Bidder Complies	
Yes	No

SPECIFICATIONS FOR A TRACTOR-DRAWN AERIAL

SPECIFICATIONS FOR A TRACTOR-DRAWN AERIAL

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

INTENT OF SPECIFICATIONS

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

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 shall not be acceptable.

The apparatus shall be designed with due consideration to distribution of load between the front and rear axles. Weight balance and distribution shall be in accordance with the recommendations of the National Fire Protection Association.

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

QUALITY AND WORKMANSHIP

All steel welding shall follow American welding Society D1.1-2004 recommendations for structural steel welding. All aluminum welding shall follow American welding Society and ANSI D1.2-2003 requirements for structural welding of aluminum. All sheet metal welding shall follow American Welding Society B2.1-2000 requirements for structural welding of sheet metal. Flux core arc welding to use alloy rods, type 7000, American welding Society standards A5.20-E70T1. Employees classified as welders are tested and certified to meet the American Welding Society codes upon hire and every three (3) years thereafter. The manufacturer shall be

	Bidder Complies	
	Yes	No

required to have an American welding Society certified welding inspector in plant during working hours to monitor weld quality.

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

To demonstrate the quality of the product and service, each bidder shall provide a list of at least ten (10) fire departments/municipalities in the region that have bought a second time from the representing dealer. **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 completed apparatus as delivered. A permanent plate shall be mounted in the driver's compartment which specifies the quantity and type of fluids required including engine oil, engine coolant, transmission, pump transmission lubrication, pump primer and drive axle.

SAFETY VIDEO

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

PERFORMANCE TESTS AND REQUIREMENTS

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

	Bidder Complies	
	Yes	No

A) The apparatus, when fully equipped and loaded, shall have not less than 25 percent nor more than 50 percent of the weight on the front axle, and not less than 50 percent nor more than 75 percent on the rear axle.

B) The apparatus shall be capable of accelerating to 35 mph from a standing start within 25 seconds on a level concrete highway without exceeding the maximum governed rpm of the engine.

C) The service brakes shall be capable of stopping a fully loaded vehicle in 35 feet at 20 mph on a level concrete highway. The air brake system shall conform to Federal Motor Vehicle Safety Standards (FMVSS) 121.

D) The apparatus, fully loaded, shall be capable of obtaining a speed of 60 mph on a level concrete highway with the engine not exceeding its governed rpm (full load).

FAILURE TO MEET TEST

In the event the apparatus fails to meet the test requirements of these specifications on the first trials, second trials may be made at the option of the bidder within 30 days of the date of the first trials. 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.

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

INSURANCE PROVIDED BY MANUFACTURER

PRODUCT LIABILITY INSURANCE

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

Each Occurrence$1,000,000

Products/Completed Operations Aggregate$1,000,000

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

	Bidder Complies	
	Yes	No
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, pump house (including the sheet metal enclosure, valve controls, piping and operators' panel) body and aerial device being designed, fabricated and assembled on the bidder's premises. The electrical system (hardwire or multiplex) shall be both designed and integrated by the same apparatus manufacturer. The warranties relative to these major components (excluding component warranties such as engine, transmission, axles, pump, etc.) must be from a single source manufacturer and not split between manufacturers (i.e. body, pump house, cab weldment, chassis and aerial). The bidder shall provide evidence that they comply with this requirement. The bidder shall state the location of the factory where the apparatus is to be built.		
NFPA 2016 STANDARDS This unit shall comply with the NFPA standards effective January 1, 2016, except for fire department 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.		

EXHIBIT B (Tractor Drawn Aerial)

Bidder Complies	
Yes	No

NFPA COMPLIANCY

Apparatus proposed by the bidder shall meet the applicable requirements of the National Fire Protection Association (NFPA) as stated in current edition at time of contract execution. Fire department's specifications that differ from NFPA specifications shall be indicated in the proposal as "non-NFPA".

VEHICLE INSPECTION PROGRAM CERTIFICATION

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

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

INSPECTION CERTIFICATE

A third-party inspection certificate for the aerial device shall be furnished upon delivery of the aerial device. The certificate shall indicate that the aerial device has been inspected on the production line and after final assembly.

Visual structural inspections shall be performed on all welds on both aluminum and steel ladders.

On critical weld areas, or on any suspected defective area, the following tests shall be conducted:

- Magnetic particle inspection shall be conducted on steel aerials to assure the integrity of the weldments and to detect any flaws or weaknesses. Magnets shall be placed on each side of the weld while iron powder is placed on the weld itself. The powder shall detect any crack that may exist. This test shall conform to ASTM E709 and be performed prior to assembly of the aerial device.

- A liquid penetrant test shall be conducted on aluminum aerials to assure the integrity of the weldments and to detect any flaws or weaknesses. This test shall conform to ASTM E165 and be performed prior to assembly of the aerial device.

- Ultrasonic inspection shall conducted on all aerials to detect any flaws in pins, bolts and other critical mounting components.

In addition to the tests above, functional tests, load tests, and stability tests shall be performed on all aerials. These tests shall determine any unusual deflection, noise, vibration, or instability characteristics of the unit.

	Bidder Complies	
	Yes	No

PUMP TEST

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

GENERATOR TEST

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

BREATHING AIR TEST

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

REQUIREMENTS OF THE APPARATUS MANUFACTURER

The manufacturer of the apparatus must be fully owned and managed by a Parent Company,

Corporation, Partnership, or that is a company 100 percent held in the United States of America.

Proposals from any manufacturer that is fully or partially owned and/or operated by a Foreign Company, Corporation, Partnership, or that is a company under any type of ownership, partnership, or any similar type of agreement shall be rejected immediately and their bid disqualified (no exception).

INSPECTION TRIP(S)

The bidder shall provide three (3) factory inspection trip(s) for Five (5) customer representative(s) for the tractor-drawn aerial. The inspection trip(s) shall be scheduled at times mutually agreed upon between the manufacturer's representative and the customer. All costs such as travel, lodging and meals shall be the responsibility of the bidder.

EXHIBIT B (Tractor Drawn Aerial)

	Bidder Complies	
	Yes	No

AFTERMARKET SUPPORT WEBSITE

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

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

The website shall provide the following to the designated individuals:

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

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

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

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

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

- Authorized dealer only - access to manufacturer Service Bulletins and Work

Instructions containing information on current service topics and recommendations provided.

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

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

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

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Bidder Complies	
Yes	No

TABLE OF CONTENTS

A table of contents shall be provided with all proposals, for ease in locating items which shall be provided by the bidder

BID BOND

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

Proposals received from bidders who do not manufacture the chassis shall provide a warranty that shall be issued jointly and severally by, and signed by, both the bidder and the chassis manufacturer.

If the successful bidder does not manufacture the chassis, the bidder shall supply a warranty bond, in addition to their performance bond, along with their signed contract. This warranty bond shall guarantee all terms and conditions of the Basic One (1) Year Limited Warranty and names both the bidder and chassis manufacturer as co-principals. This warranty bond shall be 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, 1 YEAR

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 Complies	
	Yes	No

Bidder and Bidder's surety agree that the Bond issued hereunder, whether expressly stated or not, also includes the surety's guarantee of the vehicle manufacturer's Basic One (1) Year Limited Warranty period included within this proposal. Owner agrees that the penal amount of this bond shall be simultaneously amended to 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 one (1) year from the date of such satisfactory acceptance and delivery, or the actual Basic One (1) Year Limited Warranty period, whichever is shorter.

APPROVAL DRAWING

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

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

DRAWING, COMPARTMENT LAYOUT

A basic drawing shall be provided for the interior body compartments. This drawing shall be provided for graphic representation only and shall include such things as shelves, trays, reels, dividers, air control panels, air bottle storage bins, poly boxes, etc.

DRAWING, CAB TOP VIEW

On the sales drawing a top view of the cab seating and EMS cabinets shall be provided. The top view shall be a reference only of the seating and EMS cabinets in the order.

ELECTRICAL WIRING DIAGRAMS

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

DIAGRAM, AS BUILT AIR BRAKE SCHEMATIC

There shall be a detailed diagram of the air brake system provided upon delivery. The diagram shall include air lines and parts that shall be located within the system.

DRAWING, RIGHT PUMP PANEL

A detailed drawing to scale of the right pump panel shall be provided for approval prior to construction. This drawing shall include all the items located on the left pump panel.

EXHIBIT B (Tractor Drawn Aerial)

	Bidder Complies	
	Yes	No

FINAL DRAWING

There shall be a revised drawing of the truck with all the changes made during production provided at pickup.

DRAWING, PUMP OPERATOR'S PANEL

A detailed drawing to scale of the pump operator's panel shall be provided for approval prior to construction. This drawing shall include all the gauges and controls located on the pump operator's panel.

TRACTOR CHASSIS

The tractor 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 tractor chassis shall be designed and manufactured for heavy-duty service, with adequate strength and capacity for the intended load to be sustained and the type of service required.

MAXIMUM OVERALL HEIGHT

The maximum overall height of the apparatus shall be 11' 10".

MAXIMUM OVERALL LENGTH

The maximum overall length of the apparatus, including bumpers, lights, etc. shall be 64’

WHEELBASE

The wheelbase of the tractor vehicle shall be no greater than 212” from center of front axle to center between the set of tandem rear axles

ANGLE OF DEPARTURE

The angle of departure shall be 14 degrees. This shall be effective with the truck in a loaded state.

ANGLE OF APPROACH

The angle of approach shall be 15 degrees. This shall be effective with the truck in a loaded state.

GVW RATING

The gross vehicle weight rating shall be a minimum of 49,800.

	Bidder Complies	
	Yes	No

FRAME

The chassis frame shall be built with two (2) steel channels bolted to five (5) cross members or more, depending on other options of the apparatus.

The side rails shall have a 13.38" tall web over the front and mid sections of the chassis, with a continuous smooth taper to 10.75" over the rear axle.

Each rail shall have a section modulus of 25.992 cubic inches and a resisting bending moment (rbm) of 3,119,040 in-lb. over the critical regions of the frame assembly, with a section modulus of 18.96 cubic inches with a rbm of 2,275,200 in-lb. over the rear axle.

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

FRAME REINFORCEMENT

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

The frame liner shall be mounted inside of the chassis frame rail, beginning at the front edge of the mainframe rail and extending to the rear cab cross member.

FRONT NON-DRIVE AXLE

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

The turning angle shall be 45 degrees.

FRONT SUSPENSION

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

FRONT SHOCK ABSORBERS

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

FRONT OIL SEALS

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

EXHIBIT B (Tractor Drawn Aerial)

Bidder Complies	
Yes	No

FRONT TIRES

Front tires shall be 425/65R22.50 radials, 20 ply highway tread, rated for 22,800 lb. maximum

axle load and 68 mph maximum speed.

The tires shall be mounted on Alcoa 22.50" x 12.25" black powder-coated steel disc type wheels with a ten (10) stud, 11.25" bolt circle.

REAR AXLE

Tandem axle on tractor

REAR AXLE

The rear axle shall be a tandem axle assembly with a capacity of 40,000 lb.

An inter-axle differential lock, which divides torque evenly between axles, shall be provided with an indicator light mounted on the cab instrument panel.

TOP SPEED OF VEHICLE

A rear axle ratio shall be furnished to allow the vehicle to reach a top speed of 65 MPH

REAR SUSPENSION

Rear suspension shall be an air ride with a ground rating of 46,000 lb. The suspension shall have the following features:

- Heavy-duty shock absorbers to protect air springs from overextension

- Heavy-duty torque rods and bushings

- Premium, heavy-duty rubber bushings require no lubrication

- Integrated stabilizer design results in greater stability

- Low spring rate air springs for excellent ride quality

- Dual height control valves to maintain level vehicle from side to side

REAR OIL SEALS

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

Bidder Complies	
Yes	No

DRIVER CONTROL DIFFERENTIAL LOCK (DCDL)

The rear axle of the rear tandem axles shall be equipped with a driver controlled differential lock (DCDL). The control shall be located within easy reach of the driver.

DRIVER CONTROL DIFFERENTIAL LOCK (DCDL)

A rear tandem axle shall be equipped with a driver controlled differential lock (DCDL). The control shall be located within easy reach of the driver.

This shall be set up with the interaxle lock. The differential lock shall only engage after the interaxle lock is applied.

REAR TIRES

Rear tires shall be four (8) 12R22.50 radials, 16 ply all season, rated for 54,240 lb. maximum

axle load and 75 mph maximum speed.

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

TIRE BALANCE

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

TIRE PRESSURE MANAGEMENT

There shall be a 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 (12 tires. 10 for tractor and 2 for trailer.

EXTENDER, VALVE STEM FOR REAR DUALS

A pair of 180-degree valve stem extenders shall be installed on the valve stems of the rear outside tires. The extender shall allow the tire pressure monitor cap to face the outside.

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.

CHROME LUG NUT COVERS

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

Bidder Complies	
Yes	No

MUD FLAPS

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

WHEEL CHOCKS

There shall be one (2) pair of folding aluminum alloy wheel blocks, with easy-grip handle provided on both sides of the apparatus.

WHEEL CHOCK BRACKETS

There shall be one (2 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. One (1) pair brackets shall be mounted forward of the left side rear tractor tire, the other brackets to be mounted forward of the right-side rear tractor tire

ANTI-LOCK BRAKE SYSTEM

The vehicle shall be equipped with an anti-lock braking system. The ABS shall provide a four (4) channel anti-lock braking control on both the front, rear tractor axle, and a two (2) channel system on the tiller axle. It shall be a digitally controlled system that utilizes microprocessor technology to 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 then shall 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.

AUTOMATIC TRACTION CONTROL

An anti-slip feature shall be included with the ABS. The Automatic Traction Control shall be used for traction in poor road and weather conditions. The Automatic Traction Control shall act as an electronic differential lock which shall not allow a driving wheel to spin, thereby supplying traction at all times. The ABS electronic control unit (ECU) shall work with the engine ECU, sharing information concerning wheel slip. Engine ECU shall use information to control engine speed, allowing only as much throttle application as required for the available traction, regardless of how much the driver is asking for. A "mud/snow" switch shall be provided on the instrument panel. Activation of the switch shall allow additional tire slip to let the truck climb out and get on top of deep snow or mud.

BRAKES

The service brake system shall be full air type.

The front brakes shall be air disc type. The brake rotors shall be 17.00" ventilated.

The rear brakes shall be disc operated with automatic slack adjusters and a 17.00" ventilated rotor for improved stopping distance.

Bidder Complies	
Yes	No

BRAKE SYSTEM AIR COMPRESSOR

The air compressor shall have 18.7 cubic feet per minute output.

BRAKE SYSTEM

The brake system shall include:

- Dual brake treadle valve
- Heated automatic moisture ejector on air dryer
- Total air system capacity of 4,362 cubic inches
- Two (2) air pressure gauges with a red warning light and an audible alarm, that activates when air pressure falls below 60 psi
- Spring set parking brake system
- Parking brake operated by a push-pull style control valve
- A parking "brake on" indicator light on instrument panel
- Park brake relay/inversion and anti-compounding valve, in conjunction with a double check valve system, with an automatic spring brake application at 40 psi
- 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 valve 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 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.

	Bidder Complies	
	Yes	No

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.

ALL WHEEL LOCK-UP

An additional all wheel lock-up system shall be installed which applies air to the front brakes only. The standard spring brake control valve system shall be used for the rear.

ADDITIONAL AIR TANK

An additional air tank with 1,454 cubic inch displacement shall be provided to increase the capacity of the air system. This tank shall be dedicated for air horn use.

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).

The output flow of the engine air compressor varies with engine rpm. Full compressor output is only achieved at governed engine speed. Engine speed may be limited by generators, pumps and other PTO driven options.

AIR TANK, ADDITIONAL

An additional air tank with 1454 cubic inch displacement shall be provided to increase the capacity of the main air brake system. This tank shall be plumbed into the rear half of the brake system.

The air tank shall be primed and painted to meet a minimum 750-hour spray test. To reduce the effects of corrosion, the air tank shall be mounted with stainless steel brackets. (no exception)

The output flow of the engine air compressor shall vary with engine rpm. Full compressor output shall only be achieved at governed engine speed. Engine speed shall be limited by generators, pumps and other PTO driven options.

AIR TANK CLAMPS

All clamps supporting the chassis air tanks shall be a heavy-duty stainless-steel style clamp.

GUARD, FRONT WHEEL LOCK

A U-bolt type protective guard shall be installed over the "Front Wheel Lock" knob to prevent accidental activation of the brake.

Bidder Complies	
Yes	No

U-BOLT GUARD OVER PARKING BRAKE KNOB

There shall be one (1) U-bolt type protective guard(s) installed over the "Parking Brake" knob to prevent accidental activation of the brake. The guard shall be located on the driver's and passenger's side.

ISOLATED BRAKE RELEASE

An additional air tank shall be provided for an isolated emergency brake release. The control shall be located inside the cab within easy reach of the driver.

PARK BRAKE CONTROL (additional)

A second park brake control valve shall be installed on the officer side of the instrument panel. This valve shall only activate the brakes if manually pulled out; low air pressure shall not activate this valve.

COMPRESSION FITTINGS ONLY

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

ENGINE

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

Power:	600 hp at 1800 rpm
Torque:	1850 lb.-ft at 1200 rpm
Governed Speed	2100 rpm
Emissions Level:	EPA 2017
Fuel:	Diesel
Cylinders:	Six (6)
Displacement:	912 cubic inches (14.9L)
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 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.

	Bidder Complies	
	Yes	No

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 fully engaged in "Pump" position.

FAN CLUTCH CONTROL SWITCH

A manual control switch for the fan clutch shall be provided. The switch shall allow manual engagement any time the pump transmission is in "road". The fan clutch shall be in constant engagement when the pump transmission is in "pump" position.

ENGINE START/STOP BUTTON

There shall be two (2) switches provided at the turntable, one (1) switch for engine start and one (1) switch for engine stop. The stop button shall shut down the engine, leaving the ignition switch on in the cab and all ignition circuits live. The ignition control shall be in the tractor cab only.

ENGINE PROGRAMMING

The chassis engine accelerator pedal shall be active when the parking brake is applied.

	Bidder Complies	
	Yes	No

ENGINE AIR INTAKE

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

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

EXHAUST SYSTEM

The exhaust system shall include an aftertreatment device to meet current EPA standards. The exhaust system shall be stainless steel from the turbo to the inlet of the aftertreatment device and shall be 5.00" in diameter. 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.

EXHAUST MODIFICATION

The exhaust pipe shall be brought out from under the body at a 90-degree angle from the truck. The tail pipe shall extend a minimum of 2.00" past the body, adaptable for the Plymovent system. The diameter of the diffuser shall be 7.00". There shall be a clearance of 4.00" completely around the pipe once past the side of the body. A stop shall be provided on the tail pipe that shall prevent the nozzle from sliding too far on.

RADIATOR

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

manufacturer cooling system standards.

For maximum corrosion resistance and cooling performance, the entire radiator core shall be constructed using long life aluminum alloy. The core shall be made of aluminum fins, having a serpentine design, brazed to aluminum tubes. The tubes shall be brazed to aluminum headers. No solder joints or leaded material of any kind shall be acceptable in the core assembly. The radiator core shall have a minimum frontal area of approximately 1,352 square inches. Supply tank made of glass-reinforced nylon and a return tank of cast aluminum alloy shall be crimped on to the core assembly using header tabs and a compression gasket to complete the radiator core assembly. The radiator shall be compatible with commercial antifreeze solutions.

	Bidder Complies	
	Yes	No

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

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

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

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

COOLANT LINES

Rubber hose shall be used for all engine coolant lines to be installed by the chassis manufacturer.

Hose clamps shall be stainless steel constant torque type to prevent coolant leakage. They shall react to temperature changes in the cooling system and expand or contract accordingly while maintaining a constant clamping pressure on the hose.

FUEL TANK

A 65-gallon fuel tank shall be provided and mounted ahead of the rear wheels on the driver's side of the chassis. The tank shall be constructed of 12-gauge, hot rolled steel. It shall be equipped with swash partitions and a vent. To eliminate the effects of corrosion, the fuel tank shall be mounted with stainless steel straps. (no exception).

A .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 rear of the chassis on the vertical portion of the fender skirting area. The inlet shall 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.

Bidder Complies	
Yes	No

DIESEL EXHAUST FLUID TANK

A 10-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 painted 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.

AUXILIARY FUEL PUMP

An auxiliary electric fuel pump shall be added to the fuel line for priming the engine. A switch located on the cab instrument panel shall be provided to operate the pump.

FUEL SHUTOFF

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

FUEL COOLER

An air to fuel cooler shall be installed in the engine fuel return line. The fuel filler door shall include a holder for the fuel fill cap.

DEF FILL DRAIN

A drain shall be added inside the fuel fill door, below the DEF fill inlet. The drain shall be extended down below the body.

LABEL, DEF DOOR

A label, reading "DEF Fluid Only" shall be provided on the outside of the fill door.

LABEL, FUEL DOOR

A label with a bezel, that matches the NEW style pump panel tags, shall be provided, on DEF tank door. It shall read "Ultra Low Sulfur Diesel fuel only".

Bidder Complies	
Yes	No

FUEL SEPARATOR

The engine shall be equipped with an in-line spin-on fuel and water separator in addition to the engine fuel filters.

TRANSMISSION

A deep reduction electronic, torque converting, automatic transmission shall be provided.

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

Two (2) PTO openings shall be located on left side and top of converter housing (positions 8 o'clock and 1 o'clock).

A transmission temperature gauge with red light and buzzer shall be installed on the cab instrument panel.

TRANSMISSION SHIFTER

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

The transmission ratio shall be 1st - 4.70 to 1.00, 2nd - 2.21 to 1.00, 3rd - 1.53 to 1.00, 4th - 1.00 to 1.00, 5th - 0.76 to 1.00, 6th - 0.67 to 1.00, R - 5.55 to 1.00.

TRANSMISSION COOLER

An externally mounted bar plate transmission oil cooler shall be provided using engine coolant to control the transmission oil temperature. The internal bar plates shall be constructed of stainless steel. The cooler's housing shall be constructed of 1020 steel, coated to protect from corrosion. The cooler shall be tagged with information including OEM part number, vendor serial number and date / lot code.

TRANSMISSION PROGRAM

The transmission shall shift to neutral when parking brake is set.

DOWNSHIFT MODE (W/ENGINE BRAKE)

The transmission shall be provided with an aggressive downshift mode.

This shall provide earlier transmission downshifts to 3rd gear from 6th gear, resulting in improved engine braking performance.

	Bidder Complies	
	Yes	No

DRIVELINE

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

The shafts shall be dynamically balanced before installation.

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

GREASE SHIELD

The drive shaft U-joint directly behind the transmission shall be provided with a grease shield to prevent grease from being thrown against the exhaust system.

The drive shaft slip joint requires a grease shield to prevent grease from being thrown against the frame wiring harness.

DRIVELINES

The chassis drivelines shall be fitted with half-round style universal joints.

STEERING

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

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

STEERING WHEEL

The steering wheel shall be 18.00" in diameter, have tilting and telescoping capabilities, and a

4-spoke design.

LOGO AND CUSTOMER DESIGNATION ON DASH

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

The first row of text shall be: East

The second row of text shall be: Pierce

The third row of text shall be: Fire

Bidder Complies	
Yes	No

BUMPER

A one (1) piece, black painted 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.

LIFT AND TOW MOUNTS

Mounted to the frame extension shall be lift and tow mounts. The lift and tow mounts shall be

designed and positioned to adapt to certain tow truck lift systems.

The lift and tow mounts with eyes shall be painted the same color as the frame.

TOW EYES

Two (2) Chicago style tow eyes shall be mounted under the bumper and attached to the front frame members. The inner and outer edges of the tow eyes shall have a 0.25 radius.

The tow eyes 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 eyes shall not be used for lifting of the apparatus.

The tow eyes shall be painted job color.

PORTABLE WINCH RECEIVERS

Three (3) portable winch receivers shall be installed under the front bumper extension of the apparatus. One (1) shall be facing forward and one (1) shall be facing each side of the bumper.

The winch receiver shall be constructed of heavy steel tubing, reinforced to the bumper extension framework for the receiving portion. The winch receivers shall each be rated for 9,000 lb.

A single electrical plug shall be provided under the center of the bumper extension, able to supply power to any receiver.

EXHIBIT B (Tractor Drawn Aerial)

Bidder Complies	
Yes	No

CAB

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

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

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

The cab shall have 12 main vertical structural members located in the A-pillar (front cab corner posts), B-pillar (side center posts), C-pillar (rear corner posts) and rear wall areas. The A-pillar shall be constructed of solid A356-T5 aluminum. The B-pillar and C-pillar shall be constructed from 0.25" heavy wall extrusions. The rear wall shall be constructed of two (2) 4.00" x 2.00" outer aluminum extrusions and two (2) 3.00" x 2.00" inner aluminum extrusions. All main vertical structural members shall run from the floor to 6.50" x 4.875" x 0.1875" thick roof extrusions to provide a cage-like structure with the A-pillar and roof extrusions being welded into a 0.36" thick corner casting at each of the front corners of the roof assembly.

The front of the cab shall be constructed of a 0.25" thick gusset plate, covered with a 0.090" front skin (for a total thickness of 0.34"), and reinforced with a 95.00" wide x 11.13" deep x 0.50" thick cross-cab support located just below the windshield. The cross-cab support shall run the full width of the cab and weld to each A-pillar, the 0.25" thick gusset plate and the front skin.

The cab floors shall be constructed of 0.1875" thick aluminum plate and reinforced at the firewall with an additional 0.50" thick cross-floor support providing a total thickness of 0.6875" of structural material at the front floor area. The front floor area shall also be supported with one (1) 0.50" plate bolted to one (1) 0.78" plate that also provides the mounting point for the cab lift. This tubing shall run from the front of the cab to the 0.187" thick engine tunnel, creating the structure to support the forces created when lifting the cab.

The cab shall be 94.75" wide (outside door skin to outside door skin) to maintain maximum maneuverability (no exception).

The overall height (from the cab roof to the ground) shall be approximately 103.00". The overall height listed shall be calculated based on a truck configuration with the lowest suspension weight ratings, the smallest diameter tires for the suspension, no water weight, no loose equipment weight, and no personnel weight. Larger tires, wheels, and suspension shall increase the overall height listed.

The floor to ceiling height inside the crew cab shall be 54.00" in the center and 59.25" in the outboard positions.

The crew cab floor shall measure 40.12" from rear wall to the back side of engine tunnel.

	Bidder Complies	
	Yes	No

The engine tunnel, at the rearward highest point (knee level), shall measure 47.75" to the back wall.

The crew cab shall be of the totally enclosed design with access doors constructed in the same manner as the driver and passenger doors.

The cab shall be a full tilt cab style.

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

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 constructed of bright polished extruded aluminum and be 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 1.50" insulation in the ceiling and side walls, and 2.00" insulation in the rear wall to maximize acoustic absorption and thermal insulation.

FENDER LINERS

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

WINDSHIELD

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

All cab glass shall be tinted.

WINDSHIELD WIPERS

Two (2) electric windshield wipers with washer shall be provided that meet FMVSS and SAE requirements.

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

GLOVE BOX

A glove box with a drop-down door shall be installed in the front dash panel in front of the officer position.

Bidder Complies	
Yes	No

ENGINE TUNNEL

Engine hood side walls shall be constructed of 0.50" aluminum. The top shall be constructed of 0.19" aluminum and shall be tapered at the top to allow for more driver and passenger elbow room.

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

CAB REAR WALL EXTERIOR COVERING

The entire exterior surface of the rear wall of the cab shall be painted two-tone to match the sides of the cab, with all seams finish welded.

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.

The hydraulic pump shall have a manual override for backup in the event of electrical failure.

The cab tilt master switch shall be located passenger side pump panel, above the removable lower panel, centered top to bottom near the right side of the panel.

In addition to the panel controls, a 15' remote control shall be provided for raising and lowering the cab. The remote control shall be stored in the cab. The receptacle for the remote control shall be located on the passenger side.

The engine shall be easily accessible and capable of being removed with the cab tilted. The cab shall be capable of tilting 45 degrees and 90 degrees with crane assist.

Cab shall be locked down by a 2-point automatic spring-loaded hook mechanism that actuates after the cab has been lowered.

The hydraulic cylinders shall be equipped with a velocity fuse that protects the cab from accidentally descending when the control is located in the tilt position.

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

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.

	Bidder Complies	
	Yes	No

LOCKDOWN INDICATOR

There shall be a weather resistant red LED light provided and located near the cab lift control panel on the passenger side pump panel. The light shall activate when the battery switch is on and the cab is not fully engaged into the lockdown latches.

GRILLE

A bright finished aluminum mesh grille screen, inserted behind a bright finished grille surround, shall be provided on the front center of the cab. Black '113' shall be painted on the grille.

DOOR JAMB SCUFFPLATES

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

SIDE OF CAB MOLDING

Chrome molding shall be provided on both sides of cab.

MIRRORS

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

DOORS

To enhance entry and egress to the cab, the forward cab doors shall be a minimum of 37.50" wide x 74.25" high. The crew cab doors shall be located on the sides of the cab and shall be constructed in the same manner as the forward cab doors. The crew cab doors shall measure a minimum of 34.88" wide x 74.25" high.

The forward cab and crew cab doors shall be constructed of extruded aluminum with a nominal material thickness of 0.125". The exterior door skins shall be constructed from 0.090" aluminum.

Aflush mounted, chrome plated paddle type door handle shall be provided on the exterior of each cab door. Each door shall also be provided with an interior flush paddle handle.

The cab doors shall be provided with both interior (rotary knob) and exterior (keyed) locks as required by FMVSS 206. The locks shall be capable of activating when the doors are open or closed. The doors shall remain locked if locks are activated when the doors are opened, then closed.

	Bidder Complies	
	Yes	No

A 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 and crew cab door.

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

Door Panels

There shall be a full height brushed stainless steel door panel installed on the inside of all cab doors. The cab door panels shall be removable without disconnecting door and window mechanisms.

ELECTRIC OPERATED CAB DOOR WINDOWS

All four (4) cab doors shall be equipped with electric operated windows with one (1) flush mounted automotive style switch on each door. The driver's door shall have four (4) switches, one (1) to control each door window.

Each switch shall allow intermittent or auto down operation for ease of use. Auto down operation shall be actuated by holding the window down switch for approximately 1 second.

ELECTRIC CAB DOOR LOCKS

The front driver and officer doors shall have a door lock master switch. The master switches shall control all cab door locks.

The rear cab doors shall have the standard manual lock control.

There shall be one (1) concealed switch located on the exterior of the cab near the driver’s door.

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 24.75" wide, and the crew cab steps shall be 21.25" wide with an 8.00" minimum depth. The inside cab steps shall not exceed 18.00" in height and be limited to two (2) steps. Three (3) step entrance designs shall not be acceptable due to safety concerns.

Bidder Complies	
Yes	No

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

For reduced overall maintenance costs compared to incandescent lighting, there shall be four (4) white LED step lights provided. The lights shall be installed at each cab and crew cab door, one (1) per step. The lights shall be located in the driver side front doorstep, driver side crew cab doorstep, passenger side front doorstep and passenger side crew cab doorstep.

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

The lights shall be activated when the adjacent door is opened.

FENDER CROWNS

Black fender crowns shall be installed at the cab wheel openings. The fender crowns shall have a radius outside corner that allows the fender crown to extend beyond the side wall of the front tires and allow the crew cab doors to open fully.

FIFTH WHEEL

The fifth wheel shall be designed to allow the tiller trailer to pivot fore & aft and be rotated. The fifth wheel shall also be capable of full operation up to a 14-degree break over angle.

A fifth wheel lockout system shall be provided to limit motion during aerial operations.

The fifth wheel lockout system, when activated, shall prevent movement between the upper and lower plates of the fifth wheel assembly.

In the normal road travel condition the cylinder mounted solenoid valves shall be open and shall allow transfer of oil between the front and rear pair of cylinders.

When the stabilizers are in their proper supporting position and as the aerial leaves the boom support, the solenoid valves shall close.

The closed valves shall allow no oil to be transferred and the fifth wheel assembly shall become rigid.

A fill and a gauge port shall be provided on the top of the trailer goose neck for maintenance.

	Bidder Complies	
	Yes	No

FENDER PANELS

The chassis behind the cab shall be assembled with fender panels over the wheels, running boards and steps for access to the turntable and decking over the frame rails.

The fender panels shall be fabricated of .125"-5052 aluminum with a 38,000-psi tensile strength.

The fenders shall be designed with enough clearance to allow for the use of wrap around tire chains. The fenders radius is 1.50" wider.

Fender design shall be provided for prevention of rust pockets and ease of maintenance. Black fender crowns shall be provided around the rear wheel openings.

A rubber welting shall be provided between the body and the crown to seal the seam and restrict moisture from entering.

A dielectric barrier shall be provided between the fender crown fasteners (screws) and the fender sheet metal to prevent corrosion.

The area over the frame rails between the cab and fifth wheel shall be covered with aluminum treadplate to serve as a walkway area. The walkway area shall be properly reinforced with a steel substructure attached to the frame rails.

Running boards shall be installed on each side directly behind the cab for access to the walkway area behind the cab and the turntable. The running boards shall be covered with aluminum treadplate.

HANDRAIL (FRONT OF CAB)

A 10.00" long x 1.25" diameter, handrail shall be mounted on the front of the cab centered below the windshield. The handrails shall be extruded aluminum with a ribbed design to provide a positive gripping surface.

CAB INTERIOR

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

The engine tunnel shall be padded and covered with 46-ounce leather grain vinyl resistant to oil, grease and mildew.

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

The headliner shall be installed in both forward and rear cab sections. Headliner material shall be vinyl. A sound barrier shall be part of its composition. Material shall be installed on aluminum sheet and securely fastened to interior cab ceiling. Forward portion of cab headliner shall provide easy access for servicing electrical wiring or for other maintenance needs without removing the entire unit.

CAB INTERIOR UPHOLSTERY

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

CAB INTERIOR PAINT

The following metal surfaces shall be painted black, vinyl textured paint:

- Modesty panel in front of driver
- Vertical surface of dash in front of the officer
- Glove box in front of the officer (if applicable)
- Power distribution in front of the officer
- Rear heater vent panels

The remaining cab interior metal surfaces shall be painted fire smoke gray, vinyl texture paint.

CAB FLOOR

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

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

CAB DEFROSTER

There shall be a 41,000 BTU defroster in the cab located under the engine tunnel.

The defroster ventilation shall be built into the design of the cab dash instrument panel and shall be easily removable for maintenance.

The defroster shall have a 3-speed blower and temperature controls accessible to the driver and officer.

The defroster ducts shall be designed to provide maximum defrosting capabilities for the front cab windows.

Bidder Complies	
Yes	No

CAB/CREW CAB HEATER

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

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

AIR CONDITIONING

A high-performance, customized air conditioning system shall be furnished inside the cab and crew cab. A 19.10 cubic inch compressor shall be installed on the engine.

The air conditioning system shall be capable of cooling the average cab temperature from 100 degrees Fahrenheit to 72 degrees Fahrenheit at 50 percent relative humidity within 30 minutes. The cooling performance test shall be run only after the cab has been heat soaked at 100 degrees Fahrenheit for a minimum of 4 hours.

A roof-mounted condenser that meets and exceeds the performance specification shall be installed on the cab roof. Mounting the condenser below the cab or body would reduce the performance of the system and shall not be acceptable. The condenser cover and mounting legs to be painted white as provided by the A/C manufacturer.

An evaporator unit that meets and exceeds the performance specification shall be installed in the cab, located in the center of the cab ceiling over the engine tunnel. The evaporator shall include two (2) high performance cores and plenums with multiple outlets, one (1) plenum directed to the front and one (1) plenum directed to the rear of the cab.

The evaporator unit shall be provided with adjustable air outlets strategically located to direct air flow to the driver, officer and crew cab area.

All hose used shall be class 1 type to reduce moisture ingression into the air conditioning system.

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

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

GRAVITY DRAIN TUBES

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

Bidder Complies	
Yes	No

HEPA FILTER

The filter for both the air conditioner and the defroster shall be high efficiency particulate air filters. As well as cab filtration system to clean cab standards.

AIR CONDITIONING FILTER ACCESS

The air conditioning evaporator filters shall be located on the exterior of the evaporator cover. The filters shall be held in place with easily removable brackets for ease of maintenance.

WINDOW DEFROST FANS

Two (2) window defrost fans shall be mounted on the ceiling of the cab, one (1) on each side of the cab.

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 HANDLE

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

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

ENGINE COMPARTMENT LIGHTS

There shall be two (2) 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 or when the dip stick door is opened.

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.

Bidder Complies	
Yes	No

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 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).

	Bidder Complies	
	Yes	No

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) and one (1) in the tiller cab.

OFFICER SEAT

An air suspension seat shall be provided in the cab for the officer. For optimal comfort, the seat shall be provided with 17.00" deep cushion. The seat back shall be a high back style with an adjustable recline angle. To ensure safe operation, the seat shall be equipped with a sensor in the seat cushion and belt receptacle that shall activate an alarm indicating the seat is occupied but not buckled.

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, then retract the seat to its lowest travel position.

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

	Bidder Complies	
	Yes	No

REAR FACING LEFT SIDE CABINET

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

The cabinet shall be 26.75" wide x 40.25" high x 23.00" deep.

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

The cabinet shall include no louvers.

The cabinet shall provide access only from outside the cab with one (1) double pan door painted to match the cab exterior with a non-locking D-ring latch. The door shall be located on the side of the cab over the wheel well. A pneumatic stay arm shall be provided as a door stop. The clear door opening shall be 17.00" wide x 34.00" high.

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

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

This cabinet will hold scba and bunker gear for the driver.

CABINET LIGHT

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

REAR FACING RIGHT SIDE CABINET

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

The cabinet shall be 19.00" wide x 42.50" high x 24.00" deep. The interior door shall be a roll-up door.

The cabinet shall include adjustable shelves or trays in the cabinet interior.

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

CABINET LIGHT

There shall be one (1) white Amdor LED strip light installed on the right side of the interior cabinet door opening and one (1) white Amdor LED strip light installed on the left side of the interior cabinet door opening. The lights shall be controlled by a rocker switch on the exterior of the cabinet.

Bidder Complies	
Yes	No

STORAGE COMPARTMENTS

Provided on each side of the cab, to the rear of the crew cab access doors, shall be a storage exterior access compartment. The compartments shall be 11.25" wide x 28.00" high x 13.00" deep.

The doors shall be painted aluminum, reverse hinged double pan construction with one (1) D-ring slam latch. A pneumatic stay arm for each exterior door shall be used as a door stop. The stop shall allow the doors to open a minimum of 135 degrees.

The compartment interior shall be painted to match the cab interior.

COMPARTMENT LIGHT

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

SHELVING

There shall be two (2) shelf(s) provided in the cab exterior compartment. Each shelf shall be constructed of 0.090" aluminum with a 1.00" up-turned lip. Shelving shall be infinitely adjustable by means of a threaded fastener sliding in a track.

The shelf(ves) shall be painted spatter gray.

The location shall be auxiliary/transverse compartment.

DOOR FRAME SCUFF PLATE

There shall be two (2) scuff plate(s) provided for the bottom of the door frame of bottom door edge of the exterior cab compartment - match job 30632. Each scuff plate shall be polished stainless steel with a 0.38" lip down.

FORWARD FACING CENTER SEATS

There shall be two (2) forward facing seats provided at the center position in the crew cab. The seats shall be spaced 8.00" apart to provide additional room for each occupant. For optimal comfort, the seats shall be provided with 15.00" deep cushions. To ensure safe operation, the seats shall be equipped with a sensor in the seat cushion and belt receptacle that shall activate an alarm indicating the seat is occupied but not buckled.

The seat backs shall be a back style with a 95-degree fixed recline angle.

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

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

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

SEAT UPHOLSTERY

All seat upholstery shall be 46-ounce leather grain gray vinyl resistant to oil, grease and mildew.

SEAT BELTS

All seating positions in the cab, crew cab and tiller cab (if applicable) shall have red seat belts.

To provide quick, easy use for occupants wearing bunker gear, the female buckle and seat belt webbing length shall meet or exceed the current edition of NFPA 1901 and CAN/ULC - S515 standards.

The 3-point shoulder type seat belts shall also include 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.

SHOULDER HARNESS HEIGHT ADJUSTMENT

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

HELMET STORAGE PROVIDED BY FIRE DEPARTMENT

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

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

CAB DOME LIGHTS

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

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

The white LED's shall be controlled by the door switches and the lens switch.

The color LED's shall be controlled by the lens switch.

In order to ensure exceptional illumination, each white LED dome light shall provide a minimum of 10.1 foot-candles (fc) covering an entire 20.00" x 20.00" square seating position when mounted 40.00" above the seat.

Bidder Complies	
Yes	No

HAND HELD LIGHT

There shall be four (4) Streamlight Valcon hand lights provided with a vehicle mount with 12VDC direct wire charging rack and quick release buckle strap mounted two in crew cab, one near the tillerman and one TBD.

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

CAB INTERIOR

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

COMPUTER MOUNTING

There shall be one (1) computer installation provision(s) installed officer side dash.

GAUGES

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

- Voltmeter Gauge (Volts):
  - Low volts (11.8 VDC)
    - Amber indicator on gauge assembly with alarm
  - High volts (15 VDC)
    - Amber indicator on gauge assembly with alarm
  - Very low volts (11.3 VDC)
    - Amber indicator on gauge assembly with alarm
  - Very high volts (16 VDC)
    - Amber indicator on gauge assembly with alarm

EXHIBIT B (Tractor Drawn Aerial)

	Bidder Complies	
	Yes	No

- Tachometer (RPM)
- Speedometer (Primary (outside) MPH, Secondary (inside) Km/H)
- Fuel Level Gauge (Empty - Full in fractions):
    - Low fuel (1/8 full)
        - Amber indicator on gauge assembly with alarm
    - Very low fuel (1/32) fuel
        - Amber indicator on gauge assembly with alarm
- Engine Oil Pressure Gauge (PSI):
    - Low oil pressure to activate engine warning lights and alarms
        - Red indicator on gauge assembly with alarm
- Front Air Pressure Gauge (PSI):
    - Low air pressure to activate warning lights and alarm
        - Red indicator on gauge assembly with alarm
- Rear Air Pressure Gauge (PSI):
    - Low air pressure to activate warning lights and alarm.
        - Red indicator on gauge assembly with alarm
- Transmission Oil Temperature Gauge (Fahrenheit):
- High transmission oil temperature activates warning lights and alarm
    - Amber indicator on gauge assembly with alarm
- Engine Coolant Temperature Gauge (Fahrenheit):
    - High engine temperature activates an engine warning light and alarm
        - Red indicator on gauge assembly with alarm
- Diesel Exhaust Fluid Level Gauge (Empty - Full in fractions):
    - Low fluid (1/8 full)
        - Amber indicator on gauge assembly with alarm

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

	Bidder Complies	
	Yes	No

INDICATOR LAMPS

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

The following amber telltale lamps shall be present:

- Low coolant
- Trac cntl (traction control) (where applicable)
- Check engine
- Check trans (check transmission)
- Aux brake overheat (Auxiliary brake overheat)
- Air rest (air restriction)
- Caution (triangle symbol)
- Water in fuel
- DPF (engine diesel particulate filter regeneration)
- Trailer ABS (where applicable)
- Wait to start (where applicable)
- HET (engine high exhaust temperature) (where applicable)
- ABS (antilock brake system)
- MIL (engine emissions system malfunction indicator lamp) (where applicable)
- SRS (supplemental restraint system) fault (where applicable)
- DEF (low diesel exhaust fluid level)
- The following red telltale lamps shall be present:
- Warning (stop sign symbol)
- Seat belt
- Parking brake
- Stop engine
- Rack down

	Bidder Complies	
	Yes	No

The following green telltale lamps shall be provided:

- Left turn
- Right turn
- Battery on

The following blue telltale lamp shall be provided:

- High beam

ALARMS

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

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

Alarm silence: Any active audible alarm shall be able to be silenced by holding the ignition switch at the top position **for three (3) to five (5) seconds. For improved safety, silenced audible**

Alarms shall intermittently chirp every 30 seconds until the alarm condition no longer exists. The intermittent chirp shall act as a reminder to the operator that a caution or warning condition still exists. Any new warning or caution condition shall enable the steady or pulsing tones respectively.

INDICATOR LAMP AND ALARM PROVE-OUT

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

CONTROL SWITCHES

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

- Emergency master switch: A molded plastic push button switch with integral indicator lamp shall be provided. Pressing the switch shall activate emergency response lights and siren control. A green lamp on the switch provides indication that the emergency master mode is active. Pressing the switch again disables the emergency master mode.
- Headlight / Parking light switch: A three (3)-position maintained rocker switch shall be provided. The first switch position shall deactivate all parking lights and the headlights. The second switch position shall activate the parking lights. The third switch position shall activate the headlights.

	Bidder Complies	
	Yes	No

- Panel back lighting intensity control switch: A three (3)-position momentary rocker switch shall be provided. The first switch position decreases the panel back lighting intensity to a minimum level as the switch is held. The second switch position is the default position that does not affect the back-lighting intensity. The third switch position increases the panel back lighting intensity to a maximum level as the switch is held.

The following standard controls shall be integral to the gauge assembly and are located below the right-hand gauges. All switches have backlit labels for low light applications:

- High idle engagement switch: A two (2)-position momentary rocker switch with integral indicator lamp shall be provided. The first switch position is the default switch position. The second switch position shall activate and deactivate the high idle function when pressed and released. The "Ok To Engage High Idle" indicator lamp must be active for the high idle function to engage. A green indicator lamp integral to the high idle engagement switch shall indicate when the high idle function is engaged.
- "Ok To Engage High Idle" indicator lamp: A green indicator light shall be provided next to the high idle activation switch to indicate that the interlocks have been met to allow high idle engagement.
- The following standard controls shall be provided adjacent to the cab gauge assembly within easy reach of the driver. All switches shall have backlit labels for low light applications.
- Ignition switch: A three (3)-position maintained/momentary rocker switch shall be provided. The first switch position shall deactivate vehicle ignition. The second switch position shall activate vehicle ignition. The third momentary position shall disable the audible alarm if held for three (3) to five (5) seconds. A green indicator lamp shall be activated with vehicle ignition.
- Engine start switch: A two (2)-position momentary rocker switch shall be provided. The first switch position is the default switch position. The second switch position shall activate the vehicle's engine. The switch actuator is designed to prevent accidental activation.
- 4-way hazard switch: A two (2)-position maintained rocker switch shall be provided. The first switch position shall deactivate the 4-way hazard switch function. The second switch position shall activate the 4-way hazard function. The switch actuator shall be red and includes the international 4-way hazard symbol.
- Turn signal arm: A self-canceling turn signal with high beam headlight and windshield wiper/washer controls shall be provided. The windshield wiper control shall have high, low, and intermittent modes.
- Parking brake control: An air actuated push/pull park brake control valve shall be provided.
- Chassis horn control: Activation of the chassis horn control shall be provided through the center of the steering wheel.

Bidder Complies	
Yes	No

CUSTOM SWITCH PANELS

The design of cab instrumentation shall allow for emergency lighting and other switches to be placed within easy reach of the operator thus improving safety. There shall be positions for up to three (3) switch panels in the overhead console on the driver's side, up to four (4) switch panels in the engine tunnel console facing the driver, up to three (3) switch panels in the overhead console on the officer's side and up to three (3) switch panels in the engine tunnel rear facing console accessible to both driver and officer. All switches shall have backlit labels for low light applications.

DIAGNOSTIC PANEL

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

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

CAB LCD DISPLAY

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

Bidder Complies	
Yes	No

AIR RESTRICTION INDICATOR

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

"DO NOT MOVE APPARATUS" INDICATOR

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

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

DO NOT MOVE TRUCK MESSAGES

Messages shall be displayed on the color display located within sight of the driver whenever the Do Not Move Truck light is active. The messages shall designate the item or items not in the stowed for vehicle travel position (parking brake disengaged).

The following messages shall be displayed (where applicable):

- Do Not Move Truck
- DS Cab Door Open (Driver Side Cab Door Open)
- PS Cab Door Open (Passenger's Side Cab Door Open)
- DS Crew Cab Door Open (Driver Side Crew Cab Door Open)
- PS Crew Cab Door Open (Passenger's Side Crew Cab Door Open)
- DS Body Door Open (Driver Side Body Door Open)
- PS Body Door Open (Passenger's Side Body Door Open)
- Rear Body Door Open
- Aerial Not Stowed (Aerial Device Not Stowed)
- Stabilizer Not Stowed
- Steps Not Stowed
- Handrail Not Stowed

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

Bidder Complies	
Yes	No

SWITCH PANELS

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

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

The switches shall be membrane-type and act as an integral indicator light. For quick, visual indication the entire surface of the switch shall be illuminated white whenever back lighting is activated and illuminated green whenever the switch is active. An active illuminated switch shall flash when interlock requirements are not met, or device is actively being load managed. For ease of use, a two (2)-ply, scratch resistant laser engraved label indicating the use of each switch shall be placed in the center of the switch. The label shall allow light to pass through the letters for ease of use in low light conditions.

WIPER CONTROL

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

HOURMETER - AERIAL DEVICE

An hour meter for the aerial device shall be provided and located within the cab display or instrument panel.

AERIAL MASTER

There shall be a master switch for the aerial operating electrical system provided.

	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 30 amps at 12 volts DC.

Power and ground shall terminate behind the officer's seat.

Termination shall be to a 12 circuit with negative bus bar. The terminal block shall include a cover with circuit labels.

Wires shall be sized to 125% of the protection.

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

SPARE CIRCUIT

There shall be one (1) 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's dash area (tablet).
- 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.

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 30 amps at 12 volts DC.

	Bidder Complies	
	Yes	No

Power and ground shall terminate behind the driver's seat.

Termination shall be to a 12 circuit with negative bus bar. The terminal block shall include a cover with circuit labels.

Wires shall be sized to 125% of the protection.

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

SPARE CIRCUIT

There shall be one (1) 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 between the forward-facing crew cab seats (exact location to be determined).
- 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.

SPARE CIRCUIT

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

The above wires shall have the following features:

- The positive wire shall be connected directly to the battery power
- The negative wire shall be connected to ground
- Wires shall be protected to 15 amps at 12 volts DC
- Power and ground shall terminate in EMS compartment(s)
- Termination shall be with heat shrinkable butt splicing
- Wires shall be sized to 125 percent of the protection

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

EXHIBIT B (Tractor Drawn Aerial)

	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 30 amps at 12 volts DC
- Power and ground shall terminate officer side dash area
- Termination shall be with heat shrinkable butt splicing
- Wires shall be sized to 125% of the protection

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

SPARE CIRCUIT

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

The above wires shall have the following features:

- The positive wire shall be connected directly to the battery power.
- The negative wire shall be connected to ground.
- Wires shall be protected to 40 amps at 12 volts DC.
- Power and ground shall terminate P5 upper tank wall (E-Draulic tools).
- Termination shall be to a 6 circuit with negative bus bar. The terminal block shall include a cover with circuit labels.

Wires shall be sized to 125% of the protection.

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

INFORMATION CENTER

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

The information center shall have the following specifications:

- Operate in temperatures from -40 to 185 degrees Fahrenheit
- An Optical Gel shall be placed between the LCD and protective lens
- Five weather resistant user interface switches
- Grey with black accents
- Sunlight Readable
- Linux operating system
- Minimum of 1000nits rated display
- Display can be changed to an available foreign language

	Bidder Complies	
	Yes	No

- An LCD display integral to the cab gauge panel shall be included as outlined in the cab instrumentation area.
- Programmed to read US Customary

GENERAL SCREEN DESIGN

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

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

- An amber background/text color shall indicate a caution condition
- A red background/text color shall indicate a warning condition
- The information center shall utilize an "Alert Center" to display text messages for audible alarm tones. The text messages shall be written to identify the item(s) causing the audible alarm to sound. If more than one (1) text message occurs, the messages shall cycle every second until the problem(s) have been resolved. The background color for the "Alert Center" shall change to indicate the severity of the "warning" message. If a warning and a caution condition occur simultaneously, the red background color shall be shown for all alert center messages.
- A label for each button shall exist. The label shall indicate the function for each active button for each screen. Buttons that are not utilized on specific screens shall have a button label with no text or symbol.

HOME/TRANSIT SCREEN

This screen shall display the following:

- Vehicle Mitigation (if equipped)
- Water Level (if the water level system includes compatible communications to the information center)
- Foam Level (if the foam level system includes compatible communications to the information center)
- Seat Belt Monitoring Screen Seat Belt Monitoring Screen
- Tire Pressure Monitoring (if equipped)
- Digital Speedometer
- Active Alarms

Bidder Complies	
Yes	No

ON SCENE SCREEN

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

- Battery Voltage
- Fuel
- Oil Pressure
- Coolant Temperature
- RPM

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

VIRTUAL BUTTONS

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

PAGE SCREEN

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

- Diagnostics
    - Faults
        - Listed by order of occurrence
        - Allows to sort by system
    - Interlock
        - Throttle Interlocks
        - Pump Interlocks (if equipped)
        - Aerial Interlocks (if equipped)
        - PTO Interlocks (if equipped)
    - Load Manager
        - A list of items to be load managed shall be provided. The list shall provide a description of the load.
        - The lower the priority numbers the earlier the device shall be shed should a low voltage condition occur.
        - The screen shall indicate if a load has been shed (disabled) or not shed.
        - "At a glance" color features are utilized on this screen.

EXHIBIT B (Tractor Drawn Aerial)

	Bidder Complies	
	Yes	No

- Systems
  - Systems Modules
    - Module type and ID number
    - Module Version
    - Input or output number
    - Circuit number connected to that input or output
    - Status of the input or output
    - Power and Constant Current module diagnostic information
  - Foam (if equipped)
  - Pressure Controller (if equipped)
  - Generator Frequency (if equipped)
- Live Data
  - General Truck Data

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

Bidder Complies	
Yes	No

- Steps (if applicable)
  - Notifications
    - View Active Alarms
- Shows a list of all active alarms including date and time of the occurrence is shown with each alarm
- Silence Alarms - All alarms are silenced
  - Timer Screen
  - HVAC (if equipped)
  - Tire Information (if equipped)
  - Aerial Set Up Confirmation (if equipped)

Button functions and button labels may change with each screen.

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

EXHIBIT B (Tractor Drawn Aerial)

Bidder Complies	
Yes	No

SEAT BELT MONITORING SYSTEM

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

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

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

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

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

INTERCOM SYSTEM

A wireless and wired intercom system shall be provided with a charging drop for the driver, officer and tiller. The (2) Two crew cab positions (at both forward facing seats) shall have a wireless and a wired intercom position with charging drop provided. (Total of two (2) wired and three (3) wireless headsets provided)

RADIO / INTERCOM INTERFACE CABLE

The apparatus manufacturer shall supply and install one (1) radio interface cable before delivery of the vehicle.

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

- Motorola High Power, Model 5000 series

UNDER THE HELMET RADIO TRANSMIT HEADSET

There shall be three (3) under helmet wireless, radio transmit headset(s) provided driver, officer and tiller seat.

Each headset shall feature:

- Dual-speaker headset with a noise reduction rating of 24dB
- Push-to-transmit button & volume control in the headset cup
- Cut-away ear cups allow headset to be worn under most helmets
- Waterproof, flexible-boom microphone
- Gel ear seals

	Bidder Complies	
	Yes	No

WIRELESS INTERCOM HEADSET

There shall be three (3) wireless headsets provided. (Locations Driver, Officer and Tiller).

Each headset shall feature:

- Dual-speaker headset with a noise reduction rating of 24dB
- Volume controls
- Bluetooth
- Instant on, auto off
- Mobile radio, portable radio push to talk buttons
- Cut-away ear cups allow headset to be worn under most helmets
- Waterproof, flexible-boom microphone

HEADSET HANGERS

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

GPS / MULTIMODE ANTENNA INSTALLATION

There shall be one (1) customer supplied GPS / Multimode antenna(s) with stud mount for thick roof material to be installed on the roof. The antenna coax cable(s) shall be run per the packing list / instructions provided to the third-party installer.

Specific shipping requirements shall be followed. The GPS / Multimode antenna shall be sent to the apparatus manufacturers preferred installer prior to cab fabrication.

TWO WAY RADIO INSTALLATION

There shall be one (1) customer supplied two-way radio(s) sent to the apparatus manufacturers

preferred radio installer to be installed officer's overhead per the shipping document.

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

Specific radio shipping requirements shall be followed.

RADIO ANTENNA MOUNT

There shall be two (2) standard 1.125", 18 thread antenna-mounting base(s) installed one (1) on the left side and one (1) on the right side on the cab roof with high efficiency, low loss, coaxial cable(s) routed to the instrument panel area. A weatherproof cap shall be installed on the mount.

	Bidder Complies	
	Yes	No

VEHICLE CAMERA SYSTEM

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

- One (1) camera located at the rear of the apparatus, pointing rearward, displayed automatically with the vehicle in reverse

The camera images shall be displayed on the driver's vehicle information center display. Audio from the microphone on the active camera shall be emitted by an amplified speaker with volume control located behind the driver seat.

ELECTRICAL POWER CONTROL SYSTEM

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

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

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

	Bidder Complies	
	Yes	No

SOLID-STATE CONTROL SYSTEM

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

The control system shall operate as a master-slave system whereas the main control module instructs all other system components. The system shall contain patented Mission Critical

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

For increased reliability and simplified use, the control system modules shall include the following attributes:

- Green LED indicator light for module power
- Red LED indicator light for network communication stability status
- Control system self-test at activation and continually throughout vehicle operation
- No moving parts due to transistor logic
- Software logic control for NFPA mandated safety interlocks and indicators
- Integrated electrical system load management without additional components
- Integrated electrical load sequencing system without additional components
- Customized control software to the vehicle's configuration
- Factory and field re programmable to accommodate changes to the vehicle's operating parameters
- Complete operating and troubleshooting manuals
- USB connection to the main control module for advanced troubleshooting

To assure long life and operation in a broad range of environmental conditions, the solid-state control system modules shall meet the following specifications:

- Module circuit board shall meet SAE J771 specifications
- Operating temperature from -40C to +70C
- Storage temperature from -40C to +70C
- Vibration to 50g

IP67 rated enclosure (Totally protected against dust and also protected against the effect of temporary immersion between 15 centimeters and one (1) meter)

Operating voltage from eight (8) volts to 16 volts DC

The main controller shall activate status indicators and audible alarms designed to provide warning of problems before they become critical.

Bidder Complies	
Yes	No

CIRCUIT PROTECTION AND CONTROL DIAGRAM

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

ON-BOARD ADVANCED/VISUAL ELECTRICAL SYSTEM DIAGNOSTICS

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

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

All control system modules, with the exception of the main control module, shall contain onboard visual diagnostic LEDs that assist in troubleshooting. The LEDs shall be enclosed within the sealed, transparent module housing near the face of the module. One LED for each input or output shall be provided and shall illuminate whenever the respective input or output is active. Color-coded labels within the modules shall encompass the LEDs for ease of identification. The LED indicator lights shall provide point of use information for reduced troubleshooting time without the need for an additional computer.

TECH MODULE WITH WIFI

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

The module shall transmit a password protected web page to a Wi-Fi enabled device (i.e. most smart phones, tablets or laptops) allowing two levels of user interaction. The firefighter level shall allow vehicle monitoring of the vehicle and firefighting systems on the apparatus. The technician level shall allow diagnostic access to inputs and outputs installed on the control and information system.

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

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

Bidder Complies	
Yes	No

PROGNOSTICS

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

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

Prognostics shall include:

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

ADVANCED DIAGNOSTICS

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

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

INDICATOR LIGHT AND ALARM PROVE-OUT SYSTEM

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

VOLTAGE MONITOR SYSTEM

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

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

DEDICATED RADIO EQUIPMENT CONNECTION POINTS

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

- The studs shall consist of the following:
- 12-volt 40-amp battery switched power
- 12-volt 60-amp ignition switched power
- 12-volt 60-amp direct battery power

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

ENHANCED SOFTWARE

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

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

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

EMI/RFI PROTECTION

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

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

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

Bidder Complies	
Yes	No

ELECTRICAL

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

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

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

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

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

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

	Bidder Complies	
	Yes	No

BATTERY SYSTEM

Six (6) 12-volt group 3 batteries that include the following features shall be provided:

- 950 CCA (cold cranking amps)
- 195 reserve capacity
- High cycle
- Maintenance free
- Rating of 5700 CCA at 0 degrees Fahrenheit
- 1170 minutes of reserve capacity
- Threaded studs

BATTERY SYSTEM

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

MASTER BATTERY SWITCH

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

BATTERY COMPARTMENTS

Batteries shall be stored in well-ventilated compartments that are located under the cab and bolted directly to the chassis frame. The battery compartments shall be constructed of unpainted 0.188" stainless steel plate and be designed to accommodate a maximum of three (3) group 31 batteries in each compartment. The battery hold-downs shall be of a non-corrosive material. All bolts and nuts shall be stainless steel.

The compartments shall include formed fit heavy-duty roto-molded polyethylene battery trays with drain tubes for the batteries to sit in.

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

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

JUMPER STUDS

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

	Bidder Complies	
	Yes	No

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 near the driver's seat riser with special bracketry.

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.

SHORELINE INLET POWERED

A green LED indicator light mounted to the left of the shore line inlet shall be provided. The light shall indicate when the shoreline inlet has been powered with 120 VAC.

GENERATOR TO SHORELINE TRANSFER SWITCH

There shall be an automatic transfer switch between the onboard generator and the shoreline inlet. The loads connected to the transfer switch shall be power from the onboard generator when the generator is running.

Bidder Complies	
Yes	No

ELECTRIC POWER FOR WINCH

Electric power provisions shall be furnished for the portable winch from the chassis battery system.

The receiver plug shall be located one center of front bumper and one on each end of the front bumper.

A total quantity of three (3) receptacles shall be provided.

ALTERNATOR

An alternator shall be provided that has a rated output current of 430 amps, as measured by SAE method J56. The alternator shall feature an integral regulator and rectifier system that has been tested and qualified to an ambient temperature of 257 degrees Fahrenheit (125 degrees Celsius). The alternator shall be connected to the power and ground distribution system with heavy-duty cables sized to carry the full rated alternator output.

ELECTRONIC LOAD MANAGER

An electronic load management (ELM) system shall be provided that monitors the vehicles 12-volt electrical system, automatically reducing the electrical load in the event of a low voltage condition, and automatically restoring the shed electrical loads when a low voltage condition expires. This ensures the integrity of the electrical system.

For improved reliability and ease of use, the load manager system shall be an integral part of the vehicle's solid-state control system requiring no additional components to perform load management tasks. Load management systems which require additional components shall not be allowed.

The system shall include the following features:

- System voltage monitoring.
- A shed load shall remain inactive for a minimum of five minutes to prevent the load from cycling on and off.
- Sixteen available electronic load shedding levels.
- Priority levels can be set for individual outputs.
- High Idle to activate before any electric loads are shed and deactivate with the service brake.
    - If enabled:
        - "Load Man Hi-Idle On" shall display on the information center.
        - Hi-Idle shall not activate until 30 seconds after engine start up.
- Individual switch "on" indicator to flash when the particular load has been shed.
- The information center indicates system voltage.

Bidder Complies	
Yes	No

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

- Load managed items list, with priority levels and item condition.
- Individual load managed item condition:
  - ON = not shed
  - SHED = shed

SEQUENCER

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

For improved reliability and ease of use, the load sequencing system shall be an integral part of the vehicle's solid-state control system requiring no additional components to perform load sequencing tasks. Load sequencing systems which require additional components shall not be allowed.

Emergency light sequencing shall operate in conjunction with the emergency master light switch. When the emergency master switch is activated, the emergency lights shall be activated one by one at half-second intervals. Sequenced emergency light switch indicators shall flash while waiting for activation.

When the emergency master switch is deactivated, the sequencer shall deactivate the warning light loads in the reverse order.

Sequencing of the following items shall also occur, in conjunction with the ignition switch, at half-second intervals:

- Cab Heater and Air Conditioning
- Crew Cab Heater (if applicable)
- Crew Cab Air Conditioning (if applicable)
- Exhaust Fans (if applicable)
- Third Evaporator (if applicable)

HEADLIGHTS

There shall be four (4) rectangular LED lights mounted in the front quad style chrome housing on each side of the cab grille:

- the outside light on each side shall contain a low beam module
- the inside light on each side shall contain a high beam module

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

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

INTERMEDIATE LIGHT
There shall be two (2) 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.

DIRECTIONAL LIGHTS

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

- Three (3) amber LED identification lights shall be installed in the center of the cab above the windshield.
- Two (2) amber LED clearance lights shall be installed, one (1) on each outboard side of the cab above the windshield.
- Two (2) amber LED marker lights shall be installed, one (1) on each side above the cab doors.

The lights shall be mounted with no guard.

FRONT CAB SIDE DIRECTIONAL/MARKER LIGHTS
There shall be two (2) amber LED lights installed to the outside of the chrome wrap around bezel, one (1) on each side of the cab.

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

REAR CLEARANCE/MARKER/ID LIGHTING
There shall be three (3) LED lights used as identification lights located at the rear of the apparatus per the following:

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

EXHIBIT B (Tractor Drawn Aerial)

	Bidder Complies	
	Yes	No

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 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.

MARKER LIGHTS

There shall be one (1) pair of amber and red LED marker lights with rubber arm, located rear of trailer, horizontally even to the bottom corner of the trailer. The amber lens shall face the front and the red lens shall face the rear of the truck.

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

REAR FMVSS LIGHTING

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

- 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.

TILLER CORNERING LIGHTS

There shall be four (4), 3.18" high x 7.25" long X 1.25" deep lights with white LED and chrome trim installed per the following:

- One (1) light installed on the left side in front of the trailer axle
- One (1) light installed on the left side behind the trailer axle
- One (1) light installed on the right side behind the trailer axle
- One (1) light installed on the right side in front of the trailer axle

The lights shall be activated by the directional switch on the tiller cab steering column and the chassis directional light circuit.

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 one (1) 6.00" oval LED 12-volt DC weatherproof light with grommet provided under the passenger's side pump panel running boards.

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

Bidder Complies	
Yes	No

BODY PERIMETER SCENE LIGHTS

There shall be a total of four (4) 6.00" x 2.00" oval LED lights with grommets provided.

The lights shall be mounted in the following locations:

- One (1) light shall be provided under the driver's side turntable access steps.
- One (1) light shall be provided under the driver's side tiller cab access steps.
- One (1) light shall be provided under the passenger's side tiller cab access steps.
- One (1) light shall be provided under the passenger's side turntable access steps.

The perimeter scene lights shall be activated by a switch within reach of the driver is activated, the parking brake is applied, the driver's side directional is activated, activating only the driver side facing perimeter lights and the passenger's side directional is activated, activating only the passenger side facing perimeter lights.

ADDITIONAL PERIMETER LIGHTS

There shall be six (6) lights in addition to the normal body perimeter lights installed under LS1, LS3, LS5, RS1, RS3, RS5.

These additional lights shall be 6.00" oval white LED light(s) with rubber grommet(s).

STEP LIGHTS

There shall be a total of sixteen (16) white LED step lights provided for access to the tiller cab and turntable.

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 step lights shall be activated with the battery switch is on and the parking brake is applied.

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

SCENE LIGHTS

There shall be one (1) pair of LED scene lights installed on the rear exterior wall of the tractor cab with chrome flanges.

The lights shall be controlled by the aerial master switch.

12 VOLT LIGHTING

There shall one (1) Whelen® Model P*H2*, 17,750 lumens 12-volt DC LED light(s) with a combination of flood and spot optics installed in bail bracket(s) mounted on a visor bracket located above the rear window on the tiller cab, back of tiller cab as high as possible without going above the roofline

The painted parts of this light assembly to be black

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

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

This light installation shall include a housing for the floodlight(s) and mount the rear identification lights.

12 VOLT LIGHTING

There shall be one (1), 12-volt LED floodlight(s) installed in bail bracket(s) located above the side window on the tiller cab, PS of tiller cab above the door.

The painted parts of this light assembly to be black.

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

- a switch at the driver's side switch panel.
- a switch at the passenger's side switch panel.
- no additional switch location.
- a switch in the tiller cab.

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

12 VOLT LIGHTING

There shall be one (1), 12-volt LED floodlight(s) installed in bail bracket(s) located above the side window on the tiller cab, DS of tiller cab above the door.

The painted parts of this light assembly to be black.

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

- a switch at the driver's side switch panel.
- a switch at the passenger's side switch panel.
- no additional switch location.
- a switch in the tiller cab.

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

CENTERING LIGHT

A collapsible centering light shall be provided on the crew cab roof. The light shall be a "boat" type light mast which shall be approximately 12.00" tall with an internal spring. The light shall be mounted at the center rear of the crew cab and shall be used by the tillerman to center the tiller trailer on the chassis. The light shall be wired to the headlight switch.

	Bidder Complies	
	Yes	No

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 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.

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

12 VOLT DC SCENE LIGHTS

There shall be two (2), 8,875 lumens 12-volt DC powered lights with white LEDs and a combination of flood and spot optics installed on the apparatus located, passenger's side of trailer, above P3 and P5.

The light(s) to be installed with an adjustable locking pedestal mount(s) with handle(s).

The painted parts of this light assembly to be black.

The lights shall be activated by a switch at the driver's side switch panel and by a switch at the passenger's side switch panel.

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

12 VOLT DC SCENE LIGHTS

There shall be one (1) 8,875 lumens 12-volt DC powered lights with white LEDs and a combination of flood and spot optics installed on the apparatus located, driver's side of trailer, over D3 and D5.

The light(s) to be installed with an adjustable locking pedestal mount(s) with handle(s).

The painted parts of this light assembly to be black.

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

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

DECK LIGHTS

There shall be two (2) 12-volt DC LED floodlights at the rear of the trailer one (1) each side of tiller cab.

The lights shall be activated by a control from a switch in the tiller cab

REAR SCENE LIGHT(S)

There shall be two (2) LED scene light(s) PS & DS high on the rear of the body.

The light(s) shall be controlled from the driver's side body scene light control.

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

	Bidder Complies	
	Yes	No

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

It shall have a capacity of 300 gallons and shall be constructed of polypropylene plastic in a rectangular shape.

The water tank shall be mounted directly above the water pump.

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

The tank shall be baffled in accordance with NFPA Bulletin 1901 requirements.

The baffles shall have vent openings at both the top and bottom of each baffle to permit movement of air and water between compartments.

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

The transverse partitions extend from 4" off the bottom to the underside of the top cover.

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

The 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.

It shall be 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 of the dowels shall be drilled and tapped (.50" diameter, 13.00" deep) to accommodate lifting eyes.

A sump shall be provided at the bottom of the water tank. The sump shall include a drain plug and the tank outlet.

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

A heavy-duty water tank restraint shall be provided.

Sufficient crossmembers are provided to properly support bottom of tank.

Crossmembers are constructed of steel bar channel or rectangular tubing.

Bidder Complies	
Yes	No

Tank "floats" 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 are provided to prevent an empty tank from bouncing excessively while moving vehicle.

Tank mounting system is approved by the 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.

HOSE BED

650’ of 2.5” Supply

The hose body shall be fabricated of .125"-5052 aluminum with a nominal 38,000 psi tensile strength.

Hose removal shall be at left side of the body below the tiller cab whenever compartmentation is not selected in place of the "chute". A lift-up smooth aluminum door shall be provided at the rear. The hose bed shall be fully enclosed with access through the lift up door and two (2) lift up side doors on the driver’s side rear of the trailer.

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 .50" x 4.50" with spacing between slats for hose ventilation.

Hose capacity shall be 650' x 2.50" DJRL hose. It shall be the two (2) drivers’ side

rear upper compartments with lift up doors. (See compartment description) Scuff

plates to cover bottom lip to protect paint.

AERIAL HOSE BED HOSE RESTRAINT

The hose in the hose bed shall be restrained by one (1) black nylon hook and loop strap at the top of the hose bed. The strap shall be installed to the top of the hose bed side sheets.

	Bidder Complies	
	Yes	No

RUNNING BOARDS

The running boards shall be fabricated of 0.125" bright aluminum treadplate and supported by structural steel angle assemblies bolted to the chassis frame rails.

Running boards shall be 13.00" deep and are spaced away from the body 0.50".

A splash guard shall be provided to keep road dirt or water from splashing up onto the pump panels.

The running boards shall have a riser on the body to protect the painted surface from damage by stepping on the running boards.

The entire surface of the running boards shall be covered with bright aluminum treadplate.

SMOOTH ALUMINUM REAR WALL

The rear wall shall be smooth aluminum.

TOW EYES

Two (2) 10,000 lb. rated rear painted tow eyes shall be located at the rear of the apparatus and shall be mounted directly to the torque box. The inner and outer edges of the tow eyes shall be radiused.

COMPARTMENTATION

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

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

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

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

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

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

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.

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

	Bidder Complies	
	Yes	No

A support system shall be used which shall incorporate a floating substructure by using Neoprene Elastomer isolators to allow the body to remain rigid while the chassis goes through its natural flex. The isolators shall have a broad range of proven viability in vehicular applications, be of a failsafe design, and allow for all necessary movement in three (3) transitional and rotational modes. This shall result in a 500 lb. equipment rating for each lower compartment of the body.

The compartmentation shall include 3.00” steel support assemblies which are bolted to the chassis frame rails. A steel framework shall be mounted to the body above these support assemblies connected to the support assemblies with isolators. There shall be one (1) support assembly mounted to each chassis frame rail.

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

All body compartments shall have a minimum of one (1) set of louvers stamped into a wall to provide the proper airflow inside the compartment and to prevent water from dripping into the compartment. These louvers shall be formed into the metal and not added to the compartment as a separate plate.

TRACTOR COMPARTMENTS (Drivers and Officer Side)

A compartment shall be provided just to the rear of the pump panel and ahead of the tractor fifth wheel with the crosslay hose loads above. The crosslay hose loads shall have a tarp covering the loads with bungie material holding in place. The black tarp shall have ‘Ladder 113’ stitched onto the face. (See crosslay description) The compartment on the driver's side shall be approximately 30.00" wide x 37.75" high x 8.00" deep with a door opening of 25.50" wide x 31.25" high.

The compartment on the passenger's side shall be approximately 30.00" wide x 36.75" high x 8.00" deep. The door opening shall be 25.50" wide x 30.25" high. The floor of this compartment shall be raised 1.00" to allow for proper clearance from exhaust components.

The transverse section shall be approximately 19.38" wide x 15.50" high.

The compartment shall be fabricated out of smooth aluminum painted job color. Bright aluminum treadplate shall be provided on the top of the compartment.

The compartment shall be furnished with a vertically hinged, lap style compartment door on each side that have a D handle latch and positive door hold open device.

EXHIBIT B (Tractor Drawn Aerial)

	Bidder Complies	
	Yes	No

DRIVER SIDE COMPARTMENTATION

Driver side compartmentation shall consist of one large compartment.

The compartment shall be approximately 69.63" wide x 55.63" high x 24.50" deep, with a door opening of approximately 61.25" wide x 47.75" high.

The upper 38.75" of each compartment shall be transverse to the passenger side front compartmentation.

This compartment shall have a roll-up door.

Two (2) compartments shall be provided in the center body section on the driver side. Each compartment shall be full-height.

The forward compartment shall be 47.13" wide x 55.63" high x 24.50" deep with a door opening of 39.00" wide x 47.75" high.

The upper 38.75" of the forward compartment shall be transverse to the passenger side front compartmentation.

The rear compartment shall be 44.50" wide x 55.63" high x 24.50" deep with a door opening of 39.00" wide x 47.75" high.

Both compartments shall have roll-up doors.

Two (2) compartments shall be provided in the rear body section on the driver side.

The forward compartment shall be 69.00" wide x 24.13" high x 24.50" deep, with a door opening of 63.50" wide x 18.75" high. This compartment shall be located ahead of the rear wheels.

The rearward compartment shall be 49.00" wide x 21.00" high x 12.00" deep with a door opening of 43.50" wide x 13.25" high. The floor of this compartment shall be raised approximately 3.00" from standard to increase the rear angle of departure. This compartment shall be located behind the rear wheels.

Both compartments shall have roll-up doors.

A hose storage area shall be provided above the compartmentation. Two (2) lift-up doors shall be provided for access to the hosebed with access through the rear with a flip up door. Bottom edge of the side compartments shall be trimmed with a bright aluminum extruded rub rail to protect the paint.

Bidder Complies	
Yes	No

PASSENGER SIDE COMPARTMENTATION

Passenger side compartmentation shall consist of one large compartment.

The compartment shall be approximately 69.63" wide x 55.63" high x 24.50" deep, with a door opening of approximately 61.25" wide x 46.75" high.

The upper 38.75" of each compartment shall be transverse to the driver's side front compartmentation.

This compartment shall have a roll-up door.

Two (2) compartments shall be provided in the center body section on the passenger side. Each compartment shall be full-height.

The forward compartment shall be approximately 47.13" wide x 55.63" high x 24.50" deep with a door opening of approximately 38.75" wide x 46.75" high.

The upper 38.75" of the forward compartment shall be transverse to the driver side front compartmentation.

The rear compartment shall be approximately 44.50" wide x 55.63" high x 24.50" deep with a door opening of approximately 38.75" wide x 46.75" high.

Both compartments shall have roll-up doors.

Four (4) compartments shall be provided in the rear body section on the passenger side.

The forward compartment shall be 69.00" wide x 24.13" high x 24.50" deep, with a door opening of 63.50" wide x 18.75" high. This compartment shall be located ahead of the rear wheels. This compartment shall be located ahead of the rear wheels and shall have a roll-up door.

The two (2) upper compartments shall be 64.50" wide x 19.75 high x 12.00" deep with a clear door opening of 60.00" wide x 15.25 high. Each compartment shall be provided with a lift-up door. Each lift-up door shall be provided with a cylinder that allows it to open approximately 120 degrees.

The rearward compartment shall be 49.00" wide x 38.50" high x 12.00" deep with a door opening of 43.50" wide x 38.50" high. The floor of this compartment shall be raised approximately 3.00" from standard to increase the rear angle of departure. This compartment shall be located behind the rear wheels. This compartment shall have a roll-up door.

ROLL-UP DOOR, SIDE COMPARTMENTS (Tractor and Trailer

There shall be12 roll up compartment doors installed on the side compartments of the tractor and trailer (10 on the trailer and 2 on the tractor), double faced, aluminum construction and painted one (1) color to match the lower portion of the body.

EXHIBIT B (Tractor Drawn Aerial)

	Bidder Complies	
	Yes	No

Door(s) shall be constructed using 1.00" extruded double wall aluminum slats which will feature a flat smooth interior surface to provide maximum protection against equipment hang-up. The slats shall be connected with a structural driven ball and socket hinge designed to provide maximum curtain diaphragm strength. Mounting and adjusting the curtain shall be done with a clip system that connects the curtain to the balancer drum allowing for easy tension adjustment without tools. The slats shall be mounted in reusable slat shoes with positive snap-lock securement.

Each slat will incorporate weather tight recessed dual durometer seals. One (1) fin will be designed to locate the seal within the extrusion. The second will serve as a wiping seal which will also allow for compression to prevent water ingression.

The doors shall be mounted in a one (1)-piece aluminum side frame with recessed side seals to minimize seal damage during equipment deployment. All seals including side frames, top gutters and bottom panel are to be manufactured utilizing non-marring materials.

Bottom panel flange of roll-up door will be equipped with two (2) cut-outs to allow for easier access with gloved hands.

A stainless-steel lift bar to be provided for opening the door and located at the bottom of each door with latches on the outer extrusion of the door frame. A ledge to be supplied over lift bar for additional area to aid in closing the door. The lift bar shall be located at the bottom of door with striker latches installed at the base of the side frames. Side frame mounted door strikers will include support beneath the stainless-steel lift bar to prevent door curtain bounce, improve bottom seal life expectancy and to avoid false door ajar signals.

All injection molded roll-up door wear components will be constructed of Type 6 nylon.

Each roll-up door shall have a 3.00-inch diameter balancer/tensioner drum to assist in lifting the door. A garage door style shall not acceptable.

The header for the roll-up door assembly shall not exceed 4.00".

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

SCUFF PLATE

A polished stainless-steel scuff plate shall be furnished around the opening for the DEF fill door to prevent chipping and stain.

SCUFF PLATE

A polished stainless-steel scuff plate shall be furnished around the opening for the fuel fill door to prevent chipping and fuel stain.

SCUFF PLATE

A quantity of two (2) polished stainless steel shall be furnished transverse DS & PS cab compartment lips at the bottom of the sill. The scuff plates shall be 1" coverage on door sill lip.

Bidder Complies	
Yes	No

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

ROLL-UP DOOR TRIM
The exterior of the aluminum trim around the door opening shall be painted to match the color of the applicable door.
There shall be 11 compartments with the trim painted.

COMPARTMENT LIGHTING
There shall be 14 compartments that include white 12-volt DC LED compartment light strips with 45-degree brackets. The light manufacturers electrical connectors shall be included in the circuit. The lights shall be mounted with mechanical fasteners.

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

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

MOUNTING TRACKS
There shall be 12 sets of tracks for mounting shelf(s) in LS1, LS2, LS3, LS4, LS5, LS6, RS1, RS2, RS3, RS4, RS5 and RS6. These tracks shall be installed vertically to support the adjustable shelf(s) and shall be full height of the compartment. The tracks shall be unpainted with a natural finish.

ADJUSTABLE SHELVES
There shall be six (6) shelves with a capacity of 500 lb. provided. The shelf construction shall consist of .188" D/A sanded aluminum 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 shall be to be determined by committee.

SLIDE-OUT ADJUSTABLE HEIGHT TRAY
There shall be four (4) slide-out trays provided.

Each tray shall have 2.00" high sides and shall be half (1/2) the depth of the transverse compartment. The capacity rating of the tray shall be 500 lb. in the extended position.

	Bidder Complies	
	Yes	No

Each tray shall be mounted on a pair of side mounted slides. The slide mechanisms shall have ball bearings for ease of operation and years of dependable service. The slides shall be mounted to shelf tracks to allow the tray to be adjustable up and down within the designated mounting location.

An automatic lock shall be provided for both the in and out tray positions. The lock trip mechanism shall be located at the front of the tray and shall be easily operated with a gloved hand.

The tray(s) shall be located RS5, RS6, LS5, LS6.

SLIDE-OUT/TILT-DOWN TRAY

There shall be one (1) slide-out tray provided.

The bottom of each tray shall be constructed of 0.188" thick aluminum while special aluminum extrusions shall be utilized for the tray sides, ends, and tracks. The corners shall be welded to form a rigid unit.

A spring-loaded lock shall be provided on each side at the front of the tray. Releasing the locks shall allow the tray to slide out approximately two-thirds (2/3) of its length from the stowed position and tip 30 degrees down from horizontal. The tray shall be equipped with ball bearing rollers for smooth operation.

Rubber padded stops shall be provided for the tray in the extended position.

The capacity rating of the tray shall be a minimum of 215 lb. in the extended position.

The vertical position of the tray within the compartment shall be adjustable.

The tray(s) shall be located RS5 upper.

SLIDE-OUT FLOOR MOUNTED TRAY

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

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

Each tray shall be constructed of aluminum with a dual action finish

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

To ensure years of dependable service, the slides shall be coated with a finish that is tested to withstand a minimum of 1,000 hours of salt spray per ASTM B117.

	Bidder Complies	
	Yes	No

To ensure years of easy operation, the slides shall require no more than a 50lb force for push-in or pull-out movement when fully loaded after having been subjected to a 40-hour vibration (shaker) test under full load. The vibration drive file shall have been generated from accelerometer data collected from a heavy truck chassis driven over rough gravel roads in an unloaded condition. Proof of compliance shall be provided upon request.

Automatic locks shall be provided for both the "in" and "out" positions. The trip mechanism for the locks shall be located at the front of the tray for ease of use with a gloved hand.

The location(s) shall be RS1, RS4, LS1 and LS4.

STORAGE BOX

A box shall be furnished for storage of a stokes basket 96" L x 44" W x 12" H.

The size of the compartment shall be approximately 44.00" wide x 96.00" long x 12" high with a clear door opening of approximately 10.00" high x 40.00" wide and shall have access on each side.

Two (2) lift-up doors one (1) each side. Each door shall be horizontally hinged with two (2) gas shocks to hold the doors open and have two (2) D-ring latches on each door to secure the door in the closed position. Each door shall be provided with cylinders that allow the doors to lift past 90 degrees.

The floor of the compartment shall be lined lengthwise with three (3) strips of 5" wide Dura-Surf.

Construction shall consist of aluminum treadplate. The cover shall be reinforced with 3/16" treadplate to minimize flex and support the weight of a firefighter.

The box shall be mounted over the across the body, under the aerial device, above P3/D3 compartments.

This option shall increase the height of the boom support.

MOUNTING, STOKES BASKET/TARPS

There shall be two (2) storage box(es) provided for a stokes basket and tarps above the PS & DS compartment catwalks side compartments. The storage box shall be approximately 26.00" wide x 120.00" long x 12.00" high and shall be constructed of smooth aluminum, painted job color. The forward 90.00" portion of the box shall be used for stokes storage. The rear portion shall be used for tarp storage. Each portion of the box shall include a lift-up aluminum treadplate cover with pneumatic lift cylinders. There shall be vents and drains provided in the box to prevent condensation.

PARTITION IN TRANSVERSE COMPARTMENT

One (1) partition shall be bolted in compartment full depth. The partition shall be 28" from the front wall so the 24" wide CTECH chest of drawers can fit forward of the partition. Each partition shall be the full vertical height of the compartment.

	Bidder Complies	
	Yes	No

SCBA HOLDER

A total of five (5) SCBA holder bracket. This bracket shall include a backplate, two seats, a footplate and the model LLS ("Load & Lock") strap to hold the bottle in the bracket. The bracket shall be a "one size fits all" style seat and shall accommodate SCBA cylinders from the high pressure 30-minute to the high pressure 60-minute.

The brackets shall be mounted to be determined.

MATTING, COMPARTMENT SHELVING

Turtle Tile compartment matting shall be provided in 15 shelves. The locations are, on all shelves and trays.
The color of the Turtle Tile shall be black.

MATTING, COMPARTMENT FLOOR

Turtle Tile compartment matting shall be provided in six (6) compartments on the compartment floor. The locations are, on all compartment floors without floor mounted trays.

The Turtle Tile shall be black, and the leading edge of the matting shall include the beveled edge. The beveled edge shall be yellow.

MOUNTING TRACKS

There shall be two (2) sets of tracks for mounting equipment. These tracks shall be installed horizontally on the back wall of the compartment(s).

The compartment(s) with mounting tracks shall be to be determined (for SCBA brackets).

VENTILATION SYSTEM

A compartment ventilation system shall be incorporated in up to ten (10) compartments. The system shall consist of a 400-cfm twin fan motor located in the pump house area. PVC tubing shall be used to force the air into each compartment.

A timer shall allow the system to operate two (2) hours on and four (4) hours off.

RUB RAIL

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

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

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

BODY FENDER CROWNS

Stainless steel fender crowns shall be provided around the rear wheel openings.

A rubber welting shall be provided between the body and the crown to seal the seam and restrict moisture from entering.

	Bidder Complies	
	Yes	No

A dielectric barrier shall be provided between the fender crown fasteners (screws) and the fender sheet metal to prevent corrosion.

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.

AIR BOTTLE STORAGE BIN

A storage bin shall be provided for storage of up to six (6) air bottles. This storage bin shall be installed at a location TBD. Each separate air bottle storage compartment shall be 7.50" square x 23.00" deep. The storage bin shall be formed out of aluminum and the flooring lined with Dura-surf.

AIR BOTTLE STORAGE AT REAR BELOW LADDER COMPARTMENT

Storage for three (3) air bottles to be between the frame rails below the ladder storage compartment. The storage bin shall be formed out of aluminum and the flooring lined with Dura-surf.

EXTENSION LADDER

There shall be two (2) 35' two (2) section aluminum extension ladder(s) provided.

There shall be one (1) 28’ two (2) section aluminum extension ladder provided.

THERE SHALL BE ONE (1) 24’ TWO (2) SECTION ALUMINUM EXTENSION LADDER

PROVIDED.ROOF LADDERS

There shall be two (2) 16' aluminum roof ladders provided.

There shall be one (1) 12' roof, aluminum ladder provided.

There shall be one (1) 20' roof, aluminum ladder provided.

There shall be one (1) 18' roof, aluminum ladder provided.

ATTIC EXTENSION LADDER

There shall be one (1) 9'-2”-14’ Duo Safety 701 Fresno aluminum attic extension ladder(s) provided.

Bidder Complies	
Yes	No

FOLDING ATTIC LADDER
There shall be one (1) 10' aluminum folding attic ladder(s).

All ladders shall be Duo Safety.

GROUND LADDER STORAGE
The ground ladders shall be removable from the center rear of the apparatus.

The ladders shall be individually stored in stainless steel slides and shall be arranged in such a manner that any one (1) ladder can be removed without having to move or remove any other ladder. Black Dura-Surf friction reducing material shall be added to the stainless-steel slides, on the bottom horizontal surfaces, of the ladder storage rack.

Vertically hinged double lap doors shall be provided at the rear to close the ladder compartment.

Doors shall be of double pan aluminum construction. Single sheet aluminum doors shall not be considered. (no exception).

The lock door shall be latched with Eberhard latches with "D" ring handles. There shall be a grabber door stay bracket provided on the outside of each door to hold it in the open position.

LADDER STORAGE LIGHTING
There shall be two (2) LED lights to illuminate the torque box ladder storage compartment. One (1) each side shall be located on the side wall of the torque box near the ladder storage entry area.

The lights shall be activated when the ladder storage compartment door is opened.

LADDER SLIDES
Friction reducing material shall be added to the stainless-steel slides, on the bottom horizontal surfaces, of the ladder storage rack.

NESTED LADDER STORAGE
There shall be nested ladders on the right side of the ladder storage compartment.

NESTED LADDER STORAGE
There shall be nested ladders on the left side of the ladder storage compartment. The ladders shall be nested so that one ladder can be removed without removing the adjoining ladder.

NEW YORK HOOKS
The New York Hook(s) shall be stored in tubular holders located in the ground ladder storage compartment.

There shall be four (4) 6’ Fire Hooks Unlimited New York Hooks.

There shall be one (1) 10’ Fire Hooks Unlimited New York Hook.

	Bidder Complies	
	Yes	No

There shall be holders located in the torque box/ladder storage area for a total of six (6) hooks.

If the head of the hooks can come into contact with a painted surface, a stainless-steel scuff plate shall be provided.

RUBBISH/TRASH HOOKS

The rubbish(s) shall be stored in holders located in the ground ladder storage compartment.

There shall be three (3) 6’ rubbish/trash hooks with D handles.

There shall be holders located in the torque box/ladder storage area for a total of three (3) Rubbish/Trash hooks.

If the head of the hooks can come into contact with a painted surface, a stainless-steel scuff plate shall be provided.

PUMP

Pump shall be a 1750-gpm single (1) stage midship mounted centrifugal type. The pump shall be end suction, single inlet type.
Pump shall be the class "A" type.

Pump shall deliver the percentage of rated discharge at pressure 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 vertically split.

Impeller shaft shall be stainless steel, accurately ground to size. It shall be supported by oil or grease lubricated, 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, slinger rings, and oil seals. No special or sleeve type bearings shall be used.

PUMP TRANSMISSION

Pump transmission shall be made of a three (3) piece, high tensile aluminum, horizontally split casing. Power transfer to pump shall be through a passive lubricated, Morse HY-VO drive chain.

Drive shafts shall be a minimum of 2.35" diameter hardened and ground alloy steel. All shafts shall be ball bearing supported. The case shall be designed as to eliminate the need for water cooling.

	Bidder Complies	
	Yes	No

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".

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

The relief valve shall have a working range of 50 psig to 250 psig.

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 an access door at the right-side pump panel.

Bidder Complies	
Yes	No

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.

One (1) priming control shall open the priming valve and start the pump primer.

RECIRCULATING LINE WITH CHECK VALVE

A 0.50" diameter recirculating line, from the pump to the water tank, shall be furnished with a control installed at the pump operator's control panel. A check valve shall be provided in this line to prevent the back flow of water from the tank to the pump if the valve is left in the open position.

PUMP MANUALS

There shall be a total of two (2) pump manuals provided by the pump manufacturer and furnished with the apparatus. The manuals shall be provided by the pump manufacturer in the form of two (2) 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 hoses 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.

	Bidder Complies	
	Yes	No

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).

INLET VALVES WITH INTAKE RELIEF VALVE

There shall be One (1) manually operated aluminum ball intake valve(s) provided at left side main inlet.

The inlet connection shall be 3ST (5.0" Swivel Storz) with a cap and the outlet connection shall be NX (6.0" Threaded Swivel). There shall be an eight-position adjustable 30 degree swiveling detent elbow on the inlet side of the ball intake valve.

The ball intake valve shall be controlled with a NFPA compliant slow-close hand wheel. The hand wheel shall have a Standard shaft. A position indicator shall be provided to allow for a quick visualization of the status of the valve in the open, closed or transition position.

The ball intake valve shall be equipped with an adjustable pressure relief valve. The relief valve shall have a working range of 90 PSI to 300 PSI

A 3/4" bleeder/drain valve shall be provided on the ball intake valve to exhaust excess air or water from the valve.

For corrosion protection the aluminum casting shall have a hard coat anodized finish, with a powder coated internal and external finish. All the components facing the wet side of the valve shall be constructed from stainless steel.

INLET VALVES WITH INTAKE RELIEF VALVE

There shall be One (1) electric remote-controlled aluminum ball intake valve(s) provided at right side main pump inlet.

The inlet connection shall be 3ST (5.0" Swivel Storz) with a cap and the outlet connection shall be NX (6.0" Threaded Swivel). There shall be an eight-position adjustable 30 degree swiveling detent elbow on the inlet side of the ball intake valve.

The valve shall be controlled by a remote panel-mounted push-button switch with LED lights for a quick visualization of the status of the valve in the open, closed or transition position. The push button switch shall be mounted on the pump operator's panel.

The ball intake valve shall be equipped with an adjustable pressure relief valve. The relief valve shall have a working range of 90 PSI to 300 PSI

A 3/4" TFT bleeder/drain valve shall be provided on the ball intake valve to exhaust excess air or water from the valve.

For corrosion protection the aluminum casting shall have a hard coat anodized finish, with a powder coated internal and external finish. All the components facing the wet side of the valve shall be constructed from stainless steel.

VALVES
All discharges shall use in-line ball valves.

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.

Inlet valve location shall be outside of the pump panel.

RIGHT 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.

Inlet valve location shall be outside of the pump panel.

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

TANK TO PUMP
The booster tank shall be connected to the intake side of the pump with heavy duty 4.00" piping and a quarter turn 3.00" full flow line valve with the control remotely located at the operator's panel. 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.

	Bidder Complies	
	Yes	No

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

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

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.

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).

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).

	Bidder Complies	
	Yes	No

RIGHT SIDE OUTLET ELBOWS

The 2.50" discharge outlets located on the right-side pump panel shall be furnished with a 2.50" (F) National Standard hose thread x 2.50" (M) National Standard hose thread, chrome plated, 45-degree elbow.

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

LARGE DIAMETER OUTLET ELBOWS

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

DISCHARGE OUTLET CONTROLS

The discharge outlets shall incorporate a quarter-turn ball valve with the control located at the pump operator's panel. The valve operating mechanism shall indicate the position of the valve.

If a handwheel control valve is used, the control shall be a minimum of a 3.9" diameter stainless steel handwheel with a dial position indicator built in to the center of the handwheel.

CROSSLAY HOSE BED

Two (2) crosslay with 1.50" outlet shall be provided. The bed to be capable of carrying 200 feet of 1.75" double jacketed hose and shall be plumbed with 2.00" i.d. pipe and gated with a 2.00" quarter turn ball valve.

Outlet to be equipped with a 1.50" National Standard hose thread 90-degree swivel located in the hose bed so that hose may be removed from either side of apparatus.

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

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

Vertical scuff plates, constructed of stainless steel, shall be provided at the front and rear ends of the bed on each side of vehicle.

Crosslay bed flooring shall consist of removable perforated brushed aluminum.

CROSSLAY HOSE BEDS

One (1) crosslay with 2.50" outlets shall be provided. Each bed to be capable of carrying 200 feet of 2.50" double jacket 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 DA finish. The remainder of the crosslay bed shall be painted job color.

Stainless steel vertical scuff plates 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 scuff plate.

Crosslay bed flooring shall consist of removable perforated brushed aluminum.

ROLL-UP DOORS TO COVER PUMP PANEL AND CROSSLAY/DEADLOAD COMPARTMENTS

All compartment doors shall be roll-up style double faced, aluminum construction, painted one (1) color to match the lower portion of the body.

The track shall be the flanged track with the screws installed to the rear of the track guide.

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

Between each slat shall be a PVC inner seal to prevent metal to metal contact and prevent dirt or moisture from entering the compartments.
Each door shall have a 4.00" counter balance to assist in lifting.

A stainless-steel lift bar to be provided for opening the door and located at the bottom of each door with latches on the outer extrusion of the door frame. A ledge to be supplied over lift bar for additional area to aid in closing the door. The lift bar shall be located at the bottom of door with striker latches installed at the base of the side frames. Side frame mounted door strikers shall include support beneath the stainless-steel lift bar to prevent door curtain bounce, improve bottom seal life expectancy and to avoid false door ajar signals.
A heavy-duty magnetic switch shall be used for the control of "open compartment door" warning lights.

The crosslays shall have a drip pan below the roll of the door.

One (1) deadlay bed without plumbing, shall be provided above the pump compartment capable

of carrying 300' x 1.75" single stack.

Stainless steel vertical scuff plates shall be provided at hose bed ends (each side of vehicle). The bottom of hose bed ends (each side) shall also be equipped with a stainless-steel scuff plate.

aft of second crosslay

Deadlay bed flooring shall consist of removable perforated brushed aluminum.

Bidder Complies	
Yes	No

FOAM SYSTEM

A foam system shall not be required on this apparatus.

PUMP COMPARTMENT

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

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

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

The pump compartment on both sides of the tractor shall be covered with a roll up door.

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.

PUMP CONTROL PANELS (SIDE CONTROL)

All pump controls and gauges shall be located at the left (driver's) side of the apparatus and properly marked.

The pump panel on the right (passenger's) side shall be removable with lift and turn type fasteners. The left (driver's) side shall be fastened with screws.

The control panels shall be 40.00" wide.

The gauge and control panels shall be two (2) separate panels for ease of maintenance.

The side gauge panel 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.

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

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

The identification tag for each valve control shall be recessed in the face of the tee handle.

	Bidder Complies	
	Yes	No

All discharge outlets shall have color coded identification tags, with each discharge having its own unique color. Color coding shall include the labeling of the outlet and the drain for each corresponding discharge.

All line pressure gauges shall be mounted in individual chrome plated castings with the identification tag recessed in the casting below the gauge. All remaining identification tags shall be mounted on the pump panel in chrome plated bezels. Mounting of the castings and identification bezels shall be done with a threaded peg cast on the back side of the bezel or screws.

PUMP PANEL CONFIGURATION

The pump panel configuration shall be neat and orderly.

PUMP OPERATOR'S PLATFORM

A pull out, flip down platform shall be provided at the pump operator's control panel.

The front edge and the top surface of the platform shall be made of DA finished aluminum with a Morton Cass insert.

The platform shall be approximately 13.75" deep when in the stowed position and approximately 22.00" deep when extended. The platform shall be 35.00" wide. The platform shall lock in the retracted and the extended position.

The platform shall be wired to the "step not stowed" indicator in the cab.

PUMP OPERATOR'S PLATFORM PERIMETER LIGHT

There shall be an 20.00" white 12-volt DC LED strip light provided to illuminate the ground area.

PUMP AND GAUGE PANEL

The pump and gauge panels shall be constructed of aluminum with a painted FormCoat black finish. A polished aluminum trim molding shall be provided around each panel.

The right-side pump panel shall be removable and fastened with swell type fasteners.

On the front of the pump house structure, provisions shall be provided for access to the pump.

PUMP COMPARTMENT LIGHT

There shall be one (1) 3.00" white 12-volt DC LED light(s) with flange(s) installed in the pump compartment.

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

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

Also provided at the pump panel shall be the following:

- Master Pump Drain Control

EXHIBIT B (Tractor Drawn Aerial)

Bidder Complies	
Yes	No

AIR HORN BUTTON

An air horn control button shall be provided at the pump operator's control panel. This button shall be red in color and properly labeled and put within easy reach of the operator.

PUMP ACCESS DOOR

A vertically hinged stainless-steel door shall be provided on the driver's side pump panel for access to pump and components. The door shall be sized as large as possible.

DRAINS, DRIVERS SIDE

The drains on the driver's side pump panel shall be located to keep area clear to put 25' of 5" hose.

PASSENGERS SIDE DRAINS

The drains on the passenger's side pump panel shall be located to keep area clear to put 25' of 5" hose

RADIO SPEAKER W/SWITCH

A black amplified, weatherproof speaker with volume control and off position shall be mounted to a bracket behind an opening in the pump panel. The cables shall terminate at pump panel high where convenient.

COLOR CODED TRIM RINGS

All outlet discharges shall have color coded trim rings with each discharge having its own color.

LIGHT PUMP ENGAGED

The green indicator light at the left side pump panel provided in the pump shift option shall be LED in place of the standard green light.

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.

	Bidder Complies	
	Yes	No

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.

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.

Bidder Complies	
Yes	No

LIGHT SHIELD

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

- There shall be 12-volt DC white LED lights installed under the stainless-steel light shield to illuminate the controls, switches, essential instructions, gauges, and instruments necessary for the operation of the apparatus. These lights shall be activated by the pump panel light switch. Additional lights shall be included every 18.00" depending on the size of the pump house.
- One (1) pump panel light shall come on when the pump is in ok to pump mode.

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

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

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

ELECTRONIC SIREN

An electronic siren and remote head with a pre wired unidirectional microphone shall be installed.

The model to be used shall be determined by the chassis and location of the siren remote head.

The siren shall contain a remote siren head and a siren amplifier with a dual system build in to the amplifier.

The siren features shall include:

- Six (6) function siren plus radio repeat and public address
- Will meet California Title 13 and SAE J1849 specifications.
- The siren shall operate two (2) 100-watt speakers
- Operates is dual or mono modes.
- External dip switch selectable modes of operation.

Bidder Complies	
Yes	No

- Outputs 2 independent siren tones creating a "rich harmonic dual tone sound".
- "Hands Free" operation. Turn On/Off and access all three siren tones (wail, yelp, and Piercer) without taking hands from the steering wheel.
- PTT (push to talk) switch on microphone overrides all siren functions.
- Pre-Wired unidirectional microphone.
- Adjustable microphone volume.
- Adjustable preset radio repeat volume.
- Input polarity protection.
- Output short circuit protection.
- External mini spade-type fuse.
- Bi-polarity horn/ring control activation.
- Quick disconnect plug for ease of service or replacement.
- Five-year HDP "Heavy Duty Professional" warranty on amp.

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

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

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

SPEAKER

There shall be one (1) 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 Federal “Q” 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.

MECHANICAL SIREN CONTROL

The mechanical siren shall be actuated by a chrome push button located on the officer side of the engine tunnel, and one (1) foot switch located on the driver's side.

INTERLOCK, ELECTRONIC SIREN

The electronic siren shall be interlocked to shut off when the parking brake is set.

A second siren brake switch shall be installed on the passenger side.

Bidder Complies	
Yes	No

FRONT ZONE UPPER WARNING LIGHTS

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

The lightbar shall include the following:

- One (1) red flashing LED module in the left side rear corner position.
- One (1) red flashing LED module in the left side end position.
- One (1) red flashing LED module in the left side front corner position.
- One (1) red flashing LED module in the left side first front position.
- One (1) white flashing LED module in the left side second front position.
- One (1) red flashing LED module in the left side third front position.
- One (1) red flashing LED module in the left side fourth front position.
- One (1) red flashing LED module in the left side fifth front position.
- One (1) LED traffic light controller set to national standard high priority in the center positions.
- One (1) red flashing LED module in the right side fifth front position.
- One (1) red flashing LED module in the right side fourth front position.
- One (1) red flashing LED module in the right side third front position.
- One (1) white flashing LED module in the right side second front position.
- One (1) red flashing LED module in the right side first front position.
- One (1) red flashing LED module in the right-side front corner position.
- One (1) red flashing LED module in the right-side end position.
- One (1) red flashing LED module in the right-side rear corner position.

There shall be clear lenses included on the lightbar.

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

- a switch to control the flashing LED modules.
- the traffic light controller shall be activated by a cab switch with emergency master control,
- and there shall be a passenger's side momentary cab switch with no emergency master control to activate the traffic light controller.

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

The eight (8) red flashing LED modules in the front positions, and the two red (2) flashing LED modules in the end positions may be load managed when the parking brake is applied.

Bidder Complies	
Yes	No

CAB FACE WARNING LIGHTS

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

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

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

There shall be a switch located in the cab, on the switch panel, to control the four (4) lights.

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

SIDE ZONE LOWER LIGHTING

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

- Two (2) lights, one (1) each side on the bumper extension. The side front lights to be red.
- Two (2) lights, one (1) each side above rear wheels. The side rear lights to be red.
- The lights shall include a clear lenses.

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.

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.

Bidder Complies	
Yes	No

TRAFFIC DIRECTING LIGHT

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

The control head shall be included with this installation.

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

The auxiliary flash not activated.

This traffic directing light shall be surface mounted with a treadplate box at the rear of the apparatus as high as practical.

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

ELECTRICAL SYSTEM GENERAL DESIGN FOR ALTERNATING CURRENT

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

General

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

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

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

Grounding

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

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

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

In addition to the bonding required for the low voltage return current, each body and driving or crew compartment enclosure shall be bonded to the vehicle frame by a copper conductor. This

conductor shall have a minimum amperage rating of 115 percent of the nameplate current rating of the power source specification label as defined in Section 310-15 (amp capacities) of the NEC. A single conductor properly sized to meet the low voltage and line voltage requirements shall be permitted to be used.

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

Operation

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

Provisions shall be made for quickly and easily placing the power source into operation. The control shall be marked to indicate when it is correctly positioned for power source operation. Any control device used in the drive train shall be equipped with a means to prevent the unintentional movement of the control device from its set position.

A power source specification label shall be permanently attached to the apparatus near the operator's control station. The label shall provide the operator with the following information:

- Rated voltage(s) and type (ac or dc)
- Phase
- Rated frequency
- Rated amperage
- Continuous rated watts
- Power source engine speed

Direct drive (PTO) and portable generator installations shall comply with Article 445 (Generators) of the NEC.

Overcurrent protection

The conductors used in the power supply assembly between the output terminals of the power source and the main over current protection device shall not exceed 144.00" (3658 mm) in length.

For fixed power supplies, all conductors in the power supply assembly shall be type THHW, THW, or use stranded conductors enclosed in nonmetallic liquid tight flexible conduit rated for a minimum of 194-degree Fahrenheit (90 degrees Celsius).

For portable power supplies, conductors located between the power source and the line side of the main overcurrent protection device shall be type SO or type SEO with suffix WA flexible cord rated for 600-volts at 194 degrees Fahrenheit (90 degrees Celsius).

Wiring Methods
Fixed wiring systems shall be limited to the following:

- Metallic or nonmetallic liquid tight flexible conduit rated at not less than 194 degrees Fahrenheit (90 degrees Celsius)
- or
- Type SO or Type SEO cord with a WA suffix, rated at 600 volts at not less than 194 degrees Fahrenheit (90 degrees Celsius)

Electrical cord or conduit shall not be attached to chassis suspension components, water or fuel lines, air or air brake lines, fire pump piping, hydraulic lines, exhaust system components, or low voltage wiring. In addition, the wiring shall be run as follows.

- Separated by a minimum of 12.00" (305 mm), or properly shielded, from exhaust piping
- Separated from fuel lines by a minimum of 6.00" (152 mm) distance

Electrical cord or conduit shall be supported within 6.00" (152 mm) of any junction box and at a minimum of every 24.00" (610 mm) of continuous run. Supports shall be made of nonmetallic materials or corrosion protected metal. All supports shall be of a design that does not cut or abrade the conduit or cable and shall be mechanically fastened to the vehicle.

Wiring Identification
All line voltage conductors located in the main panel board shall be individually and permanently identified. The identification shall reference the wiring schematic or indicate the final termination point. When prewiring for future power sources or devices, the unterminated ends shall be labeled showing function and wire size.

Wet Locations
All wet location receptacle outlets and inlet devices, including those on hardwired remote power distribution boxes, shall be of the grounding type provided with a wet location cover and installed in accordance with Section 210-7 "Receptacles and Cord Connections" of the NEC.

All receptacles located in a wet location shall be not less than 24.00" (610 mm) from the ground. Receptacles on off-road vehicles shall be a minimum of 30.00" (762 mm) from the ground.

The face of any wet location receptacle shall be installed in a plane from vertical to not more than 45 degrees off vertical. No receptacle shall be installed in a face up position.

Dry Locations
All receptacles located in a dry location shall be of the grounding type. Receptacles shall be not less than 30.00" (762 mm) above the interior floor height.

All receptacles shall be marked with the type of line voltage (120-volts or 240-volts) and the current rating in amps. If the receptacles are direct current, or other than single phase, they shall be so marked.

Bidder Complies	
Yes	No

Listing
All receptacles and electrical inlet devices shall be listed to UL 498, Standard for Safety Attachment Plugs and Receptacles, or other appropriate performance standards. Receptacles used for direct current voltages shall be rated for the appropriate service.

Electrical System Testing
The wiring and associated equipment shall be tested by the apparatus manufacturer or the installer of the line voltage system.

The wiring and permanently connected devices and equipment shall be subjected to a dielectric voltage withstand test of 900-volts for one (1) minute. The test shall be conducted between live parts and the neutral conductor, and between live parts and the vehicle frame with any switches in the circuit(s) closed. This test shall be conducted after all body work has been completed.

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

Operational Test per Current NFPA 1901 Standard
The apparatus manufacturer shall perform the following operation test and ensure that the power source and any devices that are attached to the line voltage electrical system are properly connected and in working order. The test shall be witnessed, and the results certified by an independent third-party certification organization.

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

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

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

GENERATOR
The apparatus shall be equipped with a complete electrical power system. The generator shall be a 10.0 kW Hydraulic unit. The wiring and generator installation shall conform to the present National Electrical Codes Standards of the National Fire Protection Association. The installation shall be designed for continuous operation without overheating and undue stress on components.

	Bidder Complies	
	Yes	No

Generator Performance

- Continuous Duty Rating: 10,000 watts

- Nominal Volts: 120/240

- Amperage: 83.3 @ 120 volts, 41.7 @ 240 volts

- Phase: Single

- Cycles: 60 hertz

- Engine Speed at Engagement: Idle

- RPM range: 1100 to 3,000

Generator Dimensions

- Length: 35 inches

- Width: 23 inches

- Height: 19.00 inches

- Weight: 475 pounds

The output of the generator shall be controlled by an internal hydraulic system. An electrical instrument gauge panel shall be provided for the operator to monitor and control all electrical operations and output.

The generator shall be driven by a transmission power take off unit, through a hydraulic pump and motor.

The generator shall include an electrical control inside the cab. The hydraulic engagement supply shall be operational only after the chassis parking brake is applied.

An electric/hydraulic valve shall supply hydraulic fluid to the clutch engagement unit provided on the chassis PTO drive.

Generator Instruments and Controls

To properly monitor the generator performance a meter panel shall be furnished and mounted next to the circuit breaker panel. The unit shall be a single phase, three (3)-wire, 120/240-volt series. The following instruments shall be installed in the panel if not specified on the generator:

- One (1) Voltmeter

- Two (2) Ammeters

	Bidder Complies	
	Yes	No

- One (1) Frequency Meter

- One (1) Hour Meter on the Generator

- One (1) "PTO" Engagement Green Indicator Light

- One (1) "Power On" Green Indicator Light

- Two (2) Fuse Holders with Two (2) Amp Fuses (for gauge protection)

The gauges and controls shall be installed near eye level in the compartment. Instruments shall be flush mounted in an appropriately sized weatherproof electrical enclosure. All instruments used shall be accurate within +/- two (2) percent. The load center shall have a circuit breaker to assure overload protection. The breaker furnished shall be properly sized to the generator output.

Generator Wiring:

The system shall be installed by highly qualified electrical technicians to assure the required level of safety and protection to the fire apparatus operators. The wiring, electrical fixtures and components shall be to the highest industry quality standards available on the domestic market. The equipment shall be the type as designed for mobile type installations subject to vibration, moisture and severe continuous usage. The following electrical components shall be the minimum acceptable quality standards for this apparatus:

Wiring:

All electrical wiring shall be fine stranded copper type. The wire shall be sized to the load and circuit breaker rating; ten (10) gauge on 30-amp circuits, 12 gauge on 20-amp circuits and 14 gauge on 15-amp circuits. The cable shall be run in corner areas and extruded aluminum pathways built into the body for easy access.

Load Center:

The main load center shall be provided with circuit breakers rated to load demand.

Circuit Breakers:

Individual breakers shall be provided for all on-line equipment to isolate a tripped breaker from affecting any other on-line equipment.

GENERATOR LOCATION

The generator shall be mounted in the area above the goose neck of the tiller trailer. The flooring in this area shall be either reinforced or constructed, in such a manner, that it shall handle the additional weight of the generator.

Bidder Complies	
Yes	No

GENERATOR START
A switch shall be located on the cab instrument panel and at the pump panel area to engage the generator. The single switch in both locations shall engage the generator PTO and the electric field simultaneously.

CIRCUIT BREAKER PANEL
The circuit breaker panel shall be located high on the right wall of compartment RS5.

GENERATOR INTERLOCK
Special programming shall be provided to not allow the generator PTO to engage if the engine is above 900 RPM.

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

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

A captive roller assembly to be provided to aid in the payout and loading of the reel. A ball stop shall be provided to prevent the cord from being wound on the reel.

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

A total of one (1) cord reel shall be provided one (1) forward on the driver's side catwalk.

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

CORD
Provided for electric distribution shall be one (1) length installed on the reel of 200 feet of yellow 10/3 electrical cord, weather resistant 105 degree Celsius to -50 degree Celsius, 600-volt jacketed SOOW cord. A Hubbell L5-20, 20-amp, 120-volt, twist lock connector body shall be installed on the end of the cord.

REEL ENCLOSURE
An aluminum treadplate enclosure shall be installed over the reel. The enclosure shall be provided with a stainless-steel hinge that shall allow the cover to be opened for maintenance purposes.

A nylatron guide shall be mounted in the outboard side of the enclosure. A ball stop shall be provided on the cord to stop the cord at the nylatron slide assembly.

A total of one (1) shall be installed LS (DS) trailer tongue.

Bidder Complies	
Yes	No

120 VOLT RECEPTACLE

There shall be two (2), 15/20-amp 120-volt AC three (3) wire straight blade duplex receptacle(s) with interior stainless-steel wall plate(s), installed one in each EMS cabinet, high on back wall. The NEMA configuration for the receptacle(s) shall be 5-20R.

The receptacle(s) shall be powered from the onboard generator to shoreline power transfer switch.

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

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

120 VOLT RECEPTACLE

There shall be one (1), 4-place receptacle box(es) with four (4) 15/20-amp 120-volt AC three (3) wire straight blade receptacles with an interior stainless-steel wall plate installed D4 upper rear wall (E-Draulic tools). The NEMA configuration for the receptacles shall be 5-20R.

The receptacle(s) shall be powered from the onboard generator to shoreline power transfer switch.

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

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

FOUR (4)-SECTION 107 FOOT TRACTOR-DRAWN AERIAL LADDER

CONSTRUCTION STANDARDS

The ladder shall be constructed to meet all of the requirements as described in the current NFPA 1901 standards.

The aerial device shall be a true ladder type device; therefore, ladders attached to booms shall not be considered.

These capabilities shall be established in an unsupported configuration.

All structural load supporting elements of the aerial device that are made of a ductile material shall have a design stress of not more than 50% of the minimum yield strength of the material

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	Bidder Complies	
	Yes	No

based on the combination of the live load and the dead load. This 2:1 structural safety factor meets the current NFPA 1901 standard.

All structural load supporting elements of the aerial device that are made of non-ductile material shall have a design stress of not more than 20% of the minimum ultimate strength of the material, based on the combination of the rated capacity and the dead load. This 5:1 safety factor meets the current NFPA 1901 standard.

Wire ropes and attaching systems used to extend and retract the fly sections shall have a 5:1 safety factor based on the ultimate strength under all operating conditions. The factor of safety for the wire rope shall remain above 2:1 during any extension or retraction stall. The minimum ratio of the diameter of wire rope used to the diameter of the sheave used shall be 1:12. Wire ropes shall be constructed of seven (7) strands over an inner wire core for increased flexibility. The wire rope shall be galvanized to reduce corrosion.

The aerial base pivot bearings shall be maintenance free type bearings and require no external lubrication.

The aerial device shall be capable of sustaining a static load one and one-half times its rated tip load capacity (live load) in every position in which the aerial device can be placed when the vehicle is on a firm level surface.

The aerial device shall be capable of sustaining a static load one and one-third times its rated tip load capacity (live load) in every position the aerial device can be placed when the vehicle is on a slope of five degrees downward in the direction most likely to cause overturning.

With the aerial device out of the cradle and in the fully extended position at zero degrees elevation, a test load shall be applied in a horizontal direction normal to the centerline of the ladder. The turntable shall not rotate, and the ladder shall not deflect beyond what the product specification allows.

All welding of aerial components, including the aerial ladder sections, turntable, pedestal, and outriggers, shall be in compliance with the American Welding Society standards. All welding personnel shall be certified, as qualified under AWS welding codes.

The aerial device shall be capable of operating in conditions of wind up to 50 mph and icing conditions of up to a .25" coating over the aerial structure.

All the design criteria must be supported by the following test data (no exception):

- Strain gage testing of the complete aerial device

- Analysis of deflection data taken while the aerial device was under test load

The following standards for materials are to be used in the design of the aerial device:

- Materials are to be certified by the mill that manufactured the material

	Bidder Complies	
	Yes	No

- Materials that are certified or recertified by vendors other than the mill shall not be acceptable

- Material testing that is performed after the mill test shall be for verification only and not with the intent of changing the classification

- All welded structural components for the ladder shall be traceable to their mill lots.

LADDER CONSTRUCTION

The ladder is comprised of four (4) sections.

The ladder shall have the capability to support a minimum of 750 pounds at the tip in the unsupported configuration, based upon 360-degree rotation, up to full extension and from -10 degrees to +77 degrees.

The ladder (handrails, baserails, trusses, K-braces and rungs) shall be constructed of high strength low alloy steel, minimum 100,000 pounds per square inch yield, with full traceability on all structural members (no exception).

Each section shall be trussed diagonally, vertically and horizontally using welded steel tubing.

All ladder rungs are round and welded to each section utilizing "K" bracing for lateral and torsional rigidity.

The inside width dimensions of the ladder shall be:

- Base Section41.87"

- Lower Mid Section34.88"

- Upper Mid Section27.87"

- Fly Section21.63"

The height of the handrails above the centerline of the rungs shall be:

- Base Section26.28"

- Lower Mid Section22.68"

- Upper Mid Section20.06"

- Fly Section17.32"

The ladder shall be designed to provide continuous egress for firefighters and civilians from an elevated position to the ground.

The egress section shall be designed to maintain the rated load of the aerial device. It shall be bolted on for easy replacement. There shall be a tow eye welded on to each side of the egress.

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Bidder Complies	
Yes	No

VERTICAL HEIGHT
The ladder shall extend to a minimum height of 107' above the ground at full extension and elevation. The measurement of height shall be consistent with NFPA standards.

HORIZONTAL REACH
The rated horizontal reach shall be 100' (no exception). The measurement of horizontal reach shall be consistent with NFPA standards.

TURNTABLE
The upper turntable assembly shall connect the aerial ladder to the turntable bearing. The steel structure shall have a mounting position for the aerial elevation cylinders, ladder connecting pins, and upper turntable operator's position.

The turntable shall be a 0.375" thick steel deck, coated with a non-skid, chemical resistant material in the walking areas. The stepping surfaces shall meet the skid-resistance requirements of the current NFPA 1901 standard.

The turntable handrails shall be a minimum 42.00" high and shall not increase the overall travel height of the vehicle. The handrails shall be constructed from aluminum and have a slip resistant knurled surface. The turntable vertical handrail spacing shall be designed with a 44.00" wide x 27.00" high opening to allow for equipment to pass through from the ground to the aerial ladder. The opening shall be located at the center, rear of the turntable.

ELEVATION SYSTEM
Dual 5.50" diameter elevating cylinders shall be mounted on the underside of the base section of the ladder, one (1) on each side. One (1) 2.25" diameter stainless steel pin shall fasten each cylinder to the ladder and one (1) 2.50" diameter stainless steel pin shall fasten each cylinder to the turntable. The pins shall have 125,000 psi minimum yield strength and shall be secured with 0.50" Grade 8 bolts with castle nut and cotter pin. The bolts are to ensure that the pins do not walk out of the mounting brackets on the turntable and base section.

The elevating cylinders shall be mounted utilizing maintenance-free spherical bearings on both ends of the cylinders (no exception). The aerial base pivot bearings shall be maintenance-free type bearings with no external lubrication required (no exception). The cylinders shall function only to elevate the ladder and not as a structural member to stabilize the ladder side movement. The elevating cylinders shall be provided with pilot-operated check valves on the barrel and rod side of the piston to prevent movement of the ladder in case of a loss of hydraulic pressure. The operation envelope shall be 10 degrees below horizontal to 77 degrees above horizontal.

The elevation system shall be designed following NFPA standards. The elevation hydraulic cylinders shall incorporate cushions on the upper limit of travel.

The lift cylinders shall be equipped with integral holding valves located in the cylinder to prevent the unit from descending should the charged lines be severed, at any point within the hydraulic system and to maintain the ladder in the bedded position during road travel. The integral holding valves shall NOT be located in the transfer tubes.

	Bidder Complies	
	Yes	No

The elevation system shall be controlled by the microprocessor. Linear transducers shall measure the extension of the elevation cylinder. The microprocessor shall provide the following features:

- Collision avoidance of the elevation system to prevent accidental body damage

- Automatic deceleration when the aerial device is lowered into the cradle

- Automatic deceleration at the end of stroke, in maximum raise and lower positions

- Deceleration of the aerial device at the limits of travel.

EXTENSION/RETRACTION SYSTEM

A hydraulically powered, extension and retraction system shall be provided through dual hydraulic cylinders and wire ropes. Each set shall be capable of operating the ladder in the event of a failure, of the other. For safety, systems that use only a single extension/retraction system shall not be acceptable. The extension cylinder rod shall be chrome plated to provide smooth operation of the aerial device and reduce seal wear. The extension/retraction cylinders shall be equipped, with integral holding valves, to prevent the unit from retracting should the charged line be severed, at any point within the hydraulic system. The integral holding valves shall NOT be located in the transfer tubes.

Wire ropes and attaching systems used to extend and retract the fly sections shall have a 5:1 safety factor based on the ultimate strength under all operating conditions. The factor of safety for the wire rope shall remain above 2:1 during any extension or retraction stall. The minimum ratio of the diameter of wire rope used to the diameter of the sheave used shall be 1:12. Wire ropes shall be constructed of seven (7) strands over an inner wire for increased flexibility. The wire rope shall be galvanized to reduce corrosion.

The extension/retraction system shall be controlled by the microprocessor. Linear transducers shall measure the ladder extension. The microprocessor shall provide the following features:

- Automatic deceleration at the end of stroke, in maximum extend and retract positions All

sheaves shall require lubrication. They shall have bronze bushings and grease zerks.

MANUAL OVERRIDE CONTROLS

Manual override controls shall be provided for all aerial and stabilizer functions.

LADDER SLIDE MECHANISM

UHMW polyethylene wear pads shall be used between the telescoping ladder sections, to provide greater bearing surface area for load transfer. Adjustable slide pads shall be used to control side play between the ladder sections.

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	Bidder Complies	
	Yes	No

ROTATION SYSTEM

The aerial shall be supplied with a powered rotation system as outlined in NFPA standards. The hydraulic rotation motor shall provide continuous rotation under all rated conditions and be supplied with a brake to prevent unintentional rotation. One (1) hydraulically driven, planetary gear box with drive speed reducers shall be used to provide infinite and minute rotation control throughout the entire rotational travel. One (1) spring applied, hydraulically released disc type swing brake shall be furnished to provide positive braking of the turntable assembly. Provisions shall be made for emergency operation of the rotation system should complete loss of normal hydraulic power occur. The hydraulic system shall be equipped with pressure relief valves which shall limit the rotational torque to a nondestructive power. The gearbox shall have a minimum continuous torque rating of 80,000 in. lbs. and a minimum intermittent rating of 160,000 in. lbs. The turntable bearing, ring gear teeth, pinion gear, planetary gearbox, and output shaft shall be certified by the manufacturer of the components for the application.

The rotation system shall be controlled by the microprocessor. The microprocessor shall provide the following features:

- Collision avoidance to prevent accidental body damage

- Prevent the aerial from being rotated into an unstable condition.

ROTATION INTERLOCK

The microprocessor shall be used to prevent the rotation of the aerial device to the side in which the stabilizers have not been fully deployed (short-jacked). The microprocessor shall allow full and unrestricted use of the aerial, in the 180-degree area, on the side(s) where the stabilizers have been fully deployed. The system shall also have a manual override, to comply with NFPA 1901. SYSTEMS THAT PERMIT THE AERIAL TO ROTATE TO THE "SHORT JACK" SIDE, WITHOUT AUTOMATICALLY STOPPING THE ROTATION AND/OR WITHOUT ACTUATION OF THE "MANUAL OVERRIDE", SHALL NOT BE ACCEPTED. SYSTEMS THAT ONLY INCLUDE AN ALARM ARE NOT CONSIDERED AN INTERLOCK AND SHALL NOT BE ACCEPTED.

LADDER CRADLE INTERLOCK SYSTEM

A ladder cradle interlock system shall be provided through the microprocessor to prevent the lifting of the aerial device from the nested position until the operator places all the stabilizers in a

load supporting configuration. A switch shall be installed at the boom support to prevent operation of the stabilizers once the aerial has been elevated from the nested position.

AERIAL TORQUE BOX/PEDESTAL

The pedestal assembly shall be a welded assembly made of high strength 0.25" plate. The vertical member shall be a 0.375" reinforced wall cylinder with a 28.00" outside diameter and shall connect the rotation bearing mounting plate to the lower substructure.

The pedestal assembly shall be bolted to the chassis frame with 0.88" diameter Grade 8 bolts and shall be utilized to mount the outrigger jacks and reservoir for the aerial hydraulic system.

LOAD CAPACITIES

The following load capacities shall be established with the stabilizers at full horizontal extension and placed in the down position to level the truck and to relieve the weight from the tires and axles. Capacities shall be based upon full extension and 360-degree rotation.

A load chart, visible at the operator's station, shall be provided. The load chart shall show the recommended safe load at any condition of the aerial device's elevation and extension (no exception).

50 MPH WIND CONDITIONS/WATERWAY DRY

Degrees of Elevation	-10 to 9	10 to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 77
Egress	750	750	750	750	750	750	750	750
Fly	-	-	-	-	-	250	500	750
Upper Mid	-	-	-	-	250	500	1000	1000
Lower Mid	-	-	-	-	500	750	1000	1000
Base	-	-	-	500	500	1000	1000	1000

50 MPH WIND CONDITIONS/WATERWAY CHARGED

Degrees of Elevation	-10 to 9	10 to 19	20 to 29	30 to 39	40 to 49	50 to 59	60 to 69	70 to 77
Egress	500	500	500	500	500	500	500	500
Fly	-	-	-	-	-	250	500	500
Upper Mid	-	-	-	-	250	500	750	1000
Lower Mid	-	-	-	250	500	750	1000	1000
Base	-	-	250	500	750	1000	1000	1000

Reduced loads at the tip can be redistributed in 250 lb. increments to the fly, mid, or base sections as needed.

The tip capacity shall be reduced to zero when flowing water with the nozzle above the waterway centerline**.**

BOOM SUPPORT

A heavy-duty boom support shall be provided for support of the ladder in the travel position. On the base section of the ladder, a stainless-steel scuff plate shall be provided where the ladder comes into contact with the boom support.

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Bidder Complies	
Yes	No

AERIAL BOOM SUPPORT LIGHT

There shall be one (1) 190 lumen, 12" long, white LED strip light mounted on the boom support cradle. This light shall be activated when the aerial master switch is activated.

ROPE TIE DOWN AT GOOSENECK

There shall be two (2) pairs of rope tie downs provided each side of the tiller gooseneck in the forward and rearward locations. Equal quantities shall be provided on each side. The tie downs shall be rated for a straight line pull of 9000 lb. and shall be chrome plated.

AERIAL BOOM PANEL

There shall be one boom panel provided on each side of the aerial ladder base section. The boom panel shall be painted black to match aerial ladder.

The boom panels shall be designed so no mounting bolts are in the face of the panel. This shall keep the lettering surface free of holes.

EXTENSION INDICATOR

Extension markings and corresponding numerical indicators shall be provided along each inside and outside top rail of the base section of the aerial every 10'. They shall indicate various positions of extension up to full. Markings and indicators shall be clearly visible to the console operator. To aid in visibility during hours of darkness, the markings and numerical indicators shall be red reflective material.

FOLDING STEPS

One (1) set of folding steps shall be provided at the tip of the ladder. An additional set of folding steps shall be provided at the base of the fly section. The steps shall be bright finished, nonskid with a black coating.

AERIAL DEVICE RUNG COVERS

Each rung shall be covered with a secure, heavy-duty, fiberglass pultrusion that incorporates an aggressive, no-slip coating.

The rung covers shall be glued to each rung and shall be easily replaceable should the rung cover become damaged.

The center portion of each rung cover shall be black and the outside 2.00" edge at each side shall be black.

Under no circumstances shall the rung covers be fastened to the rungs using screws or rivets (no exception).

The rung covers shall have a 10-year, limited warranty.

LADDER STORAGE MOUNTING BRACKETS

Mounting shall be provided on the right side of the aerial device while viewed from the turntable for storage of one (1) roof ladder(s). The bracket(s) shall be located inboard of the

boom panel at the base section. The bracket(s) shall hold the boom panel as close to the base section as possible and include straps to secure the ladder.

The mounting brackets shall accommodate a 10' Duo-Safety roof ladder with butt spurs and hooks on both ends.

RUBBISH HOOK STORAGE MOUNTING BRACKETS

Mounting shall be provided on the left side of the aerial device while viewed from the turntable for storage of one (1) 10’ heavy duty rubbish hook with heavy duty D handle. The bracket(s) shall be located inboard of the boom panel at the base section.

TEMPORARY SCABBARD AT END OF AERIAL

There shall be a total of two (2) vent saw scabbard(s) provided. The scabbard(s) shall be mounted on each side of the aerial tip. The scabbard(s) shall be DA finished.

LIGHTS FOR TURNTABLE WALKWAY

There shall be white LED lights provided at the aerial turntable. The lights shall be located to illuminate the entire walking surface of the turntable including the area around the turntable console. These lights shall be activated by the aerial master switch.

TURNTABLE CONSOLE LIGHTING

There shall be one (1), white LED light strip mounted in the turntable console cover to illuminate the controls located on both the upper and lower portion of the turntable control station. These lights shall be activated by the aerial master switch.

ROTATION BEARING COVER

An aluminum treadplate cover shall be fitted over the aerial rotation bearing and drive pinion gear(s). The cover shall be attached to the underside of the turntable deck.

INFORMATION CENTER

There shall be an information center provided at the aerial turntable control station. The information center shall operate in temperatures from -40 to 185 degrees Fahrenheit. The information center shall employ a Linux operating system and a 7.00" (diagonal measurement) LCD display. The LCD shall have a minimum 400nits rated, color display. The LCD shall be

sunlight readable. The LCD display shall be encased in an ABS, black plastic housing with a gray decal. There shall be five (5), weather-resistant user interface switches provided. The LCD display can be changed to an available foreign language.

OPERATION

The information center shall be designed for easy operation in everyday use. There shall be a page button to cycle from one screen to the next screen in a rotating fashion. A video button shall allow an NTSC signal into the information center to be displayed on the LCD. If any button is pressed while viewing a video feed, the information center shall return to the vehicle information

	Bidder Complies	
	Yes	No

screens. There shall be a menu button to provide access to maintenance, setup, and diagnostic screens. All other button labels shall be specific to the information being viewed.

GENERAL SCREEN DESIGN

Where possible, background colors shall be used to provide vehicle information *At A Glance*. If the information provided on a screen is within acceptable limits, a green background color shall be used. If the information provided on a screen is not within acceptable limits, an amber background color shall indicate a caution condition and a red background color shall indicate a warning condition.

Every screen in the information center shall include the aerial tip temperature, the time (12- or 24-hour mode) and a text Alert Center. The time shall be synchronized between all MUX color displays located on the vehicle. The Alert Center shall display text messages for audible alarms. The text messages shall identify any items causing the audible alarm to sound. If more than one (1) audible alarm is activated, the text message for each alarm shall cycle every second until the problems have been resolved. The background for the Alert Center shall change to indicate the severity of the warning message. Amber shall indicate a caution condition and red shall indicate a warning condition. If a warning and a caution condition occur simultaneously, the red background color shall be shown for all Alert Center messages.

A label shall be provided for each button. The label shall indicate the function for each active button for each screen. If the button is not utilized on specific screens, it shall have a button label with no text.

Symbols shall accurately depict the aerial device type the information pertains to such as rear mount ladder, rear mount platform, mid-mount ladder or mid-mount platform.

PAGE SCREENS

The Information center shall include the following pages:

The Aerial Main and Load Chart page shall indicate the following information:

- Rungs Aligned and Rungs Not Aligned shall be indicated with text and respective green or red colored ladder symbols.

- Ladder Elevation shall be indicated via a fire apparatus vehicle with ladder symbol with the degree of elevation indicated between the vehicle and ladder.

- Water Flow (if applicable) shall be indicated via a water nozzle symbol and text indicating flow / time.

- Breathing Air Levels shall be indicated via an air bottle symbol and text indicating the percent (%) of air remaining. A green bar graphs shown inside the bottle shall indicate oxygen levels above 20%. A red bar graph shall indicate oxygen levels at or below 20%. When oxygen levels are at or below 10% the red bar graph shall flash.

EXHIBIT B (Tractor Drawn Aerial)	Bidder Complies	
	Yes	No
- The Aerial Load Chart shall indicate the load limit on each section of the ladder based on actual ladder position and water flow (if applicable). - *At A Glance* color features shall be utilized on this screen. Caution type conditions shall be indicated via a yellow background. Warning type conditions shall be indicated via a red background. Conditions operating within acceptable limits shall be indicated via a green background. The Aerial Reach and Hydraulic Systems page shall indicate the following information: - Aerial Hydraulic Oil Temperature shall be indicated with symbol and text. At a glance features shall be utilized. - Aerial Hydraulic Oil Pressure shall be indicated with a symbol and text. At a glance features shall be utilized. - The following calculations shall be indicated on a representative vehicle symbol: - Aerial Device Extension length. - Aerial Device Height indicating the height of the aerial device tip from the ground. - Aerial Device Reach indicating the horizontal distance the aerial reaches from the turntable. - Aerial Device Angle indicating the angle from the vehicle which the device is at. - *At A Glance* color features shall be utilized on this screen. Caution type conditions shall be indicated via a yellow background. Warning type conditions shall be indicated via a red background. Conditions operating within acceptable limits shall be indicated via a green background. The Level Vehicle page shall indicate the following information: - The grade of the vehicle shall be indicated via a fire apparatus vehicle symbol with the degree of grade shown in text format. The symbol shall tilt dependent on the vehicle grade. - The slope of the vehicle shall be indicated via a fire apparatus vehicle symbol with the degree of slope shown in text format. The symbol shall tilt dependent on the vehicle slope. - Outriggers status shall be indicated via a colored symbol for each outrigger present. Each outrigger status shall be defined as one of the following: - Outrigger stowed indicated with a silver pan located close to the vehicle - Outrigger fully extended indicated with a fully deployed green outrigger - Outrigger short-jacked indicated by a yellow outrigger partially deployed - Outrigger not set indicated by a red outrigger that is not set on the ground		

	Bidder Complies	
	Yes	No

- A text box located on the vehicle symbol shall be utilized to identify the overall status of the outrigger leveling system. The following status shall be indicated in the text box:

- Deployed status shall indicate all outriggers are properly set on the ground at full extension

- Shortjacked status shall indicate one or more outriggers are set on the ground but not fully extended.

- Not Set status shall indicate one or more outriggers is not properly set on the ground.

- Stowed status shall indicate all outriggers are stowed for vehicle travel.

- A bedding assist alert shall indicate that the aerial device is being aligned by the MUX system as the operator lowers the aerial device into the cradle with the joystick.

- *At A Glance* color features shall be utilized on this screen. Caution type conditions shall be indicated via a yellow background. Warning type conditions shall be indicated via a red background. Conditions operating within acceptable limits shall be indicated via a green background.

MENU SCREENS

The following screens shall be available through the Menu button:

The View System Information screen shall display aerial device hours, aerial PTO hours, ladder aligned for stowing, aerial rotation angle, total water flow (if applicable), and aerial waterway valve status (if applicable).

The Set Display Brightness screen shall allow brightness increase and decrease and include a default setting button.

The Configure Video Mode screen shall allow setting of video contrast, video color and video tint.

The Set Startup screen allows setting of the screen that shall be active at vehicle power-up.

The Set Date and Time screen has a 12- or 24-hour format and allows setting of the time and date.

The View Active Alarms screen shows a list of all active alarms including the date and time of each alarm occurrence and shows all alarms that are silenced.

The System Diagnostics screen allows the user to view system status for each module and its respective inputs and outputs. Viewable data shall include the module type and ID number; the module version; and module diagnostics information including input or output number, the circuit number connected to that input or output, the circuit name (item connected to the circuit), status of the input or output, and other module diagnostic information.

	Bidder Complies	
	Yes	No

Aerial calibrations screen indicates items that may be calibrated by the user and instructions to follow for proper calibration of the aerial device.

Button functions and button labels may change with each screen.

STABILIZER CONTROL STATION

There shall be an easily accessible control station located on the trailer gooseneck, one (1) each side of the apparatus. The following controls and indicator lights shall be clearly identified and conveniently located for ease of operation and viewing at each control station.

- Driver Side/Passenger Side In/Out control switches

- Driver Side/Passenger Side Up/Down control switches

- Driver Side/Passenger Side Fully Extended indicator lights

- Driver Side/Passenger Side Firm On Ground indicator lights

- Stabilizer Emergency Power control switch

- Trailer Level Assist control toggle switch

- Global Safety Interlock Override red guarded switch

- Aerial system Emergency Stop switch

- Aerial system Emergency Stop Activated indicator light

TURNTABLE CONTROL STATION

There shall be one (1) device control station located on the right side of the turntable so the operator may easily observe the ladder tip while operating the controls. All elevation, extension and rotation controls shall operate from this location. The controls shall permit the operator to

regulate the speed of the aerial functions, within the safe limits, as determined by the manufacturer and NFPA standards. Each control shall be equipped, with a positive lock to hold the control in a neutral position, preventing accidental activation. In addition to the neutral lock, a console cover shall be provided at the turntable control station.

The following items shall also be provided at the turntable control station, clearly identified and lighted for nighttime operation and conveniently located for ease of operation and viewing:

- Intercom controls

- Tip tracking light switch

- Emergency stop switch

- Emergency power unit switch

- Operator's load chart

- Two (2) position switch for selecting aerial operational speed

HIGH IDLE

The high idle shall be controlled by the microprocessor. The microprocessor shall automatically adjust the engine rpm to compensate for the amount of load placed upon the system. The system shall include a safety device that allows activation of the high idle, only when the parking brake is set, and the transmission is placed in neutral.

STABILIZERS

The vehicle shall come equipped with a stabilization system consisting of two (2) hydraulically operated out and down style stabilizers. This system shall meet or exceed all requirements of the NFPA specifications related to stabilization and setup on sloped surfaces.

The stabilizer/leveling jacks shall have a maximum spread of 17' measured from the centerline of the jack footpads when the beams are fully extended. The beams shall be 6.81" wide x 8.88" high with 3/4" thick top and bottom plates and 1/2" thick sides of 100,000-PSI minimum yield strength steel. The cylinders shall have pilot-operated check valves with thermal relief designed to ensure that the beams shall not drift out of the stowed position during travel. Wear pads shall guide the stabilizers.

The horizontal extension cylinders shall be totally enclosed within the beams and shall incorporate telescoping hydraulic tubing to supply the jack cylinder hydraulic power. Stabilizer hydraulic hoses shall remain stationary during operation of the stabilizers to prevent hose wear and potential failure. The cylinders shall be equipped with decelerators to reduce the speed of extension and retraction when the beams are near the fully retracted and extended positions. The stabilizer extension hydraulic cylinders shall have the following dimensions: 2.25" bore, 1.38" rod, and 57.25" stroke.

The vertical jack cylinders shall be capable of 12.00" ground penetration. The cylinders shall be supplied with pilot operated check valves on each jack cylinder to hold the cylinder in the stowed or working position, should a charged line be severed at any point in the hydraulic system. For safety, the integral holding valves shall be located in the cylinder base end, NOT in the transfer tube. Vertical jack cylinder rods shall be fully enclosed by a telescoping inner box to protect the cylinder rods from damage. The stabilizer jack hydraulic cylinders shall have the following dimensions: 4.25" bore, 3.00" rod, and 28.88" stroke.

Each stabilizer jack shall have a polished stainless-steel shield. The stainless-steel shield shall be of the split-pan design and shall be a maximum 12.50" wide so as to allow the extension of the stabilizer between parked cars or other obstacles. This plate shall serve as a protective guard and a mounting surface for warning lights. The top, forward, and rear edges shall be flanged back 90 degrees for added strength.

Bidder Complies	
Yes	No

STABILIZER PADS

The stabilizer footpad shall be 12.00" in diameter. The footpad shall be attached to the jack cylinder rod by means of a machined ball at the end of the jack cylinder rod which mates to a socket machined into the footpad. The footpad shall have the ability to pivot 20 degrees from horizontal in any direction to allow setup on uneven terrain.

AUXILIARY STABILIZER PADS

An auxiliary ground pad shall be supplied for each stabilizer to provide additional load distribution on soft surfaces. The pads shall be 24.00" square and made from aluminum. The ground pressure shall not exceed 75 pounds per square inch when the ground pads are used, and the apparatus is fully loaded, and the aerial device is carrying its rated capacity in any position. There shall be one (1) pad located on each side of the apparatus, behind the stabilizers.

STABILIZER PADS, MODIFIED

The two (2) auxiliary stabilizer pads shall be modified so they can be installed on the bottom of the stabilizer. The auxiliary stabilizer pad holders on the truck shall also be modified.

STABILIZER CONTROLS

An electrically controlled hydraulic valve shall power stabilizer movement. The valve can also be manually controlled in the event of electrical malfunction. Hydraulic power override controls shall be incorporated into the valve. The manual override mechanism shall be completely sealed within the valve assembly to prevent any possibility of corrosion.

The stabilizer controls shall be located on the trailer gooseneck, one (1) each side of the apparatus, to provide the operator with a full view of each stabilizer being positioned. Each stabilizer control panel shall include the following:

- Driver Side/Passenger Side In/Out control toggle switches
- Driver Side/Passenger Side Up/Down control toggle switches
- Driver Side/Passenger Side Fully Extended indicator lights
- Driver Side/Passenger Side Firm On Ground indicator lights
- Stabilizer Emergency Power control toggle switch
- Trailer Level Assist control toggle switch
- Global Safety Interlock Override red guarded toggle switch
- Aerial system Emergency Stop mushroom switch
- Aerial system Emergency Stop Activated indicator light

As a safety device, an electrically actuated diverter valve shall be provided. The hydraulic power shall be diverted to the aerial ladder controls automatically the instant all stabilizer jacks are firmly planted on the ground. Once the aerial ladder is raised from the bedded position, the

stabilizer hydraulic power is cut off so the stabilizers shall not accidentally be moved while the aerial is being operated.

To aid in leveling the unit, two bubble type angle indicators shall be located near the stabilizer controls. One indicator shall show the angle of the truck from the front to rear and the other shall show the side to side angle of the truck. The indicators shall be color coded green to show when the truck has been properly leveled allowing the aerial device to be operated at full capacity.

A stabilizer deployment audible warning alarm shall be provided at each side of the body, activated by the stabilizer movement.

A "Stabilizers Not Stowed" indicator light shall be provided in the cab within view of the driver. It shall illuminate automatically whenever the stabilizers are not fully stowed to prevent damage to the vehicle if it is moved. The stabilizer system shall also be wired to the "Do Not Move Truck" indicator light. This light shall flash whenever the apparatus parking brake is not engaged, and the stabilizers are not fully stowed.

STABILIZER PINS

The stabilizer jacks shall not have holes for the stabilizer pins.

STABILIZER CONTROL BOX DOORS

There shall be aluminum treadplate doors hinged on the bottom with a flush lift and turn latch provided over each stabilizer control box.

VALVE/POWER DISTRIBUTION BOX ACCESS DOOR

There shall be aluminum treadplate doors with a flush lift and turn latch provided over the valve and power distribution box doors. These doors shall be bottom hinged.

STABILIZER PLACEMENT

There shall be two (2) cameras provided and installed on the body, one (1) directly above each stabilizer. The cameras shall be activated with a switch in the cab and shall provide a picture to specify the fully extended stabilizer position allowing the driver the ability to position the vehicle with the proper clearance for stabilizer deployment.

STABILIZER GROUND ILLUMINATION LIGHT

There shall be two (2) 12-volt DC LED spot light(s) provided. The light(s) shall be recessed in the stationary stabilizer pan.

The light(s) shall indicate where the stabilizer pad will be set down.

The painted parts of this light assembly to be black.

The light(s) shall be recessed into the stabilizer side cover plate on the aerial platform body and trimmed with a polished stainless-steel housing/garnish ring.

The light(s) shall be activated per the following selections:

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

HYDRAULIC SYSTEM

All hose assemblies shall be assembled and crimped by the hose manufacturers certified technician.

All manufacturing employees responsible for the installation of hydraulic components shall be properly trained. Training shall include: proper handling, installation, torque requirements, cleanliness and quality control procedures for hydraulic components.

Hoses used in the aerial hydraulic system shall be of a premium quality hose with a high abrasion resistant cover. All pressure hoses shall have a working pressure of 4000 psi and a burst pressure rating of 16,000 psi.

All hydraulic fittings and tubing shall be plated to minimize corrosion.

The fitting shall use an O-ring seal where possible to minimize hydraulic leaks.

An interlock shall be provided that prevents activation of the hydraulic pump until the transmission is placed in neutral and the parking brake is set as outlined in the current NFPA 1901 standard.

The system shall meet the performance requirement of the current NFPA 1901 standard, which requires adequate cooling less than 2.5 hours of operations.

All hydraulic components that are non-sealing whose failure could result in the movement of the aerial shall comply with current NFPA 1901 standards and have burst strength of 4:1.

Dynamic sealing components whose failure could cause aerial movement shall have a margin of 2:1 on maximum operating pressure per the current NFPA 1901 standard.

All hydraulic hoses, tubes, and connections shall have a minimum burst strength of 4:1 per the current NFPA 1901 standard.

A chassis mounted positive displacement piston pump for consistent pressure and rapid responses shall supply hydraulic power for all aerial operations. The positive displacement pump shall provide 3,150psi. The hydraulic pump shall be solely dedicated to aerial operations (no exception).

The hydraulic oil shall be a premium Multi-Vis product having a leading-edge additive package, provide oxidation stability, be extremely shear stable and maximum anti-wear properties. All oil delivered to the manufacturing site shall have a minimum ISO cleanliness level of 18/15/13.

EXHIBIT B (Tractor Drawn Aerial)

	Bidder Complies	
	Yes	No

Each aerial shall be evaluated as to the region and climate where it shall be used to determine the optimum viscosity and proper oil grade. Oil viscosity shall be based on an optimum range of 80 to 1000 SUS during normal aerial use. Before shipment of the unit, an oil sample shall be taken and analyzed to confirm the oil is within the allowable ISO grade tolerance.

The aerial hydraulic system shall have a minimum oil cleanliness level of ISO 18/15/13 based on the ISO 4406:1999 cleanliness standard. Each customer shall receive a certificate of actual cleanliness test results and an explanation of the rating system.

Each aerial shall include an oil sample port, identified with a yellow dust cap and a label, for subsequent customer testing.

Ball valves shall be provided in the hydraulic suction lines to permit component servicing without draining the oil reservoir.

The aerial shall incorporate the use of trombone steel tubes inside the stabilizer beams to eliminate hydraulic hose wear and leaks.

Hydraulic power to the ladder shall be transferred from the pedestal by a hydraulic swivel.

The system hydraulic pressure shall be displayed on the turntable display.

The hydraulic system shall be additionally protected from excessive pressure by a secondary pressure relief valve set at 3,150 psi. In the event the main hydraulic pump compensator malfunctions, the secondary relief shall prevent system damage.

HYDRAULIC CYLINDERS

All cylinders used on the aerial device shall be produced by a manufacturer that specializes in the manufacture of hydraulic cylinders.

Each cylinder shall include integral safety holding cartridges. No manifold or transfer tube mounted cartridge shall be acceptable.

Each cylinder shall be designed to a minimum safety factor of 4:1 to failure.

All safety holding cartridges shall be installed at the cylinder manufacturer, in a controlled clean environment to avoid possible contamination and or failure.

POWER TAKEOFF/HYDRAULIC PUMP

The apparatus shall be equipped with a power takeoff driven by the chassis transmission and actuated by an electric shift, located inside the cab. The power takeoff which drives the hydraulic pump shall meet all the requirements for the aerial unit operations.

Am amber indicator light shall be installed on the cab instrument panel to notify the operator that the power takeoff is engaged.

	Bidder Complies	
	Yes	No

An interlock shall be provided that allows operation of the aerial power takeoff shift only after the chassis spring brake has been set and the chassis transmission has either been placed in the neutral position or drive position after the driveline has been disengaged from the rear axle.

The hydraulic system shall be supplied by a variable displacement load and pressure compensating piston pump. The pump shall meet the demands of all three simultaneous aerial functions. The pump shall provide proper flow for single aerial function with the engine at idle speed. A switch shall be provided on the control console to increase the engine speed for multiple function operation.

EMERGENCY PUMP

The hydraulic system shall be designed with an auxiliary power unit meeting the guidelines of the current NFPA 1901 standard.

The aerial shall be equipped with an emergency hydraulic pump, electrically driven from the truck batteries. The pump shall be capable of running for 30 minutes for limited aerial functions to stow the unit in case of a main pump or truck system failure. A momentary switch shall be located at the stabilizer and aerial control locations to activate the emergency pump.

AERIAL CONTROL VALVE

The aerial hydraulic control valve shall be designed with special spool flows, limiting the oil flow for the designed function speed. The valve shall be electrically controlled and be in the control console with the handles oriented downward for manual operation. The activation handles shall be spaced a minimum of 3.50" for ease of operation. The valve spools shall be designed to bleed off downstream pressure, in the neutral position and allow proper sealing of any cylinder holding cartridge.

OIL RESERVOIR

The oil reservoir shall have a minimum capacity of 40 gallons. The oil fill location shall be easily accessible and be labeled "Hydraulic Oil Only" and also indicate the grade of oil that is installed in the reservoir. The fill cap shall have a 40-micron filter to provide protection from contamination. A drain hose shall be included and shall terminate with a quarter turn ball valve.

Two suction ports shall be provided, one for the main hydraulic pump and one for the emergency pump. The main suction shall be slightly elevated off the bottom of the reservoir and include a 100-mesh suction strainer. The emergency suction port shall be closer to the bottom of the reservoir to provide some reserve oil for emergency operation.

A six (6) disc type magnetic drain shall also be provided to collect any ferrous contaminants.

A combination sight glass and thermometer shall be mounted to the reservoir in an easily viewable location.

The hydraulic oil reservoir shall be labeled per the current edition of NFPA 1901 standard.

RETURN FILTER

The low-pressure oil return filter shall be remote mounted and designed to prevent oil loss during filter change. A 50-psi bypass shall be included to protect the element and hydraulic system during lower than normal operating temperatures. The system shall incorporate the following filter to provide dependable service:

- return filter: beta 200 at 6 micron

HYDRAULIC SWIVEL

The aerial ladder shall be equipped with a three (3) port, high pressure hydraulic swivel which shall connect the hydraulic lines from the hydraulic pump and reservoir through the rotation point to the aerial control bank. The hydraulic swivel shall allow for 360-degree continuous rotation of the aerial.

ELECTRIC SWIVEL

The ladder shall be equipped with an electric swivel to allow 360 degrees rotation of the aerial while connecting all electrical circuits through the rotation point. A minimum of 28 collector rings

shall be provided that are capable of supplying 20-amp continuous service. All collector rings shall be enclosed and protected with desiccant plugs against condensation and corrosion. No oil or silicone shall be used.

12-BIT ABSOLUTE ENCODER

The aerial ladder shall be equipped with a 12-Bit Absolute Encoder which provides 4096 counts per shaft turn for position and direction reference.

The 12-Bit Absolute Encoder shall provide a unique binary word to reference each position and direction for all 360 degrees of rotation.

If the power is interrupted for any reason, the 12-Bit Absolute Encoder shall allow power to be returned to the system without having to re-zero the settings.

The 12-Bit Absolute Encoder shall be an integral part of a micro-processor-based control system.

ELECTRICAL SYSTEM

The aerial device shall utilize a microprocessor-based control system. The system shall consist of the following components:

Control System Modules

Each of the control system modules shall be configured as follows:

Sealed to a NEMA 4X rating

Operating range from -40 degrees F to 156 degrees F (-40 degrees C to 70 degrees C)

EXHIBIT B (Tractor Drawn Aerial)	Bidder Complies	
	Yes	No
Communicate using J1939 data link		
Two (2) diagnostic LED lights		
One (1) green light that illuminates when module has power (B+) and ground		
One (1) red light that flashes to indicate the module is capable of communicating via the data link		
Up to 16 diagnostic LEDs on each module		
Ground matrix identification system		
The following control system modules shall be used:		
Control Module		
Main controller for the system		
USB connection allows for computer diagnostics		
Power Module		
Built-in fault sensing		
Eight (8) digital outputs		
Pulse width modulating (PWM) capable		
10A continuous per output		
Circuit protection based on actual current draw (not affected by heat)		
Current Control Module		
Built-in fault sensing		
Three (3) analog inputs		
Eight (8) digital outputs		
Pulse width modulating (PWM) capable		
3A continuous per output		
Closed Loop System		
Circuit protection based on actual current draw (not affected by heat)		
Input Module		
16 software selectable (digital or analog) inputs		
Output Module		
16 digital outputs		
Input/Output Module		

Eight (8) software selectable (digital or analog) inputs

Eight (8) digital outputs

AERIAL TIP AND TRACKING LIGHTS

There shall be four (4) 12-volt DC lights furnished on the aerial device. The lights shall be mounted below the handrail height so as not to increase the overall height of the apparatus. The lights shall be installed per the following:

- One (1), 5,090 lumens light with chrome cover and switch shall be mounted on the left side of the base section of the aerial device. The left side-tracking light to include flood optics.
- One (1), 9,260 lumens light with low profile mount shall be mounted on the left side of the fly section of the aerial device. The driver's side tip light to include spot and flood optics.
- One (1), 9,260 lumens light with low profile mount shall be mounted on the right side of the fly section of the aerial device. The right-side tip light to include a combination of spot and flood optics.
- One (1), 5,090 lumens light with chrome cover and switch shall be mounted on the right side of the base section of the aerial device. The right-side tracking light to include flood optics.
- The tip light(s) to include white painted parts and the tracking light(s) to include white painted parts.

The power to the lights shall be controlled by a switch located platform/tip and turntable.

LIGHTING ON AERIAL LADDER

There shall be LED rung lighting provided on both sides of the aerial ladder base, lower and upper mid, and fly sections. The lighting shall be located adjacent to the ladder rungs along the lower rail of the ladder sections and shall run the length of the ladder section.

The color of the sections shall be:

- The base section of the ladder to be blue.
- The lower mid-section of the ladder to be blue.
- The upper mid-section of the ladder to be blue.
- The fly section of the ladder to be blue and the last four (4) rungs to be red.

The LED rung lighting shall be activated when a switch at the turntable operator's panel is activated through the master battery switch.

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

	Bidder Complies	
	Yes	No

STABILIZER WARNING LIGHTS

There shall be two (2) LED flashing warning lights with clear lenses and chrome flanges installed on the stabilizer cover panels, one (1) each side.

- The LED lights shall be red.

These warning lights shall be activated by the same switch as the side warning lights.

STABILIZER BEAM WARNING LIGHTS

Two (2) 4.00" diameter red LED flashing lights shall be mounted on each stabilizer, one (1) facing forward and one (1) facing rearward.

The lights shall be recessed in the horizontal beam of the stabilizer.

These warning lights shall be activated with the aerial master switch.

STABILIZER SCENE LIGHTS

There shall be one (1) 4.00" incandescent, scene light installed under each stabilizer beam to illuminate the surrounding area. A total of two (2) lights shall be installed. These lights shall be activated by the aerial master switch.

120 VOLT LIGHTING AT TIP

There shall be Two (2) Whelen, Model PFP2AC, white 120-volt LED floodlight(s) installed in white Whelen, Model PBA206, bail bracket(s) located on the tip of the ladder, on the driver and passenger side mounted vertically and allowed to swivel.

There shall be a reinforcement plate provided for the base of the bail bracket to hold the light to the special mounting bracket.

Light(s) shall be switched at the driver and passenger side.

120 VOLT LIGHTING AT TIP

There shall be Two (2) Whelen, Model PFP2AC, black 120-volt LED floodlight(s) installed in white Whelen, Model PBA206, bail bracket(s) located on the tip of the base rail section of the ladder, driver and passenger side mounted vertically and allowed to swivel. There shall be a special bracket welded at the tip of the base section of the ladder to hold the light(s).

There shall be a reinforcement plate provided for the base of the bail bracket to hold the light to the special mounting bracket.

Light(s) shall be switched at the light head and turntable.

2-WAY AERIAL COMMUNICATION SYSTEM

There shall be a two-way intercom system provided. The control module shall be located on the turntable operator console, provided there is room, and have an LED volume display and push-button volume control.

A hands-free module shall be located at the aerial tip or platform and constantly transmit to the other module unless the control module push-to-talk button is pressed.

Each intercom unit shall be weatherproof.

ROPE TIE BAR AT BASE SECTION, RESCUE LIFTING SYSTEM

A removable bracket shall be supplied at the rear of the base section, attached between the left hand and right-hand rear hand rails. The bracket shall provide Lyfe Pulley rope tie off and/or guide points spaced 5.75" apart, centered between the rear hand rails. The bracket shall be designed to be easily removable and not interfere with a fully retracted ladder assembly when attached to the base section. A DA finished storage box for the bracket shall be provided on the outside rear of the base section.

LIFTING EYE ASSEMBLY - ROPE RESCUE ATTACHMENT

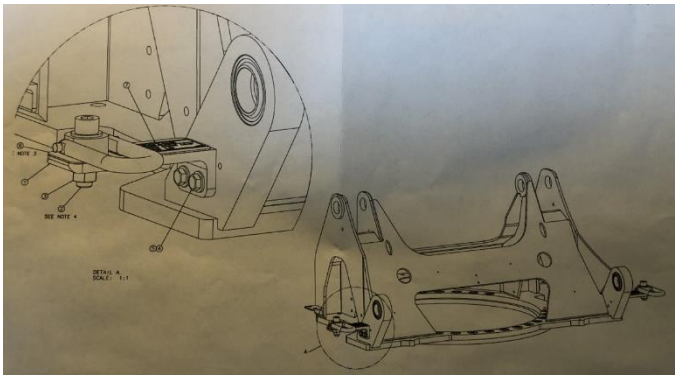
A lifting eye assembly shall be provided that is designed to evenly distribute load at the tip of the aerial. The lift eye assembly is retained by two (2) locking pins, one (1) at each end outboard side of the egress. Leveling is maintained by the lifting eye assembly rotating within the egress mounting.

RESCUE LIFTING SYSTEM

A rescue lifting attachment shall be provided. The lifting attachment shall mount to the aerial egress and shall consist of a pair of nylatron pulleys mounted to a stainless-steel shaft. The pulleys shall be adjustable from side to side and shall have a total lifting capacity of 500lb, regardless of whether one (1) or both pulleys are being utilized.

ROPE TIE OFF

There shall be a rope tie off on the turntable aerial hydraulic arms rated at 9,000 lbs. straight pull.



AIR HORN CONTROL AT AERIAL TURNTABLE

An air horn control button shall be provided at the aerial turntable. This button shall be red in color and properly labeled. Collector ring space must be available for this option to be utilized.

AERIAL TURNTABLE SAFETY BARS

Safety bars shall be installed at the aerial turntable.

EXHIBIT B (Tractor Drawn Aerial)

Bidder Complies	
Yes	No

WATER SYSTEM

A waterway system shall be provided consisting of the following components and features:

A 5.00" pipe shall be connected to the water supply on one end and to a 5.00" internal diameter water swivel at the rotation point of the turntable. The water swivel shall permit 360-degree continuous rotation of the aerial device.

The 5.00" waterway swivel is to be routed through the rotation point up to the heel pin swivel. The heel pin swivel shall allow the water to flow to the ladder pipe while elevating the aerial ladder from -10 degrees to 77 degrees. The heel pivot pin is not integral with the waterway swivel at any point. The design of the waterway shall allow complete servicing of the waterway swivel without disturbing the heel pivot pin.

The integral telescopic water system shall consist of a 4.50" diameter tube in the base section, a 4.00" diameter tube in the mid-section and a 3.50" diameter tube in the fly section. The telescopic waterway shall be constructed of anodized aluminum pipe.

The aerial shall be capable of discharging up to 1000 gpm at 100 psi parallel to the ladder and 90 degrees to each side of center while maintaining the rated tip load.

The aerial shall be capable of discharging between 1001 and up to 1500 gallons per minute at 100 psi parallel to the ladder and 40 degrees to each side of center while maintaining the rated tip load.

The master stream shall be capable of flow up to 30 degrees above horizontal.

An adjustable pressure relief valve shall be furnished to protect the aerial waterway from a pressure surge.

Two (2) 1.50" drain valves shall be located at the lowest points of the waterway system and shall be routed to drain through the center of the 5th wheel.

WATERWAY SEALS

The waterway seals shall be of type-B PolyPak design, composed of nitroxile seal and a nitrile wiper, which together offer maximum stability and extrusion resistance on the waterway. The seal shall be capable of withstanding pressures up to 2000 psi, temperatures in excess of 250 degrees Fahrenheit and have resistance to all foam generating solutions. The seals shall be internally lubricated.

The waterway seals shall have automatic centering guides constructed of synthetic thermalpolymer. The guides shall provide positive centering of the extendible sections within each other and the base section to insure longer service life and smoother operation.

EXHIBIT B (Tractor Drawn Aerial)

	Bidder Complies	
	Yes	No

AERIAL MONITOR

A monitor with stow and deploy shall be provided at the tip with an Akron 1500 gpm Model 5178. This monitor shall allow for an additional 30 degrees of travel above horizontal at the aerial tip.

The monitor's functions shall be controlled electrically from two (2) separate locations. One (1) control shall be located at the control console and the other at the ladder tip.

There shall be a courtesy light at the tip of the aerial to illuminate the controls.

If the aerial has a quick-lock waterway, a limit switch shall be provided to disable the extended vertical travel when the monitor is locked to the lower ladder section.

AERIAL WATERWAY FLOW METER

Waterway flow, including total water flowed, shall be monitored by the microprocessor. An LCD display shall be located at the turntable control station.

AERIAL WATERWAY INLET

The aerial waterway shall be plumbed from the fifth wheel area to the waterway swivel with 4.00" pipe.

A 5.00" inlet shall be located on each side of the apparatus complete with a chrome plated cap.

The individual "line" pressure gauges for the inlets shall be provided.

They shall be a minimum of 3.50" in diameter and shall have white faces with black lettering.

Gauges shall be compound type with a vacuum/pressure range of 30.00"-0-600#.

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

WATERWAY LOCKING SYSTEM

The aerial ladder waterway monitor shall be capable of being positioned at either the fly section or at the next lower section of the ladder.

The monitor location shall be changeable by the use of a single handle, located at the side of the ladder.

The handle, attached to a cam bracket, shall simply be moved forward to lock the monitor at the fly section and back to lock it to the previous section.

There shall be no pins to remove and reinstall.

The monitor shall be operational at all times, regardless of its position, without connecting or disconnecting electrical lines.

Bidder Complies	
Yes	No

STORZ INLET ADAPTERS

There shall be a 4.00" FNST x 5.00" Storz adapter with blind cap provided on each aerial inlet.

2.50" AUXILIARY OUTLET AT AERIAL TIP

An auxiliary hose connection outlet shall be supplied at the tip of the aerial ladder. It shall be located on the left-hand side of the aerial waterway.

TOOLS

The following tools shall be provided for retorquing of all specified bolts as recommended by the manufacturer:

Torque Wrench

All Required Extensions, Sockets and Adapters

4-to-1 Multiplier

MANUALS

Two (2) operator maintenance manuals and two (2) wiring diagrams pertaining to the aerial device shall be provided with the apparatus at time of pick-up.

INITIAL INSTRUCTION

On initial delivery of the fire apparatus, the contractor shall supply a qualified representative to demonstrate the apparatus and provide initial instruction to the fire department regarding the operation, care, and maintenance of the apparatus for a period of three (3) consecutive days.

TILLER CAB

A permanently mounted tiller cab shall be located on top of the tiller trailer, to the rear of the aerial ladder.

The maximum overall height of the tiller cab shall not exceed 134.00" (no exception). The tiller cab shall be totally enclosed.

The cab windshield shall be automotive approved tinted safety glass and shall provide a minimum of 1,513 square inches of clear viewing area.

A smoked polycarbonate sun visor shall be provided in the tiller cab above the windshield. There shall be a black plastic thumb latch provided to help secure the sun visor in the stowed position.

Each side window, directly rearward of the windshield, shall be more than 536 square inches. The side windows, combined with the windshield, shall provide a minimum of 2,585 square inches of unobstructed viewing area.

EXHIBIT B (Tractor Drawn Aerial)

	Bidder Complies	
	Yes	No
In order to provide maximum visibility for the tillerman, there shall be no corner posts at the forward corners of the windshield (no exception).		
Two (2) slide back doors, one each side of cab shall be provided. Doors shall be mounted on top and bottom slides which shall be lockable in either open or closed position. A minimum door opening of 21.50" shall be provided when entering and exiting the tiller cab. The tiller cab doors shall be equipped with drop-down windows. The windows shall be 18.00" wide x 31.00" high.		
The rear wall of the tiller cab shall have a vertically-split sliding window. The window shall be 33.50" wide x 27.75" high.		
The tiller cab floor shall be constructed of aluminum treadplate.		
A two (2) speed intermittent electric windshield wiper with washer shall be provided for the front windshield.		
The windshield washer reservoir shall have a capacity of two (2) quarts and shall be located forward of the tiller cab.		
An adjustable, telescopic steering column shall be provided.		
The diagnostic plug for the trailer ABS system shall be provided in the driver side tiller access stepwell, behind the fuel fill door.		
The following controls/alarms shall be provided inside the tiller cab:		
- Buzzer signaling system with push button in tiller cab steering wheel as well as a labeled push button in the tractor cab, within reach of the driver.		
- Jackknife alarm		
The following shall be provided on the steering column support pedestal:		
- Two (2) heater/defroster outlets		
- Heater/defroster control switch		
The following controls/gauges shall be located in the upper control panel:		
- Step light switch		
- Tiller wheel position indicator gauge. (L-C-R)		
- Two (2) 2.00" diameter amber turn signals		
- Windshield wiper/washer control switch		

Bidder Complies	
Yes	No

TILLER CAB DOME LIGHT

There shall be one (1) dual LED dome light with black bezel installed in the tiller cab.

The color of the LED shall be red and white.

The white LED shall be controlled by the door switches and the lens switch.
The color LED shall be controlled by the lens switch.

In order to ensure exceptional illumination, the 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.

TILLER CAB HEATER

For the tillerman's comfort, the cab is equipped with a 13,650 BTU heater/defroster.

The heater shall have a multi-speed motor and thermostatic control located in the tiller cab within reach of the tillerman.

The heater shall be diesel/kerosene fueled and shall have a separate three (3) gallon fuel tank which shall provide a minimum of 23 hours of continuous running time.

The fuel tank shall be recessed in the body, behind the driver side tiller cab access steps.

There shall be a minimum of two (2) defrost outlets in the cab for maximum defrost performance.

The heater/defrost system shall have an airflow of 85 cfm.

TILLER CAB AIR CONDITIONING

Air conditioning shall be provided for the tiller cab.

The air conditioner shall have cooling capacity of 13,500 BTU.

The unit shall be 120-volt AC and shall be run off of the onboard generator. The full load amperage draw shall be 12.00 amps in the cooling mode.

The condenser shall be located ahead of the tiller cab on the top deck of the tiller trailer. The air conditioning unit shall not increase the overall height of the tiller cab.

TILLER CAB SEAT

A USSC, Model Magnus R-Back, air suspension seat shall be provided in the tiller cab. For increased convenience, the seat shall include a pneumatic control to adjust the height (5.00" travel) and horizontal position (6.00" travel). To provide flexibility for multiple driver configurations, the seat shall have a reclining back, adjustable from 90 degrees to 45 degrees rearward. For optimal comfort, the seat shall be provided with 17.00" deep foam. To ensure safe operation, the seat shall be equipped with seat belt sensors in the seat cushion and belt receptacle that shall activate an alarm indicating a seat is occupied but not buckled.

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

There shall be no seat riser provided in the tiller cab with this seat.

TILLER CAB STEPS

For access to the tiller cab, two (2) sets of steps shall be furnished at the rear of the apparatus, one set each side. The steps shall be moved rearward and be in alignment with the tiller cab door. The bottom three (3) access steps shall be full width, approximately 21.00" wide, and located in line with the tiller door. The top step shall be full width, approximately 18.50" wide. The steps shall be securely reinforced and constructed of aluminum treadplate. Handrails shall be provided on each side of the step assemblies for maximum safety. The steps shall be illuminated for nighttime operation.

JACKKNIFE ALARM

An audible and visual warning system shall be provided to warn both drivers when the jackknife position approaches the manufacturer's maximum allowable angle.

TILLER WARNING INDICATOR

A warning indicator in the tractor cab shall be activated if the parking brake is released and the tiller driver is not present in the tiller cab.

CONVEX MIRRORS (TILLER CAB)

An 8.00" diameter round convex mirror with adjustable arm shall be installed on each side of tiller cab and shall have double brackets to prevent shaking tiller trailer

TILLER CONVEX MIRRORS (CATWALK)

A convex mirror shall be provided on each side of the catwalk. The brackets shall be approximately 10.00" tall and angle outward so the tillerman can see the rear bumper in the mirrors. The brackets shall include an 8.00" convex mirror. Adjustable arms and have a double support bracket to prevent shaking.

TILLER TRAILER

The gooseneck area of the tiller trailer shall be constructed of 100,000 psi minimum yield strength steel.

The gooseneck area shall have a section modulus of 289.00 cu. in. and a resistance to bending moment of 28,900,000-inch pounds.

The gooseneck area shall be 46.00" wide x 13.50" deep.

The tiller trailer frame shall be box type construction to effectively resist trailer twist.

The side rails shall have a 13.38" tall web over the front and mid sections of the trailer, with a continuous smooth taper to a 10.75" over the tiller axle.

EXHIBIT B (Tractor Drawn Aerial)

Bidder Complies	
Yes	No

The frame rails shall be constructed of 80,000 psi minimum yield strength heat treated .38" thick steel, with 3.50" wide flanges and covered by top and bottom plates to form a ridged box structure. Cover plates shall be 50,000 psi minimum yield strength steel.

The tiller trailer frame shall have a section modulus of 257.70 cu. in., and a resisting bending moment (rbm) of 12,880,000-inch pounds over the critical regions of the frame assembly, with a section modulus of 18.96 cu. in. with a rbm of 2,085,803-inch pounds over the rear axle.

The overall length of the tiller trailer shall be 471.00". The gooseneck area of the trailer shall be extended 3.00".

WALKWAY, TURNTABLE TO BODY

A walkway shall be provided from the aerial turntable to the tiller body.

TILLER TRAILER NON-DRIVE AXLE

The tiller trailer axle shall be of the independent suspension design with a ground rating of 22,800 lb.

Upper and lower control arms shall be used on each side of the axle. Upper control arm castings shall be made of 100,000-psi yield strength 8630 steel and the lower control arm casting shall be made of 55,000-psi yield ductile iron.

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

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

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

Camber at load shall be zero degrees for optimum tire life.

The kingpin bearing shall be of low friction design and be sealed for life.

Toe links that are adjustable for alignment of the wheel to the center of the trailer shall be provided.

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

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

The turning angle shall be 24 degrees or greater.

	Bidder Complies	
	Yes	No

TILLER TRAILER NON-DRIVE AXLE WARRANTY

The non-drive axle system shall have a **three (3) year** parts and labor warranty.

TILLER TRAILER STEERING

Dual Sheppard M110 steering gears, with integral heavy-duty power steering, shall be provided.

The steering wheel shall be 18.00" in diameter, and capable of tilting and telescoping.

BRAKES

The tiller trailer brake calipers shall be air disc type. The brake rotors shall be 17.00" ventilated.

SUSPENSION

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

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

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

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

The torsion bar type spring and anchor lock system shall allow for simple lean adjustments without the use of shims. Adjustment for a lean shall be accomplished within 15 minutes. Anchor adjustment design is such that it allows 4.00" of ride height adjustment per side.

The independent suspension shall have been put through a durability test that simulated a minimum of 140,000 miles of inner city driving.

TIRES

Tiller trailer tires shall be 425/65R22.50 radials, 20 ply highway tread, rated for 22,800 lb. maximum axle load and 65 mph maximum speed.

WHEELS, TILLER

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

OIL SEALS

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

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

EXHIBIT B (Tractor Drawn Aerial)

Bidder Complies	
Yes	No

NFPA REQUIRED LOOSE EQUIPMENT PROVIDED BY FIRE DEPARTMENT

The following loose equipment as outlined in NFPA 1901, 2016 edition, section 8.9.3 shall be provided by the fire department.

- Two (2) 3 ft - 4 ft plaster hooks with D handles mounted in brackets fastened to the apparatus.
- Two (2) crowbars.
- Two (2) claw tools.
- Two (2) 12 lb. (5 kg) sledgehammers.
- One (1) SCBA complying with NFPA 1981 for each assigned seating position, but not fewer than four (4), mounted in brackets fastened to the apparatus or stored in containers supplied by the SCBA manufacturer.
- One (1) spare SCBA cylinder for each SCBA carried, each mounted in a bracket fastened to the apparatus or stored in a specially designed storage space(s).
- One (1) first aid kit.
- Six (6) salvage covers, each a minimum size of 12 ft × 18 ft (3.6 m × 5.5 m).
- Four (4) combination spanner wrenches.
- Two (2) scoop shovels.
- One (1) pair of bolt cutters, 24" (0.6 m) minimum.
- Four (4) ladder belts meeting the requirements of NFPA 1983.
- One (1) 150 ft (45 m) light-use life safety rope meeting the requirements of NFPA 1983.
- One (1) 150 ft (45 m) general-use life safety rope meeting the requirements of NFPA 1983.
- Two (2) 150 ft (45 m) utility ropes having a breaking strength of at least 5000 lb. (2300 kg).
- One (1) box of tools to include the following:

- one (1) hacksaw with three (3) blades

- one (1) keyhole saw

- one (1) 12" (.3 m) pipe wrench

-one (1) 24" (.6 m) pipe wrench

- one (1) ballpeen hammer

- one (1) pair of tin snips

- one (1) pair of pliers

- one (1) pair of lineman's pliers

- assorted types and sizes of screwdrivers

- assorted adjustable wrenches

- assorted combination wrenches

	Bidder Complies	
	Yes	No

- 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).
- One (1) double female 2.50" adapter with National Hose Threads (if equipped with a fire pump).
- One (1) double male 2.50" adapter with National Hose Threads (if equipped with a fire pump).
- One (1) rubber mallet, for use on suction hose connections (if equipped with a fire pump).
- Two (2) hydrant wrenches (if equipped with a fire pump).
- 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 equipped with a fire pump).
- 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 equipped with a fire pump).
- 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 equipped with a fire pump).
- 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 (if equipped with a fire pump).

DRY CHEMICAL EXTINGUISHER PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, section 8.9.3 requires one (1) approved dry chemical portable fire extinguisher with a minimum 80-B:C rating mounted in a bracket fastened to the apparatus.

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

Bidder Complies	
Yes	No

WATER EXTINGUISHER PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, section 8.9.3 requires one (1) 2.5 gallon or larger water extinguisher mounted in a bracket fastened to the apparatus.

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

FLATHEAD AXE PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, Section 8.9.3 requires two (2) flathead axes mounted in brackets fastened to the apparatus.

The axes are not on the apparatus as manufactured. The fire department shall provide and mount the axes.

PICKHEAD AXES PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2016 edition, Section 8.9.3 requires three (3) pickhead axes mounted in brackets fastened to the apparatus.

The axes are not on the apparatus as manufactured. The fire department shall provide and mount the axes.

PAINT

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

1. Manual Surface Preparation - All exposed metal surfaces on the custom cab and body shall be thoroughly cleaned and prepared for painting. Imperfections on the exterior surfaces shall be removed and sanded to a smooth finish. Exterior seams shall be sealed before painting. Exterior surfaces that shall not be painted include; chrome plating, polished stainless steel, anodized aluminum and bright aluminum treadplate.
2. Chemical Cleaning and Pretreatment - All surfaces shall be chemically cleaned to remove dirt, oil, grease, and metal oxides to ensure the subsequent coatings bond well. The aluminum surfaces shall be properly cleaned and treated using a high pressure, high temperature 4 step Acid Etch process. The steel and stainless surfaces shall be properly cleaned and treated using a high temperature 3 step process specifically designed for steel or stainless. The chemical treatment converts the metal surface to a passive condition to help prevent corrosion. A final pure water rinse shall be applied to all metal surfaces.
3. Surfacer Primer - The Surfacer Primer shall be applied to a chemically treated metal surface to provide a strong corrosion protective basecoat. A minimum thickness of 2 mils of Surfacer Primer is applied to surfaces that require a Critical aesthetic finish. The

   Surfacer Primer is a two-component high solids urethane that has excellent sanding properties and an extra smooth finish when sanded.

Bidder Complies	
Yes	No

4. Finish Sanding - The Surfacer Primer shall be sanded with a fine grit abrasive to achieve an ultra-smooth finish. This sanding process is critical to produce the smooth mirror like finish in the topcoat.
5. Sealer Primer - The Sealer Primer is applied prior to the Basecoat in all areas that have not been previously primed with the Surfacer Primer. The Sealer Primer is a two-component high solids urethane that goes on smooth and provides excellent gloss hold out when top coated.
6. Basecoat Paint - Two coats of a high performance, two component high solids polyurethane basecoat shall be applied. The Basecoat shall be applied to a thickness that shall achieve the proper color match. The Basecoat shall be used in conjunction with a urethane clear coat to provide protection from the environment.
7. Clear Coat - Two (2) coats of Clear Coat shall be applied over the Basecoat color. The Clear Coat is a two-component high solids urethane that provides superior gloss and durability to the exterior surfaces. Lap style and roll-up doors shall be Clear Coated to match the body. Paint warranty for the roll-up doors shall be provided by the roll-up door manufacture.

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

All removable items such as brackets, compartment doors, door hinges, and trim shall be removed and separately if required, to ensure paint behind all mounted items. Body assemblies that cannot be finish painted after assembly shall be finish painted before assembly.

The paint finish quality levels for critical areas of the apparatus (cab front and sides, body sides and doors, and boom lettering panels) are to meet or exceed Cadillac/General Motors GMW15777 global paint requirements. Orange peel levels are to meet or exceed the #6 A.C.T. standard in critical areas. These requirements must be met in order for the exterior paint finish to be considered acceptable. The manufacture's written paint standards shall be available upon request.
The cab shall be two-tone, with the upper section painted #101 black along with a shield design on the cab face and lower section of the cab and body painted #70 red.

EXHIBIT B (Tractor Drawn Aerial)

Bidder Complies	
Yes	No

PAINT - ENVIRONMENTAL IMPACT

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

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

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

PAINT

The cab shall be two-tone, with the upper section painted 101 black and the lower section of the cab painted 70 red.

The paint break shall be located to be determined.

PAINT CHASSIS FRAME ASSEMBLY

The chassis frame assembly shall be finished with a single system black top coat before the installation of the cab and body, and before installation of the engine and transmission assembly, air brake lines, electrical wire harnesses, etc.

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

- Frame rails
- Frame liners
- Cross members
- Axles
- Suspensions

- Steering gear
- Battery boxes
- Bumper extension weldment
- Frame extensions
- Body mounting angles
- Rear Body support substructure (front and rear)
- Pump house substructure
- Air tanks
- 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 FINISH

The interior of the compartments shall be dual action finished and not painted.

AERIAL DEVICE PAINT COLOR

The aerial device paint procedure shall consist of a seven (7) step finishing process as follows:

1. Manual Surface Preparation - All exposed metal surfaces on the aerial device structural components above the rotation point shall be thoroughly cleaned and mechanically shot-blasted to remove metal impurities and prepare the aerial for painting.

2. Zinc Rich Primer - Zinc rich primer shall be applied to the torque box and stabilizers.

3. Primer/Surfacer Coats - A two (2) component epoxy primer/surfacer shall be applied to the mechanically shot-blasted metal surfaces to provide a strong corrosion protective base coat and to smooth out the surface. All seams shall be caulked with a two (2) component epoxy caulk before painting.

4. Hand Sanding - The primer/surfacer coat of the outer surfaces of the hand rails and base rails shall be lightly sanded to a smooth finish.

5. Primer Coat - A two (2) component epoxy primer coat shall be applied over the sanded primer.

6. Topcoat Paint - Urethane base coat shall be applied to opacity for correct color matching.

7. Clear Coat - Two (2) coats of an automotive grade two (2) component urethane shall be applied.

	Bidder Complies	
	Yes	No

Surfaces that shall not be painted include all chrome plated, polished stainless steel, anodized aluminum and bright aluminum treadplate.

All buy out components, such as monitor, nozzle, gauges, etc. shall be supplied as received from the vendor.

Removable items such as brackets shall be removed and painted separately to ensure paint coverage behind all mounted items.

The aerial device components shall be painted as follows using the aforementioned seven (7) step finishing process:

- Aerial device ladder sections and extension cylinders: black 101
- Aerial turntable: black 101
- Aerial control console: black 101
- Aerial lift cylinders: black 101
- Aerial rotation motor (if applicable): black
- Aerial torque box, support structure, components below the rotation point, tiller axle and suspension: black 101
- Aerial stabilizers: black 101
- Aerial egress: #50 red (shall be contrasting color to the aerial device ladder sections)
- Aerial boom support: red 50

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" white stripe at the top with a 1.00" gap then a 6.00" black stripe with a 1.00" gap and a 1.00" white stripe on the bottom.

The reflective band provided on the cab face shall be at the headlight level.

REAR CHEVRON STRIPING

There shall be alternating chevron striping located on the rear-facing vertical surface of the apparatus including the rear door. The tillerman cab and rear bumper shall not 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.

CHEVRON STRIPING ON THE FRONT BUMPER

There shall be alternating chevron striping located on the front bumper.
The colors shall be black and red diamond grade.
The size of the striping shall be 6.00".

Bidder Complies	
Yes	No

REFLECTIVE STRIPE ON STABILIZERS

There shall be a 4.00" wide fluorescent yellow green diamond grade reflective stripe provided on the forward and rear facing side of all aerial stabilizers.

CAB DOOR REFLECTIVE STRIPE

A 6.00" x 16.00" 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. Color to be determined at Pre-Construction Conference.

This stripe shall meet the NFPA 1901 requirement.

REFLECTIVE STRIPE, TILLERMAN DOORS

A 6.00" x 16.00" reflective stripe shall be provided across the interior of each tillerman's entry door. The stripe shall be located approximately 1.00" up from the bottom, on the door panel. Color to be determined at Pre-Construction Conference.

This stripe shall meet the NFPA 1901 requirement.

LETTERING

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

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
- Engine Tires
- Wheels
- Cab
- Electrical, DC
- Air Systems
- Plumbing
- Appendix

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

EXHIBIT B (Tractor Drawn Aerial)

	Bidder Complies	
	Yes	No

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

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

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

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

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

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

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

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

REAR AXLE TWO (2) YEAR MATERIAL AND WORKMANSHIP WARRANTY
A **two (2) year** axle limited warranty shall be provided.

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

	Bidder Complies	
	Yes	No

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).

FIVE (5) YEAR MATERIAL AND WORKMANSHIP

The electronic modules and display(s) shall be provided with a five (5) year material and workmanship limited warranty. The warranty shall cover electronic modules to be free from failures caused by defects in material and workmanship.

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

CAMERA SYSTEM WARRANTY

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

COMPARTMENT LIGHT WARRANTY

The compartment lights shall not offer an extended warranty.

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).

EXHIBIT B (Tractor Drawn Aerial)

	Bidder Complies	
	Yes	No

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).

PUMP WARRANTY

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

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

TEN (10) YEAR PUMP PLUMBING WARRANTY

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

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

TWENTY (20) YEAR AERIAL DEVICE STRUCTURAL INTEGRITY WARRANTY

The aerial device shall be provided with a twenty (20) year 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. This warranty shall be limited to the torque box, turntable, aerial sections and other structural components.

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

AERIAL SWIVEL WARRANTY

A five (5) year limited swivel warranty shall be provided. A copy of the warranty certificate shall be submitted with the bid package (no exception).

HYDRAULIC SYSTEM COMPONENTS WARRANTY

Aerial hydraulic system components shall be provided with a five (5) year material and workmanship limited warranty.

HYDRAULIC SEAL WARRANTY

Aerial hydraulic seals shall be provided with a three (3) year material and workmanship limited warranty.

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

EXHIBIT B (Tractor Drawn Aerial)

	Bidder Complies	
	Yes	No

AERIAL WATERWAY WARRANTY
A ten (10) year limited waterway warranty shall be provided. A copy of the warranty certificate shall be submitted with the bid package (no exception).

FOUR (4) YEAR PRO-RATED PAINT AND CORROSION
The aerial device shall be provided with a four (4) year pro-rated paint and corrosion limited warranty. The warranty shall cover exterior painted surfaces of the aerial device 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).

SIX (6) YEAR GENERATOR MATERIAL AND WORKMANSHIP WARRANTY
A **six (6) year** generator limited warranty shall be provided.

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.

EXHIBIT B (Tractor Drawn Aerial)

	Bidder Complies	
	Yes	No

CAB INTEGRITY CERTIFICATION
The fire apparatus manufacturer shall provide, at the time of bid, a cab crash test certification.

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

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

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

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

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

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

CAB HEATER CERTIFICATION

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

EXHIBIT B (Tractor Drawn Aerial)

Bidder Complies	
Yes	No

CAB AIR CONDITIONING PERFORMANCE CERTIFICATION

Good cab air conditioning temperature and air flow performance keeps occupants comfortable, reduces humidity, and provides a climate for recuperation while at the scene. The cab air conditioning system shall cool the cab from a heat-soaked condition at 100 degrees Fahrenheit to an average of 72 degrees Fahrenheit in 30 minutes. The bidder shall certify that a substantially similar cab has been tested and has met these criteria.

AMP DRAW REPORT

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

The manufacturer of the apparatus shall provide the following:

- Documentation of the electrical system performance tests.
- A written load analysis, which shall include the following:
    - The nameplate rating of the alternator.
    - The alternator rating under the conditions specified per:
        - Applicable NFPA 1901 or 1906 (Current Edition).
    - The minimum continuous load of each component that is specified per:
        - Applicable NFPA 1901 or 1906 (Current Edition).
    - Additional loads that, when added to the minimum continuous load, determine the total connected load.
    - Each individual intermittent load.

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