x 25.88" deep in the lower 25.00" of the compartment and 12.00" deep in the remaining upper portion. The clear door opening shall be a minimum of 28.75" wide x 56.88" high.

A rollup door compartment over the rear wheels shall be provided. The interior dimensions of this compartment shall be 66.50" wide x 32.88" high x 12.00" deep. The clear door opening shall be a minimum of 58.25" wide x 23.13" high.

A full height, rollup door compartment behind the rear wheels shall be provided. The interior dimensions of this compartment shall be 47.75" wide x 67.63" high x 25.88" deep in the lower

	Bidder Complies	
	Yes	No
26.00" of height and 12.00" deep in the remaining upper section of the compartment. The clear door opening shall be a minimum of 44.75" wide x 57.88" high. The interior height of the compartments shall be measured from the compartment floor to the ceiling. The spool of the rollup door at the top of the compartment takes up some usable space. The depth of the compartments shall be measured from the back wall to the inside of the door frame. Closing of the door shall not require releasing, unlocking, or unlatching any mechanism and shall easily be accomplished with one hand. **SIDE COMPARTMENT ROLLUP DOOR(S)** There shall be six (6) compartment doors installed on the side compartments. The doors shall be double faced aluminum construction and painted one (1) color to match the lower portion of the body. 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 180 to -40 degrees Fahrenheit. Side, top and bottom seals shall be provided to resist ingress of dirt and weather and be made of Santoprene. All hinges, barrel clips and end pieces shall be nylon 66. All nylon components shall withstand temperatures from 300 to -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. **REAR COMPARTMENTATION** A roll-up door compartment above the rear tailboard shall be provided**.**		

	Bidder Complies	
	Yes	No

The interior dimensions of this compartment shall be 40.00" wide x 33.63" high x 25.88" deep. The spool of the rollup door at the top of the compartment takes up some usable space. The depth of the compartment shall be calculated with the compartment door closed.

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

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

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

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

ROLLUP REAR COMPARTMENT DOOR

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 180 to -40 degrees Fahrenheit. Side, top and bottom seals shall be provided to resist ingress of dirt and weather and be made of Santoprene.

All hinges, barrel clips and end pieces shall be nylon 66. All nylon components shall withstand temperatures from 300 to -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 seven (7) compartment doors that shall include a guard/drip pan designed to protect the rollup door from damage when in the retracted position and contain any water spray.

	Bidder Complies	
	Yes	No

The guard shall be fabricated from stainless steel and installed left side rearward compartment, left side over the wheel compartment, left side forward compartment, right side rearward compartment, right side over the wheel compartment, right side forward compartment and rear compartment.

COMPARTMENT LIGHTING

There shall be seven (7) compartment(s) with two (2) white 12 volt DC LED compartment light strips. The dual light strips shall be centered vertically along each side of the door framing. There shall be two (2) light strips per compartment. The dual light strips shall be in all body compartment(s).

Any remaining compartments without light strips shall have a 6.00" diameter light. Each light shall have a number 1076 one filament, two wire bulb.

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

MOUNTING TRACKS

There shall be seven (7) sets of tracks for mounting shelf(s) in LS1, LS2, LS3, RS1, RS2, RS3 and B1. 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 12 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 determined at a later date.

SWING OUT TOOLBOARD

A swing out aluminum toolboard shall be provided.

It shall be a minimum of .188" thick with .203" diameter holes in a pegboard pattern with 1.00" centers between holes.

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.

	Bidder Complies	
	Yes	No

There shall be Two (2) toolboard(s) provided. The toolboard(s) shall be spatter gray painted and installed LS3 and RS3.

RUB RAIL

Bottom edge of the side and rear of the body compartments shall be trimmed with a bright aluminum extruded rub rail.

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

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

BODY FENDER CROWNS

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

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

BODY FENDER LINER

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

HARD SUCTION HOSE

Hard suction hose shall not be required.

HANDRAILS

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

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

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

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

HANDRAILS

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

	Bidder Complies	
	Yes	No

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

AIR BOTTLE STORAGE (DOUBLE)

A quantity of four (4) air bottle compartments, 15.25" wide x 7.75" tall x 26.00" deep, shall be provided on the left side forward of the rear wheels, on the left side rearward of the rear wheels, on the right side forward of the rear wheels and on the right side rearward of the rear wheels . A polished stainless steel door with a Southco raised trigger C2 chrome lever latch shall be provided to contain the air bottle. A dielectric barrier shall be provided between the door hinge, hinge fasteners and the body sheet metal.

Inside the compartment, black rubber matting shall be provided.

EXTENSION LADDER

There shall be a 24' two-section aluminum extension ladder provided.

ROOF LADDER

There shall be a 14' aluminum roof ladder provided.

LADDER STORAGE

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

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

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 folding ladder shall be installed in a U-shaped trough inside the ladder storage compartment.

PIKE POLE PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, Section 5.9.4 requires one (1) 8 ft or longer pike pole mounted in a bracket fastened to the apparatus.

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

	Bidder Complies	
	Yes	No

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

6' PIKE POLE PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, Section 5.9.4 requires one (1) 6' pike pole or plaster hook mounted in a bracket fastened to the apparatus.

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

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

PIKE POLE STORAGE

Aluminum tubing shall be used for the storage of two (2) pike poles and shall be located in ladder storage compartment. If the head of a pike pole can come in contact with a painted surface, a stainless steel scuffplate shall be provided.

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.

PUMP

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

Pump shall be the class "A" type.

Pump shall deliver the percentage of rated discharge at pressures indicated below:

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

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

-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.

	Bidder Complies	
	Yes	No

The three (3) 3.50" openings shall be located as follows: one (1) outlet to the right of the pump, one (1) outlet to the left of the pump, and one (1) outlet directly on top of the discharge manifold.

Impeller shaft shall be stainless steel, accurately ground to size. It shall be supported at each end by sealed, anti-friction ball bearings for rigid precise support. Impeller shall have flame plated hubs assuring maximum pump life and efficiency despite any presence of abrasive matter in the water supply.

Bearings shall be protected from water and sediment by suitable stuffing boxes, flinger rings, and oil seals. No special or sleeve type bearings shall be used.

PUMP PACKING

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.

PUMP TRANSMISSION

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

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

PUMPING MODE

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

AIR PUMP SHIFT

Pump shift engagement shall be made by a two (2) position sliding collar, actuated pneumatically (by air pressure), with a three (3) position air control switch located in the cab. A manual back-up shift control shall also be located on the left side pump panel.

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

	Bidder Complies	
	Yes	No

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.

INTAKE RELIEF VALVE - PUMP

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

The relief valve shall have a working range of 75 psi to 250 psi.

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

The relief valve pressure control shall be located behind the left side pump panel with a stainless steel access door.

PRESSURE CONTROLLER

A pressure governor shall be provided.

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

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

PRIMING PUMP

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

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

	Bidder Complies	
	Yes	No

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) electronic copies. 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.

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

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

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

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

FOAM SYSTEM PLUMBING

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

MAIN PUMP INLETS

A 6.00" pump manifold inlet shall be provided on each side of the vehicle. The suction inlets shall include 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 discharges shall use in-line ball valves.

	Bidder Complies	
	Yes	No

LEFT SIDE INLET
There shall be one (1) auxiliary inlet with a 2.50" valve at the left side pump panel, terminating with a 2.50" (F) National Standard hose thread adapter.

The auxiliary inlet shall be provided with a strainer, chrome swivel and plug.

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.

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 one (1) inlet.

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 stainless steel piping and a quarter turn 3.00" full flow line valve with the control remotely located at the operator's panel. Tank to pump line shall run straight (no elbows) from the pump into the front face of the water tank and angle down into the tank sump. A rubber coupling shall be included in this line to prevent damage from vibration or chassis flexing.

A check valve shall be provided in the tank to pump supply line to prevent the possibility of "back filling" the water tank.

TANK REFILL
A 1.50" combination tank refill and pump re-circulation line shall be provided, using a quarter-turn full flow ball valve controlled from the pump operator's panel.

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.

	Bidder Complies	
	Yes	No
There shall be one (1) discharge outlet with a 3.00" 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 adapter. This discharge outlet shall be actuated with a handwheel control at the pump operator's control panel. An indicator shall be provided to show when the valve is in the closed position. **FRONT DISCHARGE OUTLET** There shall be one (1) 1.50" discharge outlet piped to the front of the apparatus and located in the center bumper tray. Plumbing shall consist of 2.00" piping and flexible hose with a 2.00" 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 automatic drains provided at all low points of the piping. **REAR DISCHARGE OUTLET** There shall be one (1) discharge outlet piped to the rear of the hose bed, left side, installed so proper clearance is provided for spanner wrenches or adapters. Plumbing shall consist of 2.50" piping along with a 2.50" full flow ball valve with the control from the pump operator's panel. **DISCHARGE OUTLET (REAR)** There shall be two (2) discharge outlets piped to the rear of the hose bed. rear right side tbd Proper clearance shall be provided for spanner wrenches or adapters. Plumbing shall consist of 2.00" piping along with a 2.00" full flow ball valve with the control from the pump operator's panel. The two (2) discharge outlets shall terminate with a 1.50" male National Standard hose thread male adapter. **DISCHARGECAPS/ INLET PLUGS** Chrome plated, rocker lug, caps with chain shall be furnished for all discharge outlets 1.00" thru 3.00" in size, besides the pre-connected hose outlets. Chrome plated, rocker lug, plugs with chain shall be furnished for all auxiliary inlets 1.00" thru 3.00" in size. The caps and plugs shall incorporate a thread design to automatically relieve stored pressure in the line when disconnected (no exception).		

	Bidder Complies	
	Yes	No

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.

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).

ADDITIONAL 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).

REAR OUTLET ELBOWS

The 2.50" discharge outlets located at the rear of the apparatus shall be furnished with a 2.50" (F) National Standard hose thread x 2.50" (M) National Standard hose thread, chrome plated, 45 degree elbow.

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

	Bidder Complies	
	Yes	No

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.

SPECIAL THREAD ADAPTERS
There shall be one (1) adapter with TBD and cap. These adapters shall be installed on one of the passenger side discharges.

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.

MONITOR
A remote controlled monitor shall be properly installed on the deluge riser.

This monitor shall include a control station, mounted at the pump operator's panel.

A wireless remote control shall be furnished.

The monitor shall have manual override handwheels in the event of an electrical system malfunction.

The monitor shall be painted to match the body.

NOZZLE
A Master Stream nozzle shall be provided. The nozzle shall have a range of 250 to 1250 GPM, and electric pattern control.

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

CROSSLAY HOSE BEDS, 2.50"
Two (2) crosslays with 2.50" outlets shall be provided. Each bed to be capable of carrying 200 feet of 2.50" double jacketed hose and shall be plumbed with 2.50" i.d. pipe and gated with a 2.50" quarter turn ball valve.

Outlets to be equipped with a 2.50" National Standard hose thread 90 degree swivel located in the hose bed so that hose may be removed from either side of apparatus.

The crosslay controls shall be at the pump operator's panel.

	Bidder Complies	
	Yes	No
The center crosslay dividers shall be fabricated of .25" aluminum and shall provide adjustment from side to side. The divider shall be unpainted with a brushed finish. The remainder of the crosslay bed shall be painted job color. Stainless steel vertical scuffplates shall be provided at hose bed ends (each side of vehicle). Bottom of hose bed ends (each side) shall also be equipped with a stainless steel scuffplate. Crosslay bed flooring shall consist of removable perforated brushed aluminum. **CROSSLAY/DEADLAY HOSE RESTRAINT** A black 1.00" nylon webbing design with 2.00" box pattern shall be provided across each end of two (2) crosslay/deadlay(s) to secure the hose during travel. The webbing shall be permanently attached at the front of the crosslay/deadlay opening(s). 1.00" web straps shall loop through footman loops located at the opposite end of the permanently attached webbing. The straps shall attach with a pair of spring clip and hook fasteners. **FOAM SYSTEM** A foam eductor, with a capacity for 95 gpm, shall be installed on the discharge side of the pump. Foam eductor shall have a ball-type check valve to prevent water flow back into the foam agent line. Foam eductor shall have a quarter-turn ball valve, for alternation between the bypass and the eductor. The foam system shall be a single agent system capable of handling class A foam concentrates as well as most class B foam concentrates. The foam eductor shall be plumbed to the Crosslay #1 and crosslay #2 and 2 on rear discharge. Controls for the foam system shall be located on the pump operator's panel and labeled with red tags for easy identification. The controls for the eductor, foam supply, and the flush shall be electric over pneumatic to allow for an ergonomically designed control panel and simplified operation. Provided with the system shall be an instruction plate and plumbing schematic. All piping coming in direct contact with the foam concentrate shall be immune to the concentrate, so deterioration of the plumbing shall be avoided. This system shall have a bypass eductor type foam, with a rated capacity of 95 gpm at .25 percent .5 percent, 1 percent, 3 percent, and 6 percent. **Foam system operational considerations: 200 psi eductor inlet pressure shall be required for proper operation.** **FOAM TANK** The foam tank shall be an integral portion of the polypropylene water tank. The cell shall have a capacity of 25 gallons of foam with the intended use of Class A foam. The foam cell shall		

	Bidder Complies	
	Yes	No

reduce the capacity of the water tank. The foam cell shall have a screen in the fill dome and a breather in the lid.

FOAM TANK DRAIN

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

PUMP COMPARTMENT

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

The pump compartment substructure shall be a fabricated assembly of steel tubing, angles and channels which supports both the fire pump and the side running boards.

The pump compartment shall be mounted on the chassis frame rails with rubber biscuits in a four point pattern to allow for chassis frame twist.

Pump compartment, pump, plumbing and gauge panels shall be removable from the chassis in a single assembly.

PUMP MOUNTING

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

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.

	Bidder Complies	
	Yes	No
The gauge and valve control bezels shall be removable from the face of the pump panel for ease of maintenance. **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 six (6) white 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 painted FormCoat black 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 painted FormCoat black 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 up right position shall be quarter-turn style. Vinyl covered chains shall be used to hold the panel in the dropped position. The left and right side pump panels shall be removable and fastened with swell type fasteners. **PUMP COMPARTMENT LIGHT** There shall be one (1) 3.00" white 12 volt DC LED light(s) with flange(s) installed in the pump compartment.		

	Bidder Complies	
	Yes	No

There shall be a switch accessible through a door on the pump panel included with this installation.

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

Also provided at the pump panel shall be the following:

- Master Pump Drain Control

OK TO PUMP INDICATOR LIGHT

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

AIR HORN SWITCH

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

VACUUM AND PRESSURE GAUGES

The pump vacuum and pressure gauges shall be liquid filled.

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

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

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

Test port connections shall be provided at the pump operator's panel. One (1) shall be connected to the intake side of the pump, and the other to the discharge manifold of the pump. They shall have 0.25 in. standard pipe thread connections and non-corrosive polished stainless steel or brass plugs. They shall be marked with a label.

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

PRESSURE GAUGES

The individual "line" pressure gauges for the discharges shall be interlube filled.

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

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

	Bidder Complies	
	Yes	No

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

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

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

WATER LEVEL GAUGE

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

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

The light shall flash when the level drops below the given level indicator to provide an eighth of a tank indication. To further alert the pump operator, the lights shall flash sequentially when the water 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 water and environmental elements. An industrial pressure transducer shall be mounted to the outside of the tank. The field calibratable display measures head pressure to accurately show the tank level.

FOAM LEVEL GAUGE

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

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

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

	Bidder Complies	
	Yes	No

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 SHIELDS

Illumination shall be provided by LED strip lights at the pump control panel for controls, switches, essential instructions, gauges, and instruments necessary for the operation of the apparatus and the equipment provided on it.

Lights shall be installed under a stainless steel shield.

A light shall come on above the pump panel light switch when the parking brake is applied. This is to afford the operator some illumination when first approaching the control panel.

The remaining lights to be actuated from a switch located on the pump panel.

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 approximately 14.00" high x 9.00" wide x 5.50" deep at the top and 8.50" deep at the bottom.

AIR HORN SYSTEM

There shall be two (2) 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.

AIR HORN CONTROL

The air horns shall be actuated by a lanyard rope pull control provided within reach of the driver and a chrome push button located on the officer's side of the engine tunnel.

ELECTRONIC SIREN

An electronic siren with noise canceling microphone shall be provided.

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

The electronic siren head shall be located in switch panel # 7 area of the center dash switch panel.

	Bidder Complies	
	Yes	No

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) black nylon composite, 100-watt, speaker with through bumper mounting brackets and polished stainless steel grille provided. The speaker shall be connected to the siren amplifier.

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

AUXILIARY MECHANICAL SIREN

A mechanical siren shall be furnished. A siren brake button shall be installed on the switch panel.

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

The mechanical siren shall be recessed in the front bumper on the right side. The siren shall be supported by the bumper framework.

The mechanical siren 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 siren or the chassis horns from the horn button by means of a selector switch located on the instrument panel.

FRONT ZONE UPPER WARNING LIGHTS

There shall be one (1) 60.00" LED lightbar mounted on the cab roof.

The lightbar shall include the following:

- One (1) red flashing LED module in the driver's side rear corner position.
- Open 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.
- Open in the driver's side second front position.
- Open in the driver's side third front position.
- Open in the driver's side fourth front position.
- One (1) red flashing LED module in the driver's side fifth front position.
- One (1) red flashing LED module in the passenger's side fifth front position.
- Open in the passenger's side fourth front position.
- Open in the passenger's side third front position.
- Open 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.
- Open in the passenger's side end position.
- One (1) red flashing LED module in the passenger's side rear corner position.

	Bidder Complies	
	Yes	No

There shall be clear lenses included on the lightbar.

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

The four (4) red flashing LED modules in the front positions may be load managed when the parking brake is applied.

LIGHTS, FRONT ZONE LOWER

Two (2) LED flashing warning lights shall be installed on the cab face above the headlights, in a common bezel with the directional lights.

The driver's side front warning light to be red.

The passenger's side front warning light to be red.

Both lights shall include a clear lens.

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

HEADLIGHT FLASHER

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

There shall be a switch installed in the cab on the switch panel to control the high beam flash. This switch shall be live when the battery switch and the emergency master switches are on.

The flashing shall automatically cancel when the hi-beam headlight switch is activated or when the parking brake is set.

SIDE ZONE LOWER LIGHTING

There shall be four (4) flashing LED warning lights with chrome trim installed per the following:

- Two (2) 3.38" high x 5.50" wide lights located one (1) each side on the bumper extension. The side front lights to be red.
- Two (2) 4.31" high x 6.75" wide lights located one (1) each side above rear wheels. The side rear lights to be red.
- The lights shall include a clear lens.

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

REAR ZONE LOWER LIGHTING

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

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

Both lights shall include a lens that is clear.

	Bidder Complies	
	Yes	No

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

REAR/SIDE ZONE UPPER WARNING LIGHTS

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

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

The rear warning lights shall be mounted on top of the compartmentation with all wiring totally enclosed. The rear deck lights shall be mounted on the beavertails as high as possible.

LOOSE EQUIPMENT

Hard suction hose troughs shall be provided and shipped loose. There shall be two (2) V-shaped troughs, one (1) for each side. The hose shall be held in place by chrome plated, quarter turn, spring loaded clamps. The length of the hard suction hose that shall be carried on the troughs shall be mounted on top of each side of truck.

Troughs shall be constructed of aluminum and painted job color.

LOOSE EQUIPMENT

The following equipment shall be furnished with the completed unit:

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

WYE

one (1) Gated wye, 2-1/2" inlet to two 1-1/2" male, hard cast aluminum.

Painted red.

NFPA REQUIRED LOOSE EQUIPMENT PROVIDED BY FIRE DEPARTMENT

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

- 800 ft (60 m) of 2.50" (65 mm) or larger fire hose.
- 400 ft (120 m) of 1.50" (38 mm), 1.75" (45 mm), or 2.00" (52 mm) fire hose.
- One (1) handline nozzle, 200 gpm (750 L/min) minimum.
- Two (2) handline nozzles, 95 gpm (360 L/min) minimum.
- One (1) smoothbore of combination nozzle with 2.50" shutoff that flows a minimum of 250 gpm.
- One (1) SCBA complying with NFPA 1981 for each assigned seating position, but not fewer than four (4), mounted in brackets fastened to the apparatus or stored in containers supplied by the SCBA manufacturer.

	Bidder Complies	
	Yes	No

- One (1) spare SCBA cylinder for each SCBA carried, each mounted in a bracket fastened to the apparatus or stored in a specially designed storage space(s).
- One (1) first aid kit.
- Four (4) combination spanner wrenches.
- Two (2) hydrant wrenches.
- One (1) double female 2.50" (65 mm) adapter with National Hose threads.
- One (1) double male 2.50" (65 mm) adapter with National Hose threads.
- One (1) rubber mallet, for use on suction hose connections.
- Two (2) salvage covers each a minimum size of 12 ft x 14 ft (3.7 m x 4.3 m).
- One (1) traffic vest for each seating position, each vest to comply with ANSI/ISEA 207, *Standard for High Visibility Public Safety Vests*, and have a five-point breakaway feature that includes two (2) at the shoulders, two (2) at the sides, and one (1) at the front.
- Five (5) fluorescent orange traffic cones not less than 28.00" (711 mm) in height, each equipped with a 6.00" (152 mm) retro-reflective white band no more than 4.00" (152 mm) from the top of the cone, and an additional 4.00" (102 mm) retro-reflective white band 2.00" (51 mm) below the 6.00" (152 mm) band.
- Five (5) illuminated warning devices such as highway flares, unless the five (5) fluorescent orange traffic cones have illuminating capabilities.
- One (1) automatic external defibrillator (AED).
- Four (4) ladder belts meeting the requirements of NFPA 1983, *Standard on Fire Service Life Safety Rope and System Components* (if equipped with an aerial device).
- If the supply hose carried does not use sexless couplings, an additional double female adapter and double male adapter, sized to fit the supply hose carried, shall be carried mounted in brackets fastened to the apparatus.
- If none of the pump intakes are valved, a hose appliance that is equipped with one or more gated intakes with female swivel connection(s) compatible with the supply hose used on one side and a swivel connection with pump intake threads on the other side shall be carried. Any intake connection larger than 3.00" (75 mm) shall include a pressure relief device that meets the requirements of 16.6.6.
- If the apparatus does not have a 2.50" National Hose (NH) intake, an adapter from 2.50" NH female to a pump intake shall be carried, mounted in a bracket fastened to the apparatus if not already mounted directly to the intake.
- If the supply hose carried has other than 2.50" National Hose (NH) threads, adapters shall be carried to allow feeding the supply hose from a 2.50" NH thread male discharge and to allow the hose to connect to a 2.50" NH female intake, mounted in brackets fastened to the apparatus if not already mounted directly to the discharge or intake.

SOFT SUCTION HOSE

There shall be no soft suction hose provided.

	Bidder Complies	
	Yes	No

DRY CHEMICAL EXTINGUISHER PROVIDED BY FIRE DEPARTMENT
NFPA 1901, 2016 edition, section 5.9.4 requires one (1) approved dry chemical portable fire extinguisher with a minimum 80-B:C rating mounted in a bracket fastened to the apparatus.

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

WATER EXTINGUISHER PROVIDED BY FIRE DEPARTMENT
NFPA 1901, 2016 edition, section 5.9.4 requires one (1) 2.5 gallon or larger water extinguisher mounted in a bracket fastened to the apparatus.

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

FLATHEAD AXE PROVIDED BY FIRE DEPARTMENT
NFPA 1901, 2016 edition, Section 5.9.4 requires one (1) flathead axe mounted in a bracket fastened to the apparatus.

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

PICKHEAD AXE PROVIDED BY FIRE DEPARTMENT
NFPA 1901, 2016 edition, Section 5.9.4 requires one (1) pickhead axe mounted in a bracket fastened to the apparatus.

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

PAINT PROCESS
The exterior custom cab and/or body painting procedure shall consist of a seven (7) step finishing process. A commercial chassis paint process shall follow similar processes as determined by the chassis manufacturer. The following procedure shall be used by the apparatus manufacturer:

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

	Bidder Complies	
	Yes	No

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 base coat. A minimum thickness of 2 mils of Surfacer Primer is applied to surfaces that require a critical aesthetic finish. The surfacer primer shall be 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 base coat in all areas that have not been previously primed with the surfacer primer. The sealer primer is a two-component high solids urethane that goes on smooth and provides excellent gloss hold out when top coated.
6. Base coat Paint - Two coats of a high performance, two component high solids polyurethane base coat shall be applied. The Base coat shall be applied to a thickness that shall achieve the proper color match. The Base coat 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 base coat color. The clear coat is a two-component high solids urethane that provides superior gloss and durability to the exterior surfaces. Lap style doors shall be clear coated to match the body. Paint warranty for the roll-up doors shall be provided by the roll-up door manufacturer.

Specifications are written to define cyclic corrosion testing, physical strengths, durability and minimum appearance requirements must be met in order for an exterior paint finish to be considered acceptable as a quality finish.

Each batch of base coat 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 is 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 are used to determine the color match. A Delta E reading shall be used to determine a good color match within each family color.

All removable items such as brackets, compartment doors, door hinges, and trim shall be removed and 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.

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:

	Bidder Complies	
	Yes	No

- 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 shall be disposed of in an environmentally safe manner.
- Empty metal paint containers shall be recycled to recover the metal.
- Solvents used in clean-up operations shall be recycled on-site or sent off-site for distillation and returned for reuse.

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

PAINT

The cab shall be two-tone, with the upper section and a shield design on the cab face painted #101 black. The remaining lower section of the cab and the body shall be painted candy apple red.

PAINT CHASSIS FRAME ASSEMBLY

The chassis frame assembly shall be finished with primer and gloss black paint 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)

	Bidder Complies	
	Yes	No

- Pump house substructure
- Air tanks
- Steel 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

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

REFLECTIVE STRIPES
Three (3) 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 1.00" gold stripe at the top with a 1.00" gap then a 6.00" gold stripe with a 1.00" gap and a 1.00" gold stripe on the bottom.

CHEVRON STRIPING ON THE FRONT BUMPER
There shall be alternating chevron striping located on the front bumper.

The colors shall be red (tomato red) and lemon yellow reflective.

The size of the striping shall be 4.00".

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 two (2) jog(s) and shall be angled at approximately a 45 degrees when installed.

REAR BULKHEAD REFLECTIVE STRIPE
The reflective stripe shall continue from the sides, wrap around the rear body corners, and continue on the rear compartment bulkheads.

	Bidder Complies	
	Yes	No

CAB DOOR REFLECTIVE STRIPE
A 6.00" x 16.00" white reflective stripe shall be provided across the interior of each cab door. The stripe shall be located approximately 1.00" up from the bottom, on the door panel.

This stripe shall meet the NFPA 1901 requirement.

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

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

LETTERING
One (1) to twenty (20) genuine gold leaf lettering, 12.00" high, with outline and shade shall be provided.

MALTESE CROSS INSTALLATION
There shall be one (1) pair of maltese crosses, comprised of genuine gold leaf material, provided and installed Frankfort hotdog logo.

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

CUSTOM CHASSIS RUST PROOF / UNDERCOAT
The rust proof/undercoat option shall provide additional paint to the chassis frame rails and a protective coating that shall help fight corrosion.

Rust proof / Undercoat Process

A coating shall be applied to the custom chassis once the cab, pump and body mounting angles have been installed. The coating texture shall be waxy and pliable after drying so it shall not chip, crack, or peel off during normal vehicle operations.

The rust proofing material shall be the color black, and is a coating of a corrosion inhibitor for long-term protection against corrosion.

The material shall be applied to the following areas:

- Outside of the chassis frame rails (top & side)
- Top of the frame rails
- Top of crossmembers
- Inside of the frame rails - in and around harnesses keeping coating off harnesses as best as possible
- Between the frame and liner - coating shall be applied after frame and liner are assembled using a wand to apply material between as best as possible
- Top of the body mounting angles (including rear platform)

	Bidder Complies	
	Yes	No

- Top of air tanks
- Top of fuel tank

FIRE APPARATUS PARTS MANUAL

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

SERVICE PARTS INTERNET SITE

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

CHASSIS SERVICE MANUALS

There shall be one (1) chassis service manuals on USB flash drives containing parts and service information on major components provided with the completed unit.

The manual shall contain the following sections:

- Job number
- Table of contents
- Troubleshooting
- Front Axle/Suspension
- Brakes
- EngineTires
- Wheels
- Cab
- Electrical, DC
- Air Systems
- Plumbing
- Appendix

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

CHASSIS OPERATION MANUAL

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

ONE (1) YEAR MATERIAL AND WORKMANSHIP

Each new piece of apparatus shall be provided with a minimum **one (1) year** basic apparatus material and workmanship limited warranty. The warranty shall cover such portions of the apparatus built by the manufacturer as being free from defects in material and workmanship that would arise under normal use and service.

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

	Bidder Complies	
	Yes	No

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

STEERING GEAR WARRANTY
A **one (1) year** limited steering gear warranty shall be provided. A copy of the warranty certificate shall be submitted with the bid package.

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

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

FRONT AXLE WARRANTY
A **five (5)-year/100,000 mile** parts and labor warranty shall be provided.

REAR AXLE WARRANTY
A **five (5)-year/100,000 mile** parts and labor warranty shall be provided.

BRAKE SYSTEM THREE (3) YEAR MATERIAL AND WORKMANSHIP WARRANTY
A **three (3) year** brake system limited warranty shall be provided.

TEN (10) YEAR STRUCTURAL INTEGRITY
The new cab shall be provided with a **ten (10) year** material and workmanship limited warranty. The warranty shall cover such portions of the cab built by the manufacturer as being free from structural failures caused by defects in material and workmanship that would arise under normal use and service.

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

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

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

COMPARTMENT LIGHT WARRANTY
A ten (10) year material and workmanship limited warranty shall be provided for the 12 volt DC LED strip lights**.** The warranty shall cover the LED strip lights to be free from defects in material and workmanship that would arise under normal use.

	Bidder Complies	
	Yes	No
A copy of the warranty certificate shall be submitted with the bid package (no exception). **TRANSMISSION WARRANTY** The transmission shall have a **five (5) year/unlimited mileage** warranty covering 100 percent parts and labor. The warranty is to be provided by transmission supplier and not the apparatus builder. **TRANSMISSION COOLER WARRANTY** The transmission cooler shall carry a five (5) year parts and labor warranty (exclusive to the transmission cooler). In addition, a collateral damage warranty shall also be in effect for the first three (3) years of the warranty coverage and shall not exceed $10,000 per occurrence. A copy of the warranty certificate shall be submitted with the bid package. **WATER TANK WARRANTY** The poly water tank shall be provided with a lifetime material and workmanship limited warranty. A copy of the warranty certificate shall be submitted with the bid package (no exception). **TEN (10) YEAR STRUCTURAL INTEGRITY** Each new piece of apparatus shall be provided with a **ten (10) year** material and workmanship limited warranty on the apparatus body. The warranty shall cover such portions of the apparatus built by the manufacturer as being free from defects in material and workmanship that would arise under normal use and service. A copy of the warranty certificate shall be submitted with the bid package (no exception). **ROLL UP DOOR MATERIAL AND WORKMANSHIP WARRANTY** A roll-up door limited warranty shall be provided. 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 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.		

	Bidder Complies	
	Yes	No

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

TEN (10) YEAR PRO-RATED PAINT AND CORROSION

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

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

THREE (3) YEAR MATERIAL AND WORKMANSHIP

The gold leaf lamination shall be provided with a **three (3) year** material and workmanship limited warranty. The warranty shall cover the gold leaf lamination as being free from defects in material and workmanship that would arise under normal use and service.

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

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 crash test certification with this bid. 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.

	Bidder Complies	
	Yes	No

There shall be no exception to any portion of the cab integrity certification. Nonconformance shall lead to immediate rejection of bid.

CAB DOOR DURABILITY CERTIFICATION

Robust cab doors help protect occupants. Cab doors shall survive a 200,000 cycle door slam test where the slamming force exceeds 20 G's of deceleration. The bidder shall certify that the sample doors similar to those provided on the apparatus have been tested and have met these criteria without structural damage, latch malfunction, or significant component wear.

WINDSHIELD WIPER DURABILITY CERTIFICATION

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

SEAT BELT ANCHOR STRENGTH

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

SEAT MOUNTING STRENGTH

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

CAB DEFROSTER CERTIFICATION

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

AMP DRAW REPORT

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

The manufacturer of the apparatus shall provide the following:

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

	Bidder Complies	
	Yes	No
○ 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).		