VILLAGE OF ALSIP
COOK COUNTY, ILLINOIS
NOTICE TO EMERGENCY VEHICLE DEALERS/ MANUFACTURERS

The Village of Alsip will receive sealed proposals at the Clerk's office, 4500 W. 123rd Street, Alsip, Illinois, until 4:00 PM, October 17, 2025 for a:

Fire Engine (Pumper)

Proposals will be publicly read aloud on Monday, 7:35 PM on October 20 2025. No bid shall be withdrawn after the opening of the proposals without the consent of the President and Board of Trustees for a period of thirty (30) days after the scheduled time of closing bids.

All proposals shall be sealed in an envelope, addressed to the Village of Alsip, attention Village Clerk. The name and address of the bidder and the name of the project shall also appear on the outside of the envelope.

The Bid Documents, including specifications shall be obtained from the Village Clerk's office or the village website. The bid documents will be issued until 3:00 PM on October 17, 2025.

A certified check/bank draft drawn on a solvent bank, cashier's check or bid bond, payable without condition to the Village of Alsip in an amount not less than ten percent (10%) of the bid shall be submitted with each proposal, as a guarantee that, if the proposal is accepted, a contract will be entered into and the performance of the contract is properly secured.

A performance bond in a sum equal to one hundred percent (100%) of the amount of the bid, with sureties to be approved by the President and Board of Trustees for the faithful performance of the contract, must be furnished by the successful bidder. All bids or proposals shall contain an offer to furnish a bond upon acceptance of such bid or proposal.

The right is reserved to reject any or all proposals, to waive technicalities, to postpone the bid opening, or to advertise for new proposals, if in the judgment of the President and Board of Trustees their best interests will be promoted thereby.

Dated September 17, 2025

President and Board of Trustees
Village of Alsip
Cook County, Illinois

Alsip Fire Department

Specifications for a Fire Pumper

Fall 2025

Intent of Specifications

It is the intent of these specifications to cover the design, manufacture and delivery to the purchaser of a complete fire apparatus equipped as specified herein. These specifications include the general requirements of design, material content and construction as well as certain equipment that shall be provided by the contractor. Not all details of the design, material content and construction of the fire apparatus are herein specified. Any such design, material content and construction not specified herein are left to the sole discretion of the seller contractor

Payment Terms

The vendor shall supply all payment terms.

Federal & State Regulations, NFPA Standards & Import Tariffs

In the event that any applicable Federal or State Regulations (DOT, FMVSS, EPA, etc.) National Fire protection Association Standards or import tariffs which enacted during the course of this contract, and which requires a change in the contract specifications and purchase price in order for the Apparatus and Equipment to comply with such regulation, the parties will execute a change order describing the change in the specifications and increasing the purchase price by an amount equal to the increase in the cost of producing the Apparatus and Equipment.

Compliance With NFPA 1901

The National Fire Protection Association Standard "NFPA 1901 - Standard for Automotive Fire Apparatus - Current Edition" (hereinafter referred to as NPFA 1901) in effect at the time of the purchase shall be used as a reference and its requirements shall be met by the apparatus manufacturer. The apparatus shall be constructed in accordance with federal and state laws at the time of bid. Any federal, state or NFPA amended changes that shall affect the cost of producing said apparatus shall be charged to the purchaser. Mandatory minor apparatus equipment as stated in the applicable paragraphs of the NFPA standard shall not be provided unless specifically stated and listed in purchaser's written specifications.
Any and all references to "NFPA 1901" within this document shall refer to the current edition of NFPA 1901 in effect at the time of the purchase.

Purchaser's NFPA 1901 Responsibilities

In accordance with NFPA 1901, current edition, it shall be the responsibility of the purchaser to specify the following details of the apparatus:

The maximum number of firefighters to ride within the apparatus is 4.
The hose, ground ladders, or equipment to be carried by the apparatus shall be standard length and weight of the NFPA 1901 standard in effect at the time of the bid. Equipment weight and location on the apparatus are the responsibility of the purchaser as a prerequisite of defining the loaded vehicle's vertical center of gravity for rollover stability calculations, when required.

Acquaintance With Specifications

Because of the intricacies in fire apparatus design, engineering and manufacturing, the Contactor's Specifications, along with any mutually approved changes, shall prevail in the event of a discrepancy between the purchaser's original bid specifications and the contractor's specifications.

Single Source Manufacturer

The fire apparatus manufacturer shall be a single source manufacturer is defined as a manufacturer who designs, engineers and manufactures the entire apparatus in the factory of the bidder. The use of commonly incorporated components such as diesel engine, the transmission, the pump, lighting fixtures, etc. is acceptable. However, calling the cab/chassis/drivetrain or the outriggers/torque box/aerial device a "component" shall not be acceptable. Single source warranty and service provision from Seagrave Fire Apparatus, LLC and its distributors, sales representatives and service network shall be provided to ensure parts availability and undivided warranty responsibility. There shall be no exceptions to these conditions.

Discontinuation Policy

The apparatus manufacturer furnishes and installs components which are manufactured by 3rd Party Vendors. From time to time, these products are either changed or discontinued by the manufacturer. The apparatus manufacturer shall replace a discontinued 3rd Party Vendor manufactured component with an equivalent model as approved by the Alsip Fire Department.

Completion Date

Barring any significant change in any current backlog of orders, and delays due to strikes, war or international conflict, failures to obtain materials, or other causes beyond the control not preventing, the apparatus and equipment detailed in the attached specification shall be delivered to the Alsip Fire Department specified in an approximation date at the time of bid submittal

A more specific date shall be determined during the pre-construction meeting. Any changes or delays that don't meet the requirements stated above shall result in a penalty to the builder of $1000 per day of delay.

Proposal Drawings

Included with our proposal are line drawings of the apparatus being proposed. These drawings shall be drawn to scale on a CAD system to assure an accurate and professional drawing. The drawings show five
(5) views of the vehicle: front, rear, both sides and top. The drawings show the wheelbase and overall dimensions of the apparatus, proposed compartment sizes and features, booster tank position and the location of all emergency warning equipment, work lights, seating and other major items that are to be provided by the apparatus.

Bid Bond

A certified check/bank draft drawn on a solvent bank, cashier's check or bid bond, payable without condition to the Village of Alsip in an amount not less than ten percent (10%) of the bid shall be submitted with each proposal, as a guarantee that, if the proposal is accepted, a contract will be entered into and the performance of the contract is properly secured.

Performance Bond

A performance bond in a sum equal to one hundred percent (100%) of the amount of the bid, with sureties to be approved by the President and Board of Trustees for the faithful performance of the contract, must be furnished by the successful bidder. All bids or proposals shall contain an offer to furnish a bond upon acceptance of such bid or proposal.

Approval Drawings

Following the acceptance of a complete and approved order, three (3) sets of engineering, blueprint type drawings, specifically for this apparatus, shall be provided by the manufacturer and shall be approved by the Alsip Fire Department before construction begins. Both the Alsip Fire Department and the manufacturer's representative shall have a copy of this drawing. It shall become part of the total contract. These drawings shall be drawn to scale on a CAD system to assure an accurate and professional drawing. The drawing shall show five (5) views of the vehicle (front, rear, both sides and top). The drawings shall show the wheelbase and overall dimensions of the apparatus, final compartment sizes and features, booster tank position, the location of all emergency warning equipment, work and scene lights.

Change Orders

To ensure the proper engineering and construction of the purchaser's custom fire apparatus in a timely manner, the contractor shall consider the order final and complete at placement of the order. Change orders requested after the order placement are discouraged. It shall be understood and agreed that any changes, if approved, after the order has been released to Engineering, shall constitute a valid cause for production delay and without penalty to the contractor.

Pre-Construction Conference

A "Pre-Construction" conference trip for representatives of the purchaser shall be included in the bid. The conference shall be held at a company facility or an authorized representative's facility during normal business hours, Monday - Friday. All cost of transportation, meals and lodging shall be the responsibility of the purchaser if the travel is less than 350 miles driving miles from Alsip Fire Station #1. Any distance greater than 350 driving miles, all travel and lodging shall be the responsibility of the vendor. A distributor or sales representative shall accompany the purchaser on the trip. The conference shall be held prior to the commencement of any work being done on the apparatus. Factory sales and engineering personnel shall participate in the conference as needed to ensure that the apparatus fulfills all the requirements of the accepted bid. Authorized representatives from both the purchaser and manufacturer shall approve and sign any changes made during these meetings prior to the commencement of any work being done on the apparatus.

Up to five (5) representatives may attend the pre-construction conference.

Midpoint inspection

A "mid-point" inspection trip for representatives of the purchaser shall be included in the bid. The inspection shall take place at a Company facility during normal business hours, Monday - Friday. All cost of transportation, meals and lodging shall be the responsibility of the purchaser if the travel is less than 350 miles driving miles from Alsip Fire Station #1. Any distance greater than 350 driving miles, all travel and lodging shall be the responsibility of the vendor. The selection of the inspection location shall be done at the sole discretion of the Company. An authorized distributor or manufacturer's sales representative may accompany the Purchaser on the inspection trip.

Up to five (5) representatives may attend the final inspection trip.

Final Inspection Trip.

A "Final" inspection trip for representatives of the purchaser shall be included in the bid. The inspection shall take place at a Company facility or an authorized representative's facility of the Company's during normal business hours, Monday - Friday. All cost of transportation, meals and lodging shall be the responsibility of the purchaser if the travel is less than

350 miles driving miles from Alsip Fire Station #1. Any distance greater than 350 driving miles, all travel and lodging shall be the responsibility of the vendor. The selection of the inspection location shall be done at the sole discretion of the Company. An authorized distributor or manufacturer's sales representative may accompany the Purchaser on the inspection trip.

Up to five (5) representatives may attend the final inspection trip.

Pre-Delivery Road Trip And Final Factory Checklist

Prior to delivery, the completed apparatus shall be thoroughly inspected by the factory. This inspection shall include a road test of the apparatus. During the factory inspections and road testing, a checklist shall be utilized by factory personnel to document the inspection and road test results. The checklist shall include:

Documentation of the make, model and serial numbers of all major components such as the engine, transmission, pump, axles, etc.
Complete, comprehensive operational check of all chassis/drive train components and fluid levels.
A comprehensive review of the entire exterior and interior of the apparatus for fit and finish, checked against the customer's order specifications, and any ensuing change orders.
A thorough test of all driving systems under actual highway and city driving conditions.

Delivery

The fire apparatus shall be delivered over the road and under its own power to ensure proper break-in of all driving components while still under warranty. Rail or truck freight shipment of the apparatus is not acceptable.

Familiarization

An experienced and qualified distributor or factory representative shall familiarize Fire Department personnel (as designated by the authority in charge) in the proper operation, care and maintenance of the apparatus delivered.

The representative must be a qualified, trained agent of the local authorized distributor, or a direct employee of the manufacturer of the apparatus.

The familiarization period shall consist of six (6) sessions over a period of three (3) consecutive days, during the normal work week (Monday - Friday). The schedule of the instruction sessions shall be arranged by mutual agreement of the Fire Department and the delivering authority. The number, length and time of the sessions may vary due to the nature of the apparatus and availability of attendees and must be approved in advance. The balance of any time remaining in a session may be devoted to minor adjustments or corrections to the apparatus for items which may have developed while in transit from the factory.

General Design Requirements

The specified apparatus shall be a custom cab type (medium in size); designed, engineered and manufactured specifically for the fire service in North America. The apparatus meets or exceeds the requirements of the NFPA 1901, the current edition, in all respects.

The custom cab chassis shall be provided. It incorporates all construction materials for durability and safety. The cab shall incorporate a protective safety-cage design that totally surrounds and protects the seat belted driver, officer and crew. All structural materials used in the construction of the cab chassis must be specified in the bid.

The Cab and Body shall be constructed with extruded type of construction, not formed. Any bid that specifies a formed type of construction will be denied.

Gross Vehicle Weight- With Certificate At Delivery

The manufacturer shall be responsible for proper weight distribution upon the chassis and axles.
The apparatus, when loaded, shall have not less than 25% nor more than 45% of the weight on the front axle and not less than 55% nor more than 75% on the rear axle. A certified weight certificate showing weights on the front axle, rear axle and total weight for the completed apparatus with the water and fuel tanks full, but without personnel, equipment and hose shall be provided at the time of delivery.

In accordance with NFPA 1901, the Alsip Fire Department shall notify the manufacturer in the purchaser's specification of any hose, ground ladders, or equipment to be carried by the apparatus that exceeds the minimum requirements of the NFPA 1901 standard in effect at the time of the bid. **The Alsip Fire Does not does not exceed the NFPA 1901 standard for specification of hose, ladders or equipment.**

General Construction, Quality and Workmanship

The design and construction of the apparatus shall embody standard automotive heavy vehicle engineering practices. The apparatus shall be designed, engineered and constructed with due consideration for the severe service nature of the fire service. All parts of the apparatus shall be installed in accordance with the OEM specifications.

Distribution of load between the front and rear axles shall be engineered so that all specified equipment, including a filled water tank, full complement of personnel and fire hose shall be carried without damage to the apparatus. Weight balance and distribution shall be in accordance with the recommendations of the National Fire Protection Association and current standard automotive practices.

All welding personnel that shall be utilized in the fabrication and construction of structural components of the apparatus chassis, body and aerial device shall hold a valid certificate from the AWS - American Welding Society.

The apparatus shall be designed to conform to applicable ANSI and NFPA 1901 standards. The following design criteria shall be applicable to this specification to the extent specified herein:

- American Society for Testing Materials (ASTM) - A-36, Specification for Structural Steel
- Society of Automotive Engineers, Inc. (SAE) - SAE Handbook
- American Welding Society (AWS) - AWSO14.4-77 Classification and Application of Welded Joints for Machinery and equipment.
- American Society for Non-Destructive Testing (ASNT)

All sensitive components shall be protected against adverse weather conditions. Any exposed metal surface which is not painted or otherwise coated shall have a bright finish. Corrosion protection shall be provided between any dissimilar metals joined in the construction of this apparatus.

General

Chassis shall be a new, heavy-duty, custom fire apparatus design built expressly for the fire service. All standard components that have not been specified shall be provided.
Chassis shall be designed, engineered and built by the bidder and be the manufacturer's first line custom chassis.

The chassis shall be suitable for heavy duty service with all components having adequate strength and capacity for the intended load to be sustained and the type of service required.

NFPA 1901 Stepping Surface Certification

A certification that all materials used for exterior surfaces designated as stepping, standing and walking areas, all interior steps and all interior floors meet the slip resistance requirements of the applicable edition and section of NFPA 1901 shall be provided with the delivery documentation.

Pump Test and Certification

The fire pump shall be third party tested at the apparatus manufacturer's facility and shall conform to NFPA requirements and standards. Copies of all tests and the manufacturer's record of pump construction details shall be provided with the delivery documents.

Wheelbase

The wheelbase shall be: 183.50 inches or close comparable.

Seating Capacity

The safe seating capacity of the cab for properly belted passengers shall be: Four (4)

Approach - Departure Angles

An angle of approach and an angle of departure of at least 8 degrees shall be maintained at the front and the rear of the vehicle when it is loaded to the estimated in-service weight, as defined by NFPA 1901 current edition

Gross Vehicle Weight Ratings

Front Vehicle Weight Rating shall be: [#20,000]

Rear Vehicle Weight Rating shall be: [#27,000]

Gross Vehicle Weight Rating shall be: [#47,000]

Bumper- 10.25" High (NYC Style), Mitered Corners, Painted

A heavy duty 10-1/4" high x 1/4" thick painted steel bumper shall be mounted to the front of the chassis and be fabricated in the factory of the bidder. The bumper shall be channel shaped with 2" flanges and its ends shall be angled 45 degrees for a distance of 5". The bumper shall be painted to match the lower cab color.
As part of the bumper extension, a second formed channel with 2" flanges shall be provided directly behind the full width of the flat portion of the bumper. The bumper extension support shall be of channel (minimum 9-7/16" x 3" x 3/8") construction, bolted to the chassis frame stub. A 3/16" aluminum tread plate gravel pan (deck) contoured to fit just below the front face of the cab and just below the upper bumper flange shall be provided. The gravel pan shall not be fastened to the top flange of the bumper.

Bumper Mounting Bolts

The visible mounting bolts for the bumper shall be black carbon steel.

Line-X® Edge

Black LINE-X® coating shall be applied to the top flange of the bumper and shall terminate 1" down on the front and

sides of the extension.

24" Bumper Extension

A bumper extension shall be installed at the front of the cab. The front of the bumper shall be approximately 24" from the front face of the cab. A gravel pan made of 3/16" aluminum tread plate shall be installed between the front bumper and the cab. The bumper extension shall be designed and constructed so that the apparatus can be pulled by the extension.

Liftable And Towable Bumper Extension

The bumper extension shall be designed and constructed so that the apparatus can be lifted and towed by the extension.

Front Bumper Trough - Center

A bumper trough shall be installed in the center of the bumper extension. It shall have interior dimensions of 17.75" wide x 27.25" long x 13" deep. It shall be constructed of smooth aluminum and be easily removable from the gravel pan. Drain holes shall be provided.

If a front hitch/receiver point is present, the trough interior dimension shall be: 17.75" wide x 25.25" long x 13" deep.

Dri-Dek® - Front Bumper Compartment (Ea)

Black Dri-Dek® shall be provided in the bottom of each front bumper compartment(s). Ramped edging shall not be included

Velcro Retaining Straps

A two-piece black polypropylene Velcro retaining strap shall be provided for each hose well. It shall be permanently attached to the gravel pan on the front and rear of the trough and shall secure in the center. Looped ends of the strap shall be secured to the apparatus with footman's loops.

Front Bumper Trough - Right

A bumper trough shall be installed on the right side of the bumper extension. It shall have interior dimensions of 15.25" wide x 16.25" long x 13" deep. It shall be constructed of smooth aluminum and be easily removable from the gravel pan. Drain holes shall be provided.

Fama26 No-Step Sign

In accordance with NFPA 1901 chapter 15.7.1.6, a FAMA26 "No-Step" sign shall be attached to the top of the gravel pan. The sign reads: "Fall Hazard Railings NOT provided. Surface may be slippery - Not intended for stepping, standing or walking. Fall will injure or kill".

Front Tow Hooks

Two (2) painted tow hooks shall be furnished below the bumper securely attached to the bumper support. They shall be painted to match the frame/undercarriage.

Rear Tow Loops

Two (2) painted rear tow loops shall be provided, welded to the underside of the rear step subframe. The loops shall be rated at 9000 pounds straight pull. They shall be painted to match the frame/undercarriage.

Power Steering Installation

A heavy-duty power steering system shall be provided. The hydraulic pump shall be engine gear driven.

Auxiliary Cylinder For Power Steering

An auxiliary power assist cylinder shall be provided in the power steering system.

Chassis Alignment

The chassis frame rails shall be cross checked for length and square. Front and rear axles shall be laser aligned. The front axle shall be aligned at the manufacturer's facility.

Air Piping

The service brake system shall be full air type. The system is to meet or exceed current FMVSS-121 requirements. Other components or accessories shall be as follows:

- Pressure protection valve
- Quick build up system
- Engine mounted, gear driven air compressor
- Bendix Model E-6 dual circuit brake treadle valve
- Two (2) air pressure gauges on cab dash with indicator light and buzzer
- Air reservoirs with capacity to meet FMVSS-121

The Bendix valve or equivalent, in conjunction with the double check valve, shall enable modulation of the spring brakes in the event of a service brake air system failure to allow the vehicle to be stopped.
Brake piping shall consist of SAE approved, DOT rated "Synflex" reinforced colored nylon tubing. The lines shall be wrapped in a heat protective loom where necessary in the chassis. Braided hoses shall provide flexibility between axle and frame connections. Brake air lines shall be color-coded. Air inlet to air brake compressor shall be from the engine intake manifold, i.e. after transition through the engine air cleaner. A flexible stainless steel braided Teflon hose and/or copper tubing shall be provided from the compressor to the air dryer. Fittings shall be brass.

The parking brake system is to be the spring set type operated by control valve on driver's console. A brake indicator light shall also be provided.

Main Air System Drain(S)

Bendix heated automatic DV2 moisture ejector(s) shall be provided on the main air system reservoirs.

Wet Tank

A 1250 cubic inch wet air tank shall be provided with the air system.

Wet Air Reservoir Drain Control

A cable-controlled drain valve and Bendix DV2 automatic heated moisture ejector shall be provided on the wet tank. The pull cable shall be extended to the side of the truck with a loop provided at its end. It shall be labeled: Drain Daily.

Additional Air Reservoir

One (1) additional 1770 cubic inch air reservoir(s) shall be provided and installed. Each extra reservoir shall be isolated and be plumbed with an 85 PSI pressure protection valve on the reservoir supply side.

Isolated Air Tank Drain(s) - Bendix #DV2, Moisture Ejector, Heated (Ea)

Bendix heated automatic DV2 moisture ejector(s) shall be provided on the one (1) isolated air reservoirs.

Air Reservoir Tank Shall Be Used For Air Horn

Air reservoir tank shall be used for air horn.

Air Dryer - Bendix

A Bendix air dryer shall be installed in the air brake system. It shall be equipped with an automatic heated moisture ejector.

Disc Brakes

The front axle shall be provided with air disc brakes with internal automatic adjustment, sealed synchronized twin pistons and robust sealing of slide pins for environmental protection. The air disc brakes shall have a fully sealed lever mechanism with variable mechanical ratio. A visual indicator of brake wear shall also be provided.

Front Semi-Elliptical Spring Suspension

The front suspension shall be semi-elliptical constant rate type springs with a military wrapped eye. The correct material, spring length, width, thickness and number shall be provided to match the leaf spring rating with that of the gross axle weight rating of the vehicle.

Rear Axle - RS-25-160, With EX225H Disc Brakes, 27,000#

The rear axle shall have a capacity of 27,000 pounds at the hub. The rear axle shall be provided with air disc brakes with internal automatic adjustment, sealed synchronized twin pistons and robust sealing of slide pins for environmental protection. The #EX225H air disc brakes shall be fully sealed lever mechanism with variable mechanical seal. A visual indicator of brake wear shall also be provided.

Vehicle Performance Analysis Report - Provided When Done

A performance analysis report shall be run on the vehicle, as ordered, using computer software to determine top speed, gradeability, optimum shift points and acceleration on various grades. The report shall be delivered with the completed vehicle.

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Top Road Speed 68 MPH

The top road speed of the vehicle shall be 68 MPH.

ANTI-LOCK BRAKING SYSTEM (ABS)

The vehicle shall be equipped with a WABCO 4S4M anti-lock braking system (ABS). The ABS shall provide four (4) channel anti-lock-up braking control on the (2) front and (2) rear wheels. The system shall employ a digital electronics system with microprocessor controls divided into two (2) diagonal circuits. In the event of one circuit malfunction the second circuit shall operate unaffected. Each wheel shall be constantly monitored by the system when the vehicle is in motion. When any wheel begins to lock up during braking, a signal shall be transmitted to the processor from the wheel sensor. The control unit shall instantly reduce the braking force applied to the wheel and immediately re-apply braking force so that the wheel rapidly slows without locking. The system shall control all wheels simultaneously to provide maximum vehicle braking in a relatively straight line.

An ABS warning light shall be installed in the warning light panel of the driver's dash.

The ABS system shall automatically disengage the auxiliary braking system whenever the anti-lock braking mode is active.

Warranty- Anti-lock Braking System

A three (3) year or 300,000 miles parts and labor warranty shall be provided by Meritor WABCO Vehicle Control Systems for the Anti-Lock Braking System (ABS).

Warranty - Disc Brakes

Corporation provides three (3) year parts and labor warranty on the EX225H disc brakes.

Warranty- Rear Axle

Corporation provides two (2) year parts and labor warranty on the rear axle.

Vehicle Stability Compliance – Electronic Control

In compliance with NFPA 1901, current edition standard 4.13.1, the vehicle, as specified, shall be equipped with a Meritor-WABCO electronic Roll Stability Control system that shall utilize a centrally mounted pitch and yaw sensor and steering shaft position sensor interacting with the chassis' ABS traction control, auxiliary braking system and the engine ECM to minimize the vehicle's potential for rollover in a turning at speed maneuver.

Vehicle Stability Compliance – Electronic Control

In compliance with NFPA 1901, current edition standard 4.13.1, the vehicle, as specified, shall be equipped with an electronic Roll Stability Control system that shall utilize a centrally mounted pitch and yaw sensor and steering shaft position sensor interacting with the chassis' ABS traction control, auxiliary braking system and the engine ECM to minimize the vehicle's potential for rollover in a turning at speed maneuver.

Automatic Traction Control With Deep Snow And Mud Switch

Automatic Traction Control, working in concert with the ABS system, shall be provided which shall reduce wheel slip on acceleration on wet or slippery road conditions. A light shall illuminate on the driver's dash when the drive wheels slip during acceleration.

A deep snow and mud option switch shall be provided in addition to the ATC option. This function increases available traction on extra soft surfaces like snow, mud or gravel by slightly increasing the permissible wheel spin.

Auto Lube System - (Single Axle

An automatic lubrication system shall provide automatic grease applications on the unit, with the recommended dosages, per system interval cycle.

The auto lube system shall be powered by an electrically driven gear pump. The gear pump shall be top mounted to a reservoir assembly with a capacity of 2.7 liters. The pump shall operate against a back pressure of 38 BAR (550 PSI) nominal, with an output of 160 cc/min. The pump assembly shall be mounted in a suitable location to facilitate care and maintenance of the system by removal of the cover assembly for access to the refill valve connection for replenishment of the grease reservoir.

Distribution of lubricant shall be via piston distributors utilizing the “post lubrication principle”, dispensing lubricant on the off cycle of the system or pump run time, with metering nipples bearing dosage identification which can be field changeable without disruption of other lubrication point connections.

The auto lube system shall be operated via an electronic control module with system monitoring capabilities of the main line and operating cycle with dash mounted visual indication to the vehicle operator. The control module shall have LED's and a system reset button to initiate a lube cycle for diagnostic purposes and/or reset the control module in the event a system fault has occurred. Upon a fault, the system is inoperable until the fault has been corrected and a system reset has been initiated by the operator or serviceman.

On the front axle, the following items shall be lubricated, as standard: drag link, tie rod, spring and shackle pins and the steering assist cylinder. The following items shall also be lubricated, if present:
s-cam brakes and slack adjusters. The kingpins shall be lubricated, as standard, only if on a Meritor axle; kingpin lubrication on a Dana axle voids the warranty.

On the rear axle, if present, the following items shall be lubricated: s-cam brakes and semi-elliptical spring suspension.

35 Lb. Tub Of Grease For Lube System

A 35# tub of grease, (5-gallons), shall be provided

Auto Lube System Reservoir Location - Behind The Master Gauge Panel

The auto lube system reservoir shall be located behind the master gauge panel.

Rear Semi-Elliptical Spring Suspension, Single - 27,000#

The rear suspension shall be semi-elliptical 3" x 52" constant rate type springs with a military wrapped eye. The correct material, spring length, width, thickness and number shall be provided to match the leaf spring rating with that of the gross axle weight rating of the vehicle.

Front Tires

The two (2) front tires shall be specified with on/off road tread (heavy loads and slower speeds, operating on a mixture of improved secondary and aggressive road surface). This tire shall a nominal rating of 10,000 pounds with a top speed of 65 mph and an intermittent fire service rating of 10,000 pounds at a top speed of 75 mph.

Rear Tires

The four (4) rear tires shall be load range "H", (all-weather premium drive tire optimized for exceptional traction and mileage). This tire has a nominal rating of 6,780 pounds with a top speed of 75 mph and an intermittent fire service rating of 7,255 pounds at a top speed of 75 mph.

Wheels

All Wheels shall be painted in black matte

Front Axle "Baby Moon" Hub Caps

Stainless steel "Baby Moon" type hub caps shall be provided on the front axle.

Tire Pressure Indicators

Tires shall have non-pressure indicators installed for shipment.
Accu-Pressure Heavy Duty Safety Caps shall be provided and shipped loose. This valve stem inflation pressure sensitive monitor shall provide a visual color indication of when the tire pressure is below the manufacturers recommended level. The chrome safety cap shall show green when the tire is properly inflated and red once the tire becomes under inflated. All inner wheels shall be equipped with a valve stem extension that shall allow the inner wheel to be filled without removing the outer wheel.

Tire Balance

EQUAL Tire Performance Balancing Compound shall be inserted into the front tires to balance and maintain a vibration-free rotation.

Engine - Cummins, For Single Axle, EPA21/OBD21 Certified

The chassis shall be powered by an EPA21/OBD21 certified and compliant Cummins L9-450 diesel engine as described below:

· Models	specified
· Number of Cylinders	Six
· Bore and Stroke	specified
· Displacement Liter (Cu. In.)	specified
· Rated BHP	specified
· Torque	specified
· Governed RPM	specified
· Oil Capacity / Type	specified
· Fuel Requirement	Ultra Low sulfur diesel (15 ppm max.)

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Standard equipment on the engine shall include the following:

- Selective Catalytic Reduction (SCR) after treatment
- Cooled Exhaust Gas Recirculation syste
- Charge air cooling
- High pressure, common rail fuel system
- Fuel filter with check valve and water separator
- Fuel strainer
- Governor – electronic, interact system
- Injectors – electronically controlled full authority injection
- Lube oil cooler – integral
- Lube oil filter – full flow
- Turbocharger – variable geometry type
- Air compressor – specified

The engine exhaust system shall be a horizontal design constructed from heavy-duty truck components. Flexible couplings shall be utilized to absorb the torque and vibration of the engine. The outlet shall be directed to the forward side of the rear wheels, exiting the right side, with a straight tip. A
heat-absorbing sleeve shall be used on the exhaust pipe in the engine compartment area to reduce stored heat, providing protection for the alternator, and also to protect hands when checking or adding oil in the engine compartment.

Engine And Charged Air Cooling Systems

A serpentine core type radiator with continuous louvered copper fin design shall be provided. The radiator shall be fitted with formed steel side frames. The top tank shall have a built-in de-aeration system. A drain shall be located at the lowest point.

The engine charged air heat exchanger shall be located directly in front of the radiator and be bolted to its side rails. It shall be all aluminum-brazed construction. Air cooler shall be the cross flow design with cast aluminum side tanks, horizontal inlet and outlet at top and louvered serpentine design, aluminum external air fins. Plastic tanks shall not be acceptable, no exceptions. Cooler tubes shall also be constructed of aluminum and shall have internal fins that eliminate laminar air flow.

The charge air cooler and the radiator shall be produced by the same manufacturer as a single assembly
to provide continuity throughout the cooling system. This shall ensure a certified “balanced” package for the chassis engine air and fluid cooling systems
.
The radiator charge cooler shall be mounted to the chassis front frame stub and the fabricated mounting brackets for the fan ring shall be attached to the front of the engine in a manner so that it “floats” with the engine and increases the fan’s efficiency by minimizing the fan tip clearance while preventing torque contact between fan and ring. This mounting design eliminates engine fan and radiator shroud contact due to engine torque movement and promotes more efficient airflow. The radiator / charge air cooler package shall be held in place at the bottom by two (2) large bolts equipped with anti-stress rubber biscuits. The top of the radiator shall be supported by two (2), ¾” tubular braces, bolted to the front frame stub. Anti-vibration rubber biscuits shall be installed at the top threaded end of the braces where they attach to the radiator.

Engine Cooling Certification

"EPQ" (End Product Questionnaire) certification shall be provided by the chassis manufacturer. Certification shall be documented with reference to each specific chassis model by the chassis manufacturer.

Fan Clutch

A viscous style thermostatically controlled, clutch shall be provided for the engine cooling fan. The clutch shall be of a failsafe design, in that it shall fail in the "on" mode and thus prevent overheating. Manufacturers shall also wire the clutch so that it remains "on" in the pumping mode to prevent water pressure fluctuations.

Transmission

An Allison electronically controlled automatic transmission with integral fluid filter shall be provided. A transmission cooler shall be installed in the radiator bottom tank. A warning light and buzzer shall be provided on the cab dash to alert the driver should the transmission overheat.

The transmission shall include the following: an oil life monitor, a filter life monitor, and a transmission health monitor. The oil life monitor determines fluid life remaining by monitoring various operating parameters. The filter life monitor determines when fluid filter(s) need to be replaced. The transmission health monitor determines when clutch system inspection is required. The monitors send a message via a blink code to a special prognostic light on the shift pad. Also on the shift pad a digital, double-digit display shall be installed that identifies the level of transmission oil. The display shall identify the oil level as "Ok", "Lo" or "Hi", also indicating the number of quarts lo or hi.

The transmission shall include the following emergency vehicle specifications:

- Maximum gross input power: specified
- Maximum gross input torque: specified
- Input speed range: specified
- Direct gear lock-up: specified
- Overdrive gear and ratio:

- Gear ratios shall be as follows:

The transmission shall automatically shift into neutral whenever the chassis parking brake is applied.

Transmission Fluid

The Allison transmission shall be delivered from the factory with synthetic SAE standard ATF.

Transmission Programming

The transmission shall be programmed as a 5-speed with 5th gear (overdrive) selected by mode button only.

Touch Pad Transmission Control

Touch pad control shift module shall be mounted to the right of the driver on the console and be indirect lighted for after dark operation.

Warranty

Allison provides a 5 year warranty on the transmissions. See warranty certificate for complete details.

Driveline

Drivelines shall be built with heavy-duty metal tubes and utilize Spicer 1710 series or "Equal" mechanics type universal joints with "half round" end yokes. This quick disconnect strap and bolt design type end joint shall allow the driveline to be easily disassembled and dropped straight down for ease of service
and maintenance. They also shall be dynamically balanced by the truck manufacturer before installation in the chassis. A splined slip joint shall be provided in each shaft assembly. A grease zirk shall be provided for lubrication of the slip joint.

Fuel Water Separator With Alarm

A 8-micron filter with fuel water separator and water sensor alarm shall be mounted in a serviceable and accessible location, that the cab may need to be tilted for.

Engine Starter

A 12-volt, 5.0 kW gear reduction starter shall be installed.

Air Compressor

A Wabco 18.7 cfm air compressor shall be furnished. The air compressor shall be gear driven off the engine.

Engine Brake

A Jacobs engine brake shall be installed with controls within easy reach of the driver. The brake shall automatically be actuated when the accelerator pedal is released and shall be wired in conjunction with the rear brake lights so that they are activated when the engine brake is engaged. It shall have a
two-position switch; "Low" and "High" in addition to a manual "On/Off" switch.

Warranty

Cummins provides a 5-year or 100,000-mile warranty on the engine. See Cummins Warranty Certificate for complete details of terms, conditions and deductibles.

Fuel System

The vehicle shall be furnished with a 65-gallon fuel tank mounted behind the rear axle and just below the frame rails using a stainless-steel strap. The tank shall be constructed of stainless steel and equipped with a swash partition and vent. The fuel tank shall meet all FHWA requirements including a fill capacity of 95% of tank volume and all DOT and FMVSS regulations for rollover protection. A 2" diameter fill inlet shall be provided. Fuel cap shall be of brass or bronze construction, non-vented and have lead safety fuses. It shall be chained to inlet tube or to the body sheet metal to prevent loss.
Braided hoses shall be provided for the fuel lines. A 1/2" NPT drain plug shall be located at the bottom of the tank. The tank shall be installed using stainless steel straps and hardware, separated from the tank by a rubber insulating strip to prevent against chaffing.

The stainless-steel fuel fill inlet shall be located on the left (drivers) side of the apparatus. It shall be concealed behind the door. The inside of the door shall be marked "ULTRA LOW SULFUR DIESEL FUEL ONLY". The fuel inlet area, recessed behind the door, shall be completely enclosed to prevent
dirt and debris from entering. Provision shall be provided inside the fill recess for drainage of any spilled fuel within the cavity.

Fuel Fill Door - S/S, Brushed, Side Hinged (Na Tda)

The fuel door shall be constructed of stainless steel and shall have a brushed finish. It shall be hinged along the vertical side towards the front. A magnet shall hold the door in the closed position. The door shall be kinked along 3 edges with the fourth side being used as s finger grab for opening and closing it. A stainless-steel trim ring shall encircle the opening to prevent the fuel nozzle from damaging the surrounding surface when it is opened. The fuel shelf shall be made from a high impact polyethylene material.

DPF Regeneration Process

NFPA 12.2.6.7.1 The regeneration process shall be activated by two methods:

Automatically by the engine system but only when the transmission is in gear and the speedometer indicates a speed above 5 mph (8km/hr) whether the apparatus is in motion or is operating in stationary pump mode with an engine rpm sufficient to register 5 mph (8 km/hr) on the speedometer.
Manually when initiated by activation of a switch located in the driver's area of the driving compartment.
There shall also be an inhibit switch placed near the driver to inhibit an automatic reburn.

Def

The urea mixture, a solution of 2/3 water and 1/3 urea which reacts with NOx to create nitrogen and water, shall be stored in a Standard tank equipped with a level sensor and alarm to prevent run-out.

Def Access

The DEF shall be filled directly by having an access door just inside the driver’s side rear door that leads to the fill tube.

Exhaust Heat Shields

Heat shields shall be provided as needed to prevent damage to body and wiring from excessive exhaust temperatures. The exhaust pipe shall be wrapped in multi-layered insulation blankets., from just aft of the turbo down to inlet side of the DPF. Each blanket shall have a fiberglass inner layer and a silicone impregnated fiberglass cloth outer layer.

Fast Idle Switch

A fast idle switch shall activate an engine high idle. The circuit shall be wired through the neutral safety/parking brake interlock to prevent activation when the transmission is in road mode. Fast idle shall be set at 1000 RPM's. A switch located inside the cab convenient to the driver shall be provided for this system.

Lubrication Nameplate

A nameplate shall be installed that specifies the quantity and type of the following fluids used in the vehicle and tire information:

- Engine oil
- Engine coolant
- Chassis transmission fluid
- Pump transmission lubrication fluid

- Pump priming system fluid, if applicable
- Drive axle(s) lubrication fluid
- Air condition refrigerant
- Air conditioning lubrication fluid
- Power steering fluid
- Cab tilt mechanism fluid
- Transfer case fluid
- Fuel
- Diesel Exhaust Fluid
- Windshield Washer Fluid
- Auto Lubrication System lubricant, if applicable
- Equipment rack fluid, if applicable

- Foam system lubricant, if applicable
- Generator system lubricant, if applicable
- Aerial Hydraulic Fluid, if applicable
- Front tire size and cold pressure
- Inter tire size and cold pressure, if applicable
- Rear tire size and cold pressure
- Trailer tire size and cold pressure, if applicable
- Maximum tire speed ratings
- Ambient operating temperature
- Paint colors and codes

A layer of Velvet Polycarbonate shall overlay the lettering to protect it. The lubrication nameplate shall be installed on the interior face of the driver's door, near the hinge and below the window controls

Full Tilting Cab

The cab shall be designed specifically for the fire service and shall provide roll cage strength and safety.
The cab shall be made in the factory of the bidder and must utilize the bidder's
top-of-the-line technology and manufacturing techniques. The entire cab shall tilt forward 45 degrees for engine access. No plastic, fiberglass, or aluminum shall be used in the construction of the cab sub-frame, floor assembly, front assembly, side assemblies, back wall assemblies or roof assembly.

Cab Dimensions

The cab shall be designed and constructed shall be considered a “Medium” sized 4- door cab. The back wall of the 131" cab shall measure 62" from the center of the front axle. The cab shall have an inside width of 91" and outside width of 96". Close exceptions will be accepted.

Custom Cab Design and Construction

Cab Floors

All floor components shall be welded directly to the sub-frame. The floor shall be constructed of 50,000 psi stainless steel.

CAB DOOR CONSTRUCTION - BARRIER CLEARING

The four (4) cab doors shall be barrier clearing and fabricated from specified materials by the manufacturer. The cab doors shall be 34.75" wide. The interior and exterior door handles to be flush mounted paddle style with a keyed lock

incorporated in the exterior handle and lever control lock incorporated in the interior handle. One (1) key per door shall be provided. Six (6) inch wide strap style door checks shall be provided. The door check's straps shall have a tensile strength of 120 lbs/in of width. The door's latch locking mechanism shall make it impossible to lock oneself out of the cab unless locked with the supplied key. Doors shall meet Federal Motor Vehicle Safety Standard #206. The doors shall be designed so as to allow the windows to roll completely down.

Entrance step wells to the driver's and officer's positions shall be a minimum of 26" wide and the rear crew step wells shall be 26" wide. They shall be "spaced" from the step well walls at front, rear and side to prevent trapping of dirt and other residue. Entrance steps shall be made of expanded grating.

Front Door Opening- Approximately 75 degrees

The front cab doors shall open at approximately 75 degrees.

Rear Crew Door Opening- Approximately 90 degrees

The rear crew cab doors shall open approximately 90 degrees.

Inner Door Panels – Dark Gray Line-X® (4)

The upper inside bolt-on panel on each cab door shall be removable and shall be constructed of aluminum covered with dark gray LINE-X®.

Chevron Striping

The lower one-half of the door panels shall be covered with red and yellow Chevron striping.

Entire Cab Floor

The entire cab floor shall be covered with a mat that functions as a sound dampening barrier. The mat shall have a pebble textured heavy-duty wear surface and be laminated to a foam underlay. The mat shall be composed of a vinyl-nitrile blend, which is the base material used in IV tubes and blood bags; it is not affected by blood or other body fluids.

Atp Overlay On Back Of Cab

An aluminum tread plate overlay shall be provided on the exterior rear wall of the cab. Strips of aluminum tread plate shall cover the full height of the rear wall of the cab, and shall run from the outside edge of each side of the cab, in towards the center approximately one-quarter of the width of the cab. If an optional window is provided on the rear wall of the cab, it shall be fully surrounded by the aluminum tread plate.

Cab Grille - Vertical Bars And Raised Bezel Surround

The cab front opening shall be covered with a custom made polished stainless steel grille that shall be fabricated in the bidder's factory. The grille shall have formed vertical bars spaced apart on 2" centers. The upper polished stainless steel grille shall have a matching lower counterpart to further facilitate engine cooling. The two (2) stainless grilles shall be housed in a custom, raised and chrome plated bezel.

Upper Raised Bezel Surrounds, With Panels

A custom raised and chrome plated bezel shall be installed on the front face of the cab, on each side of the front grille. Housed within each bezel shall be a removable panel, painted job color. The removable panel shall provide service access

to the forward side, firewall mounted electrical connections and wiring harness.

Engine Air Intake Grille With Water/Ember Separator

The air intake shall be concealed behind the cab grille. The water and ember separator shall set behind the cab grille on the officer's side. This may be cleaned or replaced by tilting the cab.

10" Raised Roof

The rear section of the cab roof, over the crew cab area, shall be raised 10" higher than the driver's and officer's section. The raised portion shall start just behind the centerline of the front axle. The leading forward face of the raised roof shall slope backward 45 degrees to provide a streamlined look.

The interior floor to ceiling height of the forward portion of the cab shall be 57". The interior floor to ceiling height of the rear crew portion of the cab shall be 67".

The rear crew cab doors shall be extended into the raised portion to provide maximum headroom for entering and exiting the rear crew cab. The top of the rear crew doors shall increase by 10" and have an additional piece of fixed glass at the top of the door, above and separate from the standard door glass.

Door Window Trim

Flat black trim shall separate the roll-down glass of the crew doors and the fixed glass above it.

Painted Cab Roof

The exterior surface of the cab roof shall be painted in compliance with the cab paint specifications detailed elsewhere in this specification document.

Front Intermediate Cab Steps

Two (2) stationary steps shall be provided, one at each front cab door. The steps shall be approximately 12.0" long, have a 9.0" radius, and be located to the front of each cab step well. The steps shall be constructed of aluminum grating.

Rear Crew Intermediate Cab Steps

Two (2) stationary steps shall be provided, one at each rear crew cab door. The steps shall be the full width of the cab step well. The steps shall be constructed of aluminum grating.

Cab Side Access Door

Two (2) cab side access doors shall be provided on the cab, one on each side between the front doors and front crew cab windows. Door openings shall be approximately 13.00" wide x 25.00" high. The doors shall open a minimum of 90 degrees.

Cab Side Access Doors Hinged At Front Edge

The cab side access doors shall be vertically hinged at the front edge.

Cab Side Access Door Stays - (2) Strap Style

The doors shall each have a strap style door stay.

SCBA Mounting Bracket

A SCBA mounting bracket (model discussed at pre-construction shall be mounted I the side cab access door for the driver's SCBA unit.

Cab Side Access Door Latch Position - Upper Part Of Door

The "D" handle type latches shall be provided on the upper part of the door.

Keyed Locks

There shall be keyed locks for both the cab side access doors. The driver's side and officer's side access doors shall be keyed alike with #1250 keys.

Electronic Door Locks

The vehicle shall be provided with electronic door locks on all four access doors. The driver and officer shall have a button on their respective sides to lock or unlock all 4 doors.

Cab Side Access Door Sill Protectors

Brushed stainless steel sill protectors, approximately .50" wide, shall be provided on the cab side access door sills to protect the painted finish.

Compartment Lights - LED

Each cab side access door shall have a LED lighting strip installed. The full height lighting strip shall be mounted vertically at the hinged side of the cab door. The LED lights shall be mounted in an anodized aluminum track. A switch, installed in the door jam, shall be used to activate light.

Front Aluminum Inner Liners

Semi-circular inner liners shall be provided in each front wheel housing. They shall be constructed of aluminum and shall be bolted in place so they may be removed if damaged. Self-tapping sheet metal screws are not acceptable. The outside edge of the inner liner shall be bolted along its entire length. The bottom edge of liner shall not have a formed reinforcement flange to avoid trapping dirt and debris.

Front Fenderate

Polished stainless steel fenderettes shall be installed in the front wheel openings. They shall be sufficiently wide to completely cover the front tire and reduce wheel splash along the sides of the cab. They shall be installed with 1/4" hex head bolts (self-tapping sheet metal screws are not acceptable) and have a full width rubber welt placed between the fenderette and body wheel well opening flange.
Outside edge of welting shall form a "V" bead between fender and cab side face to prevent moisture from entering. Inside edge shall also have a small, raised bead. Outside the edge of fenderette, at the wheel opening shall be rolled inward to

eliminate a sharp edge and avoid injury when cleaning apparatus.

Front Mud Flaps

Heavy duty mud flaps with the manufacturer's “logo" placed on the rear face shall be provided and installed to the rear of the front wheels. Flaps shall be 14" wide and be made of 0.38" heavy duty rubber material to prevent "sailing".

Rear Mud Flaps

Heavy duty rear mud flaps with the manufacturer's " logo" placed on the rear face shall be provided and installed to the rear of the rear dual wheels. Flaps shall be 24" wide and be made of 0.38" heavy duty rubber material to prevent "sailing".

Cab Mirrors With Automatic Temperature Control

Two (2) Lang Mekra 300 Series smooth chrome-plated West Coast style or equivalent main and convex mirrors shall be installed, one (1) on each side of the vehicle. The main mirror shall be a four-way heated, remotely controlled adjustable 7" x 16" second surface chromed flat glass. The convex shall be a four-way adjustable 7" x 7" second surface chromed 400 mm radius glass.

The mirrors shall have a built-in temperature sensor that will automatically control the surface temperature of the mirror. An additional on/off switch is installed for mirror heat.

Mirror Wiring - Through Ignition

The mirrors shall be wired through the ignition.

Windshield

The windshield shall be of tinted with automotive laminated safety plate glass with a curved two-piece design. The windshield shall have approximately 2900 square inches of visual area. Right and left-hand windshield glass shall be symmetrical and interchangeable from side to side to minimize spare parts stock and expense. Windshield shall be installed and held in place by an extruded rubber molding with a bright finish, decorative, locking bead. Cab shall be finished painted prior to windshield glass being installed.

Windshield Wipers And Washers

One (1) wet arm operated windshield wiper shall be provided for each plate of windshield glass for accessibility and optimum windshield wiping surface areas. Wipers shall be two speed type with intermittent wiping features. One (1) control switch shall be provided and located on the self-canceling directional switch for both wiper arms. The switch shall combine the on/off (automatic park position), two speed, intermittent and washer functions in one control. The turning switch shall activate the wipers and control speed and pushing it shall operate the washers.

Windshield Washer Reservoir

A manufacturer’s standard windshield washer fluid reservoir shall be provided. It shall be accessed in the driver’s step well with a remote fill. A visual inspection shall be possible without tilting the cab (NO EXCEPTIONS).

Door Windows

A retractable window with automotive type tempered safety glass shall be provided in all four (4) cab doors. All glass shall be tinted. Glass shall slide in stainless steel side channels with cloth/fiber liners. Rubberized fiber seals shall be located at the bottom of the window opening to prevent water and debris from entering the interior of the door when the glass is up (or down). A seal shall be placed on both sides (interior and exterior) of the glass. The size of the door glass shall be manufacturer's standard. The door window openings shall be trimmed on the exterior side with a smooth, black, poly vinyl chloride (PVC) molding

All door windows shall be controlled electronically by installing a window control switch at each door and a 4-switch (1 for each window) installed at the driver's position, preferably mounted on the driver's door.

Cab Door Hinges

All piano hinges on the exterior cab doors shall be mill finished.

Cab Exterior Handrails

Four (4) 24" handrails shall be installed on the side of the cab, one just to the rear of each cab door. The handrails shall be 1-1/4" diameter extruded aluminum, knurled, with a bright anodized finish.

All handrail stanchions shall be chrome plated. They shall be bolted to the body with 1/4" stainless steel hex head bolts. Stanchions shall have a rubberized gasket placed between them and the body surface they are mounted on. A drain hole shall be provided in each bottom stanchion.

All handrails shall have an LED as a backlight on the rear side of the handrail. Color to be determined during pre-construction.

Cab Interior Grab Handles

The following grab handles shall be provided on the interior of the cab and cab doors:

· Four (4) 6" chrome grab handles shall be provided, one on the inside of each cab door:

· Two (2) 12" rubber-covered grab handles shall be provided, one on the driver's side and officer's side front A-pillar, above the door hinge, to assist in entry to the cab.

Crew Cab Interior Grab Handle

Two (2) 12" rubber-covered grab handles shall be provided, one on each rear crew door hinged-pillar, on the hinged side of the door, to assist in entry to the cab.

Crash Test

The cab shall be certified for the following tests:

· SAE J2420: Cab Over Engine (COE) Front Strength Evaluation - Dynamic Loading - Heavy

Trucks
· SAE J2422: Cab Roof Strength Evaluation - Quasi Static Loading - Heavy Trucks
· ECE Regulation 29: Protection of Occupants of Cab in Commercial Vehicle

Performance Measure:

· After undergoing each test, the cab of the vehicle shall exhibit a survival space accommodating a 50th percentile male ATD in the median position without contact between the manikin and non-resilient parts for all seating positions.
· None of the doors shall open during the tests.
· The cab attachments may be distorted or fractured; however, the cab shall remain attached to the vehicle frame in at least one attachment location.

Helmet Holder – Body

The helmets shall be stored in the body in accordance with NFPA 1901 current regulations: NFPA 14.1.8.4.1

A location for helmet storage shall be provided.

NFPA 14.1.8.4.2 If helmets are to be stored in the driving or crew compartment, the helmets shall be secured in compliance with 14.1.11.2.

Caution Labels

Caution labels shall be posted in the cab so that they shall be visible from each seat position. The labels shall read: "Do Not Wear Helmets While Seated".

Collision Avoidance System

A HAAS Alert Responder-to-Vehicle (R2V) collision prevention solution shall be installed to provide real-time digital alerts to increase safety by notifying drivers in advance when crews are on-scene and responding. The digital alerts shall be delivered to navigation apps on smart phones and in-vehicle navigation systems.

The system shall include the HA-5 Transponder, R2V Safety Cloud® subscription, and Situational Awareness Dashboard. The transponder shall include cellular data service. The customizable Dashboard enables real-time operational status of the entire fleet on any device. The HA-5 Transponder shall be installed on the lower center dash to the driver's side, with a clear view of the sky for optimal GPS signal strength.

HAAS Alert shall provide a two-year warranty on the HA-5 Transponder.

A two-year subscription to the HAAS Alert R2V Safety Cloud® shall be provided. The subscription service shall be administered and serviced by HAAS Alert.

Headliner

The cab shall be provided with a removable gray headliner for ease of servicing the electrical wiring placed in the cab roof. The headliner shall consist of 3 layers of material. Next to the roof shall be a layer of acoustic insulation made of polyester and polypropylene fibers. The next layer is 1/4" thick Luann. Finally, there is a 1/4" thick layer of foam/perforated acoustic vinyl.

The headliner shall be the multi-piece type (minimum of three (3) sections) so that the entire liner does not have to be removed for localized maintenance.

Back Liner

The cab shall be provided with an aluminum tread plate removable back liner. The back liner shall be the multi-piece type (minimum of three (3) sections) so that the entire liner does not have to be removed for localized maintenance.

Head Bumpers

Two (2) padded gray vinyl head bumpers shall be provided on each side on the interior of the cab above the crew doors in the header area.

Engine Enclosure

The engine enclosure structure shall have a 1-1/4" thick inner lining, on the engine side, comprised of aluminized foil and foam/barrier composite for heat insulation. The tunnel cover shall have 1/2" decoupled foam lower and 1" decoupled foam upper covering, on the cab interior side, for noise insulation. The top forward portion of the hood shall have a full-width riser with a sloped face for the installation of the switch panel. The sloped panels shall be used for vehicle accessory controls. A minimum of 1" shall be provided between the right edge of the accelerator pedal and the side of the engine hood. A removable cover over the engine enclosure and insulation shall be coated with dark gray LINE-X® to act as an insulator for sound and engine temperature, as well as to provide an easy-to-clean work surface.

In order to optimize in-cab vision and seating space for the driver, officer and crew members while properly seated and belted in turn-out gear, the maximum overall dimensions of the engine enclosure shall not exceed:

- 26.25" from floor to top of engine tunnel between driver and officer
- 26.25" from floor to top of engine tunnel at front center dash panel
- 31.25” from floor to top of driver and officer dash panels

Accessory Mounting Structure

The top portion of the engine enclosure shall have a 1/8" thick aluminum channel frame located between the engine tunnel structure and the cover to support the cover and facilitate mounting of accessories and equipment.

Engine Compartment Access Door

An access door shall be provided at the rear of the engine enclosure for routine engine fluid checks. The access door shall be insulated from engine heat with aluminized foil/foam/barrier composite and sealed to prevent exhaust fumes from entering the crew cab. The engine access door shall measure approximately 27.5" wide x 11.25" high.

Removable Panels - Tunnel

A set of access panels with a LINE-X® coating to match the engine tunnel shell shall be installed on top of the engine tunnel shell. They shall only provide access into the area beneath the shell and not into the actual engine tunnel. They shall be approximately the full width of the tunnel and shall be provided on each side of the horizontal split.

18" Steering Wheel With Tilt/Telescope

A padded 18" steering wheel with center horn ring shall be provided. The upper steering column shall be of the tilt and telescopic type. A self-canceling directional switch with wiper control and headlight dimmer control shall be mounted on the steering column with an ICC four way flash switch. The
self-canceling directional switch shall be easily removable and replaceable without removing the steering wheel or column assembly. The junction of the shaft and the cab floor shall be sealed to prevent air exchange between the cab interior and exterior.

Dark Gray Line-X® For Cab Dash

The cab dash shall be sprayed with dark gray LINE-X® having a high resistance to abrasion and tearing. A vinyl cloth glued or laminated in some manner to a metal backing surface shall not be acceptable.

The LINE-X® shall absorb impact without surface damage. The LINE-X® shall be resistant to gasoline, diesel fuel, paints, bleaches, organic solvents and other cleaning agents and chemicals. It shall include sound dampening and vibration elimination properties.

The LINE-X® shall be solvent free and be environmentally safe to apply with no VOC or CFC hazards. Its surface shall have a non-glare, granular texture and be easily cleaned with common cleansing compounds.

Overhead Dash

An overhead drop down dash shall be provided with a full-length piano hinge and four (4) 1/4 turn latches. This dash shall incorporate areas designed to hold emergency switching and selected options such as control heads and indicators that shall be accessible to the driver and officer. The overhead dash shall have a dark gray LINE-X® coating.

Limiting Strap

A strap shall be provided to limit the extent of opening range for the overhead power distribution area (overhead dash) access. This 2” wide, retention strap shall prevent the contact between the upper, overhead, power distribution access housing and the lower, center, dash housing. An approximate clearance of 3 inches shall be maintained between the upper and lower dash structure and retained by the strap. The strap shall be fastened by footman loops between the cab roof structure and hinged upper power distribution housing.

Officer's Dash

The top of the officer's dash shall include a pocket for a laptop computer. The pocket shall measure 15.25" wide x 8.75" deep x 3.00" high at the rear.

Sun Visors

Two (2) approximately 8" x 28" padded, gray sun visors shall be provided, one on the driver's side and one on the officer's side. Visor shall be supported at both ends to prevent drooping.

Vehicle Dimension Sign

A sign shall be provided in the front cab area indicating the height of the completed apparatus in feet and inches, length of the completed apparatus in feet and inches, and the gross vehicle weight rating (GVWR) in tons.

Driver's Seat

The driver's seat shall be an H.O. Bostrom Sierra Air-100 reclining high back seat with air suspension. This seat shall have 5" horizontal adjustment.

Seat Riser - Driver, 3" High

The driver's seat shall be held at NFPA regulated height by a 3CR12 stainless steel frame that measures approximately 15.5" wide x 3" high x 17.5" deep, front to back at the top and 14.5" deep front to back at the bottom. There shall be a panel on the front and a side opening.

Seat Belt

The driver's seat shall have a 3-point vertically adjustable D Loop style shoulder harness, to meet FMVSS and NFPA 1901 current edition requirements. The seat belt shall be red in color.

Officer's Seat

An H.O. Bostrom Tanker 450 SCBA seat shall be provided for the officer. This seat shall have 5" horizontal adjustment.

Seat Riser/Compt - Officer, 10.63" High, Short Depth

The officer's seat shall be held at NFPA regulated height by a 3CR12 stainless steel frame which creates an enclosed compartment. The compartment measures approximately 15.5" wide x 10.63" high x 17.35" deep, front to back at the top and 8.97" deep front to back at the bottom.

Seat Riser/Compartment Door - Front Opening, 13.5"W X 8" H, Drop-Down

The seat riser/compartment shall have a front opening drop-down door that measures 13.5" wide by 8" high.

SCBA Bracket - Secureall™, Bostrom Seats Only (Ea)

One (1) NFPA compliant H. O. Bostrom SecureAll™ universal SCBA bracket shall be installed in the seat(s).

Seat Belt

The officer's seat shall have a 3-point vertically adjustable D Loop style shoulder harness, to meet FMVSS and NFPA 1901 current edition requirements. The seat belt shall be red in color.

Cable Raceway

A cable raceway, 1.75" x 5.75", shall be installed underneath the officer's floor. It shall run between the officer's kick plate and the seat riser.

Cable Raceway Opened Underneath Officer Seat

The cable raceway shall be opened underneath the officer seat to assist in the installation of radio or additional equipment.

Cable Raceway Pull Wire Provided

A pull wire shall be provided within the cable raceway to assist in the installation of radio or additional equipment.

Rear Seating

The rear crew cab section shall contain two (2) outboard rear facing H. O. Bostrom Tanker 450 SCBA passenger seats. The seats shall be installed one (1) each side at the rear of the engine enclosure. The seating area shall allow maximum room for fire fighters in full turn out gear.

SCBA Bracket - Secureall™, Bostrom Seats Only (Ea)

Two (2) NFPA compliant H. O. Bostrom SecureAll™ universal SCBA bracket shall be installed in the seat(s).

Seat Belts

The two (2) outboards, rear facing seat(s) shall have a 3-point horizontally adjustable D Loop style shoulder harness, to meet FMVSS and NFPA 1901 current edition requirements. The seat belts shall be red in color.

Seat Upholstery

All cab seats shall be upholstered in black colored vinyl material.

Interior Décor

The following components shall always be black in color:

- Floor matting and floor mat edging
- Headliner trim
- Back liner trim
- Crew heater, complete assembly
- Electrical panels
- Plastic snap plugs for wire access holes
- Door seals
- Seat risers
- Under seat compartments
- Rubber covered grab handles
- Map Desk, if present

The following item shall always be gray in color:

- Seat belt retractor cover.

Capacity Sign

A sign visible to the driver, that states the number of personnel the vehicle is designed to carry, shall be provided

Logos On Seats

The fire department's Logo shall be embroidered onto the following seat locations, unless specified differently: on the headrest if present, or the front of the seat back cushion if not.

Cab Storage Compartment

A storage compartment with an opening on each end of the compartment shall be provided on the rear wall of the cab. The compartment shall have a "sweep out" design. The overall outside dimensions of the compartment shall be 40" wide x 22" deep x 40" high. The compartment shall be constructed of 1/8" aluminum. The exterior shall have a LINE-X coating that shall match the lower cab dash/ engine tunnel. Due to the space taken up by the false wall and the inside face of the doorway. The usable floor shall be approximately 36.5" x 19.125" deep.

Cab Compartment end secure

A black cargo net shall be provided over the cabinet side opening to secure stored equipment. The netting shall be made of two (2) inch wide black cargo netting with approximately two (2) inch square openings. The netting shall be fastened on the bottom with footman's loops. The top of the netting shall have two (2) seat belt buckles to secure/ release the cover, one (1) in each corner. The male portion of each buckle shall be secured to the top of the netting, the female receiver portion shall be secured to the header of the compartment. A pull strap with loop handle shall be attached to each female receiver to release the cover. Velcro fold overs to the interior of the compartment shall be located on the bottom of the netting to facilitate removal.

Compartment Lights - Led

The cab interior storage compartment shall have a ROM LED lighting strip installed. The full height lighting strip shall be mounted vertically at the right side of the cab compartment door (facing the compartment door). The LED lights shall be mounted in an anodized aluminum track. A switch, installed in the door jam, shall be used to activate light.

Adjustable Shelf Or Shelves

One (1) adjustable shelf shall be provided in the cab compartment. The shelf shall be made from 1/8" aluminum sheet metal and have welded corners and a DA finish on the outside edge of the shelf. It shall be supported by four (4) stainless steel angles bolted to "Alumastrut" tracks.

(Shelf Turned upside down (lip down))

12 Volt Receptacle(S) In Cab Compartment

One (1) 12-volt 15 amp power receptacle(s) shall be provided in the upper right corner of the rear wall of the cab interior storage compartment. The receptacle shall be wired battery direct, with a fused circuit.

Ussc Air Purifier System

A 12VDC --81G53015-12VD USSC Air purifier system shall be provided. It shall be wired to the ignition. The system will/shall draw a maximum of 1.5 amps and have a 5-amp integrated fuse in the wire harness Unit shall be placed on the engine tunnel rear removable panel as close to the rear as practical without causing interference with engine tunnel access door when it is deployed open. Unit will be placed so that the long dimension is running

side to side
Approximate exterior dimensions are 6.5" tall x 16.5" long x 6.5" wide

Heater/Defroster-Forward Cab

A front cab heater/defroster unit shall be provided. The unit shall have a heating capacity of 30,000 BTU and combined 520 CFM variable speed blower assembly. The unit shall be located on top of the engine tunnel and shall be centered on the windshield. Defroster outlets shall be located at the bottom of the windshield and shall direct air flow from the unit up to the windshields. Vents shall be located in the drivers and officers' dashes and kick plates.

Condenser Cover

The air conditioning condenser assembly shall have an additional cover and / or covers to protect the Freon hoses, dryer, valves, switches and / or solenoids above the cab roof and connected to the condenser body.

The main condenser body shall have one fabricated cover with openings for, and above, the condenser fans. The main condenser body cover shall be approximately 7.5" high x 46.5" long x 26.25" wide and fabricated from 1/8" aluminum tread plate.

Additional covers, formed from 1/8" aluminum tread plate, shall be provided for hose and harness routing above the cab roof, as necessary.

Note: Condenser location and orientation is dependent on other influential options.

Manual Coolant Shutoff Valve - Inlet

The forward cab heater inlet flow shall be interrupted by one (1) manual engine coolant shutoff valve mounted behind the engine for auxiliary engine coolant flow control. The valve shall be 1/4 turn style with label for ease of identification.

Manual Coolant Shutoff Valve – Return

The forward cab heater return flow shall be interrupted by one (1) manual engine coolant shutoff valve, mounted on the lower radiator tube, for auxiliary engine coolant flow control. The valve shall be 1/4 turn style with label for ease of identification.

Cab Air Conditioning System

The cab shall be equipped with an air conditioning system that shall include two (2) ceiling mounted evaporators. The air conditioning system shall have a combined cooling capacity of 79,000 BTU and variable speed blower assemblies for a combined 1100 CFM. The main controls for the unit shall be located in the dash. The evaporators shall have air diffusers to allow for multi-directional airflow. Each diffuser shall be adjustable up and down and side-to-side for individual preference. Each evaporator shall have its own sump style drain system for removal of condensation. The sump shall be integrated into the ABS evaporator cover.

The evaporators shall be compliant with all EPA regulations and use R-134A Refrigerant. All hoses used in the air conditioning system shall be "barrier" type construction for containment of the refrigerant.
The condenser assembly shall be a stacked type, low profile, dual fan compact design with dryer and pressure switch included. The condenser assembly shall include a white powder coated housing over the stacked condenser coils, as provided from the manufacturer. The condenser shall be located on the cab roof.

The air conditioning system shall exceed the industry norm by cooling the cab from the ambient temperature of 100

degrees Fahrenheit at 50% relative humidity to an average cab temperature of 75 degrees Fahrenheit in 30 minutes.

HVAC Controls - Forward Cab

HVAC controls shall feature rotary switches, function labeling, backlighting, and have colored indicators and shall be located in the center dash area between the driver and officer.

General 12-Volt Electrical Wiring Requirements 12-Volt Electrical System

The apparatus shall be equipped with a heavy-duty 12-volt electrical system. All 12-volt electrical equipment installed by the apparatus manufacturer shall conform to modern automotive practices. All electrical wiring and components installed in the apparatus shall be suitable for use in severe duty emergency vehicle applications.

General Wiring And Wire Harness Construction

Unless otherwise specified by the component supplier, all insulated wire and cable shall conform to SAE J1127 Low Voltage Battery Cable type SGX or STX, or SAE J1128 Low Voltage Primary Cable type SXL, GXL, or TXL.

Circuit feeder wires shall be stranded copper or copper alloy conductors of a gauge rated to carry 125 percent of the maximum current for which the circuit is protected.

Conductor materials and stranding, other than copper, shall be permitted if all applicable requirements for physical, electrical, and environmental conditions are met as dictated by the end application.
The overall covering of conductors shall be moisture-resistant loom or braid that has a minimum continuous rating of 194°F (90°C) except where good engineering practice dictates special consideration for loom installations exposed to higher temperatures.

The overall covering of jacketed cables shall be moisture resistant and have a minimum continuous temperature rating of 194°F (90°C) except where good engineering practice dictates special consideration for cable installations exposed to higher temperatures.

Circuit Identification

All wiring shall be uniquely identified by a circuit number and color coding. The identification shall be referenced on a wiring diagram. Wires less than 8 AWG shall be permanently identified at least every
2.0 inches (50.8 mm) by a circuit and function code.

Wiring Connections

All wiring connections and terminations shall use a method that provides a positive mechanical and electrical connection. The wiring connections and terminations shall be installed in accordance with the device manufacturer's instructions. Secondary locks shall be utilized on all connectors that are secondary lock capable.

Exterior exposed wire connectors shall be environmentally sealed to withstand elements such as temperature extremes, moisture and automotive fluids. Seal plugs shall be installed in all unused sealed connector cavities.

All ungrounded electrical terminals shall have covers or be in enclosures to protect against corrosion, excessive heat, excessive vibration, physical damage, liquid contaminants, dust, and other environmental factors.

Wiring splices shall be crimp-type, molded, or sonic weld type. Adhesive lined heat shrink tubing shall be used to seal

and insulate splice joints.

Wire And Cable Routing

Wiring routed through holes in sheet metal or castings shall have edges protected by an appropriately sized grommet.

Wiring shall be routed to avoid metal edges, screws, trim fasteners and abrasive surfaces. When such routings are not possible, protective devices (shields, caps, etc.) shall be used to protect the wires. When wires must cross a metal edge the edge shall be covered with a protective shield.

Wiring shall be routed to provide at least 3 inches (76.2 mm) clearance to moving parts, unless positively fastened or protected by a conduit.

Wire routes should avoid areas where temperatures exceed 180° F (82.2° C) and a minimum clearance of 6 inches (152.4 mm) shall be maintained from exhaust system components. Where compliance with this requirement is not possible, high temperature insulation and heat shields shall be utilized.

When wiring is routed between two members where relative motion can occur the wiring shall be secured to each member, with enough wire slack to allow flexing without damage to the wires.

Wiring to all circuit components (switches, relays, etc.) in exposed locations shall provide a drip loop to prevent moisture from being conducted into the device via the wire connection.

Routing wires into areas exposed to wheel wash shall be avoided if possible. When such routings cannot be avoided, adequate clipping or protective shields shall protect the wires from stone and ice damage.

Wiring shall be secured in its intended location with appropriately sized bolt-on clips and nylon wire ties.

Electrical components designed to be removed for maintenance shall include a sufficient length of wire to allow the component to be pulled away from the mounting area for inspection and service work.

Bulkhead type connectors or sealed fittings shall be used to prevent the entry of liquid contaminants into weather tight enclosures.

Spare Wires

Wiring harnesses from/to major power and signal distribution areas of the apparatus shall include spare wires for future expansion of the system.

Electrical System Components

Serviceable components shall be readily accessible. Switches, relays, terminals and connectors shall have a dc rating of 125% of the maximum current for which the circuit is protected.

A distributed power and signal system shall be utilized on the apparatus to minimize power supply voltage drops. Power and signal distribution areas in the cab shall be concentrated in five (5) areas.

A lower cab power and signal distribution center shall be located in the center forward portion of the cab "dash". It shall be hinged and opened by unlocking two (2) top mounted, double hinged, lift and pull latches. This area shall contain

relays and circuit breakers installed in a logical and serviceable fashion.

An additional lower cab power and signal distribution center shall be located below the officer's dash behind the kick plate.

An upper power and signal distribution area shall be located in the forward portion of the cab ceiling, above the engine tunnel. Components in this area shall be permanently labeled and easily accessible by opening a hinged cover.

A power and signal distribution area shall be located in the pump module, if applicable. Components in this area shall be permanently labeled and easily accessible.

A power and signal distribution area shall be located on the front of the forward body compartments. Components in these areas shall be permanently labeled and easily accessible.

All electrical components or devices installed in an exposed area on the outside of the cab or body shall be mounted in such a manner, or protected by a gasket, caulking or other means, so that moisture shall not accumulate in it.

Corrosion Protection

Externally exposed, non-plug type, electrical connections shall be given a hand applied or sprayed application of an industrial standard insulation coating with a minimum rating of 2100 volts per mil thickness. Insulation shall protect the connection from water induced electrical corrosion and accidental short circuiting. Should the connection be loosened or removed during the manufacturing process another coating shall be applied after it has been refastened or replaced.

Main Battery and Starter Circuits

Battery Power Buss

All positive cables from the batteries shall be connected directly to a positive battery buss bar located as close to the batteries as practical. The alternator shall be wired directly to the battery positive buss bar through the ammeter shunt, if one is provided.

Engine Starter And Interlock Circuits

The starter solenoid(s) shall be connected directly to the battery positive buss bar. An interlock shall be provided to prevent the operator from engaging the starter when the engine is running.

Battery Ground Buss And Single Point Ground System

All negative (ground) cables from the batteries shall be connected directly to a battery negative buss bar located as close to the batteries as practical. Appropriately sized ground feeder cables shall be utilized to provide a low impedance ground path to the negative buss bar for all electrical devices on the apparatus.

Apparatus Ground Bonding

The battery negative buss bar shall be connected to the chassis frame. The cab, pump enclosure (if furnished), and body structure shall be electrically bonded to the vehicle frame with braided copper grounding straps.

Emi/RFI Protection

The apparatus electrical system and related devices shall have the ability to function in the severe electromagnetic environment typical of fire ground operations.

Emi/RFI Emissions

State-of-the-art electrical system design and components shall be utilized to ensure the suppression of radiated and conducted EMI (electromagnetic interference) and RFI (radio frequency interference) emissions that may cause communication and navigation radio-reception interference. The electrical system and related components shall comply with the applicable sections of J551/1 Performance Levels and Methods of Measurement of Electromagnetic Compatibility of Vehicles, Boats (up to 15 m), and Machines (16.6 Hz to 18 GHz)

Emi/RFI Susceptibility

The apparatus electrical system shall incorporate immune circuit designs, filtering, shielding and twisted-pair wiring to control EMI/RFI susceptibility. Particular attention shall be given to harness and cable routing to minimize the potential for conducted and radiated signal susceptibility.

Electrical / electronic equipment on the apparatus shall not be susceptible to radiated and conducted EMI/RFI emissions from on-board radio transmitter(s) and shall comply with the requirements of SAE J551-12 Vehicle Electromagnetic Immunity-On-Board Transmitter Simulation.

Electrical System Performance Testing

An operational test shall be conducted to ensure that all installed electrical equipment is properly connected and is in working order. The apparatus alternator shall be tested with the total continuous electrical load applied and engine running up to the engine manufacturer's governed speed for a minimum of 2 hours. Additionally, all warning lights shall be run continuously during the three (3) hour NFPA pump certification test (or at another time for not less than three (3) hours). Activation of the load management system (if furnished) shall be permitted during this test. An alarm sounded by excessive battery discharge, as detected by the low voltage warning system, or a system voltage of less than 11.8 V dc at the battery for more than 120 seconds, shall be considered a test failure.

Cab Dash And Instruments For Emissions Engine

A non-glare instrument panel, custom designed to accommodate the appropriate functions, shall be provided. Illumination shall be provided for controls, switches, instruction plates, gauges, and instruments necessary for the operation of the apparatus. The cab dash shall be forward slanted and constructed of aluminum. Rocker switches that have integral lights shall be as follows when applicable: red indicator lights shall be provided for warning light and engine/mechanical functions, green indicator lights shall be provided for scene and auxiliary lighting and general functions; selection shall be at the manufacturer's discretion.

A system shall be provided that interacts with the electronics engine and eliminates redundant senders and switches. The electronic engine gauges shall receive information on the SAE J1939 data link to improve reliability and gauge accuracy. Connectors shall be utilized for ease of service. The dial face shall be black with white lettering. The primary letters shall be in Imperial with the secondary, smaller letters in metric. The dial shall have international non-language symbols for the gauge function (except speedometer). Gauges shall have illumination with a monochrome LCD display located on the speedometer gauge. They shall also have a 250-degree dial sweep for greater definition of scale. SAE J1939 Faults and Warnings shall be displayed on the LED display.

DRIVER'S INSTRUMENTATION

The following individually mounted gauges shall be provided: (all-inclusive gauge clusters not allowed, no exceptions)

Main Gauges

· 3" Speedometer:	0-85 mph with built-in LCD display
· 3" Tachometer:	0-4000 rpm

Satellite Gauges

· 2" Fuel Level:	Empty – full with low level warning indicator
· 2" Voltmeter:	10-18 VDC
· 2" Coolant Temperature:	100-280 Degrees Fahrenheit
· 2" Engine Oil Pressure:	0-100 psi
· 2" Transmission Oil Temp:	100-320 Degrees Fahrenheit
· 2" Front Air Pressure:	0-150 psi
· 2" Rear Air Pressure:	0-150 psi
· 2" DEF Level:	Empty – full with low level warning indicator

Audible Cab Alarms

Audible alarms shall be provided in the cab to alert the operator of conditions that require attention. The alarm device(s) shall be audible in the driving compartment.

An intermittent audible tone shall sound when the following conditions are present, and the parking brake is disengaged:

· Active Hazard Warning – (Do Not Move Apparatus; Door Open, Tower Raised, Ladder Rack Down, etc.)
· Seat Belt Warning (A separate and different tone than that for the Active Hazard Warning)

A steady audible tone shall sound when the following conditions are present:

· Stop Engine (includes High Engine Temperature and Low Engine Oil Pressure)
· Low Voltage
· Engine Air Filter Restriction
· Jackknife Warning (if applicable)
· Tiller Cab Operator Not in Position (if applicable)

Driver's and Officer's Controls

The following rocker style control switches shall be identified and accessible to the driver while seated. Switches shall include integral indicator lights (where applicable) to advise that the switch has been energized, and identification labels shall be illuminated for night driving.

· Ignition switch with green indicator light

- Engine Start switch
- Headlight / Tail-Marker-ID light switch
- Instrument Panel Dimmer control rheostat

The following controls shall be stalk mounted on the steering column and identified and visible to the driver while seated:

- Turn Signal Control and 4-Way Hazard Warning switch
- High-beam headlight switch
- Windshield wiper control switch
- Windshield washer control switch

The following controls shall be identified and accessible to the driver while seated:

- Parking (Spring) Brake Control
- High Idle control switch
- Other controls (as defined elsewhere in this specification)

The following controls shall be identified and accessible to both the driver and officer while seated. Controls shall be identified and illuminated for night driving.

- HVAC control panel
- Other controls (as defined elsewhere in this specification)

Driver's Indicator Light Display

The display with the following indicators shall be mounted in a removable modular panel in front of the steering column. The indicators shall be identified with universal ISO 2575 symbols where applicable and visible to the driver while seated. All applicable indicators in the modular panel shall automatically illuminate for 1 second upon activation of the ignition switch to verify operation:

- Battery Switch “On” green indicator light
- Ignition Switch "On" green indicator light
- Check Transmission amber indicator light
- High Transmission Temperature amber indicator light
- Check Engine amber indicator light
- High Coolant Temperature red indicator light
- Low Coolant Level red indicator light
- Stop Engine (Engine Warning) red indicator light
- High Exhaust Temperature (HEST) amber indicator light
- Diesel Particulate Filter Regeneration (DPF) amber indicator light
- Diesel Exhaust Fluid (DEF) Level amber indicator light
- Wait-to-Start amber indicator light
- Malfunction Indicator Light (MIL) amber indicator light
- ABS warning amber indicator light
- Automatic Traction Control/Electronic Stability Control activated amber indicator light
- Spring (Parking) Brake "On" red indicator light
- High Beam “On” blue indicator light
- Low air pressure red indicator light
- Left Turn signal green indicator light
- Right Turn signal green indicator light

Within the display shall be four (4) separate pages defined as noted:

- Page 1 Digital Speedometer
- Page 2 Digital Tachometer

· Pages 3 & 4 shall show additional engine information

Emergency & Work Light Switch Panel - Driver's Side

All emergency light and work area lighting control switches shall be mounted in a removable panel located in the overhead position on the driver's side of the cab. The light switches shall be "rocker" type with an internal indicator light (where applicable) to show when the switch is energized. All switches shall be properly identified by an illuminated label for night driving.

A master warning light switch, red in color, shall be provided for emergency lighting.

A momentary clear warning light switch shall be provided for clear emergency lighting control that shall default on.

Work lights are defined as ground, step, rear pick up, hose bed or dunnage area, if on the apparatus and specified.

Door Ajar/Hazard Indicator Light (Do Not Move Apparatus)

A Whelen "T0" series 2" round red flashing LED light with chrome flange shall illuminate automatically whenever the apparatus parking brake is not fully engaged and any of the following conditions exist:

· Any passenger or equipment compartment door is open.
· Any ladder or equipment rack is not in the stowed position.
· Stabilizer system is not in its stowed position.
· Powered light tower is extended.
· Any other device permanently attached to the apparatus is open, extended, or deployed in a manner that is likely to cause damage to the apparatus if the apparatus is moved.

The hazard warning light shall be identified with a label that reads: “Do Not Move Apparatus When Light Is On.” The light shall be located on the ceiling between the driver and the officer.

Digital Clock

A 24-hour real-time digital clock shall be identified and visible to the driver while seated.

Electrical Wiring Requirements - Intelex™ Plus

The apparatus shall be equipped with an INTELEX™ PLUS management system for control of the electrical system devices, where applicable.

Circuit Protection

Circuit protection devices shall be utilized to protect each electrical circuit. All circuit protection devices shall be sized according to 125% of the anticipated load to prevent wire and component damage when subjected to extreme current overload.

Solid State Circuit Protection

Intelex power distribution modules shall utilize solid state output channels and feature fully protected high-side drivers (+12V) to protect wiring. High-side drivers shall provide overload protection, current limitations, transient protection, and replicate the function of an automatic reset circuit breaker. If output current exceeds the rated amperage, the output shall automatically turn off. After 30 seconds, the module shall attempt to re-energize the load. If the output is still overloaded, it shall remain off until the power is cycled. In the event of a loss of communications with the vehicle's control module, all outputs not controlling a moving device, such as a ladder rack, shall remain in their previous state until communication is restored or the power is cycled.

Non-Solid State Circuit Protection

Circuit breakers shall be Type-I automatic reset (continuously resetting) and conform to SAE J553 or J258 unless operational requirements and/or safety concerns dictate Type-III manual reset type conforming to SAE J1625. Automotive-type fuses conforming to SAE J554, J1284, J1888 or J2077 shall be utilized when required to protect electronic equipment.

Power Control Relays and Solenoids

Power control relays and solenoids shall have a direct current (dc) rating of 125 percent of the anticipated current load.

Bussmann Mvec Relays and Circuit Protection

Manufactured as a hardened and weather tight module, the mVEC is rated at 200 Amps. The mVEC is configured to provide various OEM circuit protection and switching functions, using industry standard fuses, relays and breakers, with the status and control of each circuit accessible through J1939 CAN open messages. Each mVEC is rated at 200 Amps, with individual outputs rated up to 30 Amps. Waterproof to high pressure spraying (IP66 equivalent). The mVEC is designed and manufactured with robust features such as heavy-duty housing, silicon and Gortex gaskets, and protective conformal coated electronics, to operate in demanding vehicle environments such as those found in fire apparatus.

Information Center Lights

A 5" color display capable of displaying graphical images as well as text messages shall be located on the cab dash. The main display page shall include the date, time and ambient air temperature in Fahrenheit. Additional information pages shall be provided for the warning indications, not stowed indications, and open doors. The display shall be dimmable with a Rheostat control on the dash and shall have an override button on the control to dim to ten (10) percent.

Apparatus Status Indicators And Audible Alarms

If a monitored "Not Stowed" or "Warning" condition is active, the corresponding status indicator shall flash. In addition to visual indicators, audible alarms shall sound when designated conditions activate the "Not Stowed" and "Warning" status indicators.

Warning Indicator

A flashing red triangle symbol shall alert the vehicle occupants of an active "WARNING" condition. This is defined as a situation or status on the vehicle that is of high priority or "mission critical" nature. The flashing red triangle shall be displayed on the Information Center and dash gauge panel in front of the driver. The following are typical "Warning" (high priority) conditions:

· HYDRAULIC FILTER
· AIR RESTRICTION
· LOAD MANAGE
· LOW AIR PSI
· CAB NOT LOCKED
· ABS FAULT
· LOW VOLTAGE
· JACK KNIFE
· TRAILER ABS

Not Stowed Indicator

A flashing Not Stowed indicator shall alert the vehicle occupants of an active "Not Stowed" condition. This is defined as a situation or status on the vehicle that is not of high priority or "mission critical" nature, but requires attention before the vehicle is put in motion. The following are typical "Not Stowed" (not high priority) conditions:

The following items are considered Not Stowed only when the parking brake is released.

· DS TELE LIGHT UP
· PS TELE LIGHT UP

Alarms

The following conditions shall cause the audible alarm to sound "steady" (not an intermittent beep); signifying a "mission critical" condition exists that requires immediate attention.

· STOP ENGINE
· LOW AIR
· LOW COOLANT
· CAB NOT LATCHED
· LOW VOLT
· ABS FAULT
· LOW OIL PRESSURE

Corresponding "Low Air", "Stop Engine" visual indicators shall be located in the dash gauge panel in front of the driver.

The following conditions shall cause a chime alarm to sound "intermittently" (i.e., beep), once the parking brake is released, signifying a condition exists that may become "mission critical" if not quickly addressed.

· ANY BODY DOOR OPEN
· ANY CAB OR CREW CAB DOOR OPEN

An audible alarm shall sound if any of the seat belts are not properly closed and the vehicle is going 5 mph or greater. The sound shall be different from all other audible alarms in the cab.

Open Doors

When a cab or compartment door is open, the "DOORS" indicator shall flash. Pressing the corresponding button shall

display an overhead graphical representation of the apparatus. This image depicts the open cab door(s), open compartment door(s), deployed equipment rack(s), and/or extended step(s). The chime alarm shall also sound when the parking brake is released.

Customer Information On Display - Customer Name & City

The customer's name and city shall display on the information display screen.

Customer Information On Display Shall Not Be PIN Protected

Customer information on the display shall not be PIN protected.

Automated Electrical Load Management System

The apparatus shall be equipped with an automated load management system. The load management

system shall monitor battery voltage and activate the engine high idle system (provided NFPA interlocks have been established) before disabling any electrical loads. If engine high idle is not available or activation does not result in sufficient battery system voltage, individual electrical loads shall be automatically and sequentially deactivated until voltage returns to an acceptable level. Loads shall be sequentially reactivated to avoid a sudden large voltage demand on the system. Electrical loads defined in NFPA 1901 as “minimum continuous” shall not be subject to automatic load management. Load prioritization shall be independently field programmable by authorized users.

If the load management system becomes active, the “LOAD MANAGE” indicator shall illuminate on the "Warnings" page of the INTELEX™ PLUS cab mounted display.

Load Sequencer

A sequential switching device shall automatically energize the specified optical warning devices to minimize potentially damaging voltage fluctuations due to the sudden addition or removal of large current demands on the electrical system. Upon activation of the “EMERGENCY MASTER” warning switch and provided the individual optical warning device switches are also activated, the following loads shall be activated (or deactivated) in 0.5 second intervals:

- Front Light Bar
- Side Light Bar (if applicable)
- Front and Rear Flashing Lights
- Side Warning
- Rear Beacons
- High Beam Headlight Flash

Vehicle Data Recorder And Seat Monitor Display

Fire Research series SBA200-A00 (OR EQUIVALENT) seat monitor display and vehicle data recorder kit shall be installed. The kit shall include a seat monitor display module, a vehicle data recorder, and cables.

The seat monitor display shall be programmable for up to twelve (12) seats and have a seatbelt icon for each. A message display, push buttons for navigating through programs, and vehicle system warning indicators shall be located on the front of the seat monitor display.

The data recorder case shall be waterproof. It shall have inputs for monitored information from the vehicle J1939 CAN bus, independent sensors, seatbelt and seat occupied switches, outputs for audible alarms, and two-way FRC datalink connectors.
The vehicle data recorder shall record the following data once per second and store it in a 48 hour loop:

- Vehicle Speed
- Acceleration
- Deceleration
- Engine Speed
- Engine Throttle Position
- ABS Event
- Seat Occupied Status
- Seat Belt Status
- Master Optical Warning Device Switch
- Time
- Date

The vehicle data recorder shall record the following data once per minute and have memory to store it for 100 engine hours:

- Maximum Vehicle Speed
- Maximum Acceleration
- Maximum Deceleration
- Maximum Engine Speed
- Maximum Engine Throttle Position
- ABS Event
- Seat Occupied with Seat Belt Unbuckled
- Master Optical Warning Device Switch
- Time
- Date

The oldest data shall be erased first when memory capacity is reached. All data shall be password protected and upload able from the vehicle data recorder to a computer running FRC HAWK data management software. The HAWK software shall store, manage, provide graphic displays and produce formatted reports of the vehicle data recorder.

Electrical System Diagnostics

The apparatus shall feature on-board electrical system diagnostics and provision for off-board diagnostic service equipment.

On-Board Diagnostics

On-board diagnostic indicators shall be provided to support rapid troubleshooting of the INTELEX™ PLUS based electrical power and signal system. The input and output status of each INTELEX™ PLUS system module shall be easily determined through easy-to-use display pages.

Switches shall be provided in the cab to allow the operator or service personnel to obtain On-Board diagnostic information from the ABS system and Engine Controller.

A troubleshooting guide shall be provided with the vehicle to assist with interpretation of the diagnostic signals.

OFF-BOARD DIAGNOSTIC PROVISION

An interface port shall be provided for service access to the INTELEX™ PLUS data bus. The diagnostic port shall be mounted inside the cab on the driver side in a location that is accessible from the ground.

POWER STUDS (OVERHEAD SWITCH PANEL)

Three (3) studs shall be provided in the overhead switch panel to provide a 12-volt feed. The studs shall consist of a 12-volt direct stud, switched battery stud and grounding stud.

POWER STUDS (CAB DASH)

Four (4) studs shall be provided in the cab dash area to provide a 12-volt feed. The studs shall consist of a 12-volt direct stud, switched battery stud, switched ignition stud and grounding stud.

Buss Bar (Under Officer's Seat)

A four (4) stud 30 Amp buss bar with protective cover shall be provided under the officer's seat to provide a 12-volt feed. The studs shall consist of a 12-volt direct stud, switched battery stud, switched ignition stud and grounding stud.

Buss Bar (Under Engine Tunnel)

One (1) four (4) stud 30 Amp buss bar(s) shall be provided under the rear engine tunnel panel to provide a 12-volt feed. The studs shall consist of two (2) 12-volt direct studs, switched battery stud, and grounding stud.

Dash Layout

The Manufacturer shall furnish a dash layout drawing to the Fire Department for their review and approval. The drawing shall detail the locations for installation of radios, sirens, light switches, gauges, etc. Due to the cab dash configuration and electrical wiring design, the components shall have designated locations that each will fit. The Fire Department shall review and approve the layout during the Engineering Conference.

Pump Engagement Controls And Indicators

A "Pump Engaged" indicator shall be provided in the driving compartment to indicate the pump shift has been successfully completed. An "OK to Pump" indicator shall be provided in the driving compartment and on the pump operator's panel to indicate that all the following conditions have been met to safely operate the pump in stationary mode:

- The pump shift is engaged.
- The parking brake is engaged.
- If the pump is driven from a transfer case PTO or auxiliary transmission PTO, the drive to the wheels in neutral.
- If the apparatus is equipped with an automatic transmission, the chassis transmission is in the correct pump gear as follows:

o If the pump is driven by a PTO after the chassis transmission gearing (e.g., split shaft PTO, transfer case PTO, etc.) the transmission is in the correct forward drive gear as noted in the shift instruction placard located in the driving compartment.
o If the pump is driven by a PTO ahead of the chassis transmission gearing (e.g. flywheel PTO, crankshaft PTO, etc.) the transmission is in neutral.

A "Throttle Ready" indicator shall be provided on the pump operator's panel. The "Throttle Ready" indicator shall indicate when the pump is in "OK to Pump" mode.

USB Charger Port

One (1) Kussmaul Electronics model 091-219-5 USB 2.4/2.4 Amp Dual Charger Ports shall be wired battery direct with a fused circuit and shall be located on the dash as follows:

Location of USB charger port shall be determined at the pre-build conference.

Two-Way Radio Antenna Mount(S)

Two (2) universal antenna mount(s), model MATM, with 17 feet of coax cable and weatherproof cap shall be provided for the two-way radio equipment.

Antenna Lead - Terminates In The Center Lower Dash

The antenna lead shall terminate in the center lower dash. Any excess cable shall be secured in an accessible location.

Antenna Location - Behind Light Bar

The antenna location shall be installed in the cab roof, behind the light bar.

Antenna Mount

The manufacturer shall provide3 the antenna mount for the roof

Mobile Radio(s) - Make & Model

The make and model of the mobile radio(s) is: TBD

Intercom system

The Alsip fire Department shall provide the Setcom Communication system for the manufacturer to wire in while manufacturing the cab components.

Intercom Location - Upper Dash

The intercom shall be located on the upper dash.

Radio Interface Cable

The intercom shall interface with the mobile radio utilizing a mobile radio interface cable. The cable shall be a minimum

of 4 feet long. The cable shall have a 9-pin connector at the intercom and a connector meeting the requirements of the mobile radio to be supplied and installed on the apparatus.

Rear View Camera System

A Zone Defense rear view camera system, ZD.323.1.4, (or equivalent) shall be installed. The system shall consist of the following items:

- One (1) ZD.M.302 7" color LCD 22 pin, digital monitor, 182mm wide x 122mm high x 26mm thick with speaker 7G rated.
- One (1) CAM.313C Color camera with 1-3" Color CCD Sensor, True Zero Light Night Vision with 18 infrared LEDs and a microphone 120-degree lens, 10G, 1P69K rated.
- One (1) ASSC.402.302 remote control.
- One (1) ASSC.400D Pana-vise mount shall be used to mount the monitor. Pana-vise mount shall be a T-bolt all-metal construction, pedestal mount with a 6" rise and adjustment knob.
- One (1) 65-foot cable.
- All required mounting hardware.

Camera Monitor Shall Be Hung From The Overhead, Zone 9, Driver's Side

The camera monitor shall be hung from the overhead console in zone 9, placed to the driver's side of the removable panel.

Rear View Camera Color - Black

The rear-view camera color shall be black.

Rear Camera Location - Recess Mount, Rear Center Upper Bulkhead

The rear-view camera shall be recess mounted on the rear upper bulkhead, close to center. The recess for the camera shall be constructed of mill finish aluminum. The camera cannot interfere with the storage or deployment of large diameter hose.

Batteries

Six (6) 12V Group 31 950 CCA batteries shall be installed three on each side of the cab under the rear entrance way.

Heavy-duty battery cables shall be provided to maximize power available to the electrical system.

Jumper Cable Studs

A pair of jumper cable studs with color coded covers shall be provided under the driver's side battery storage area.

Battery And Electrical Component Storage Areas

Battery and electrical component storage areas shall be constructed of stainless steel with structural steel tubes at the corner mounting points and shall be located one (1) each side mounted on the vehicle frame. They shall be well ventilated and enclosed to protect against road splashes and debris. Suitable provisions shall be provided for drainage.

The batteries shall be held firmly in place by providing a full frame type top clamp which encloses the battery set on all

four (4) upper corner sides. The one-piece clamp shall be fabricated of 3/4" angles and be held in place by four (4) "J" shaped clamping bolts placed in the corners. Battery inspection shall be available by tilting the full tilt cab.

Battery Box Finish - Gloss Black Paint

The whole battery box (interior and exterior) where the batteries are installed shall be painted gloss black.

Battery Mats

The batteries shall be installed on a non-corrosive Turtle Tile mat.

Disconnect Switch

A master load disconnect switch shall be provided between the battery positive buss bar and the remainder of the switched battery electrical loads on the apparatus. A green "battery on" pilot light that is visible from the driver's position shall be provided.

One (1) single battery system switch mounted near the driver's side front entrance in a location so it may be turned off by a person standing on the ground outside the vehicle. It shall have the capacity to handle 350 amps of continuous power.

Battery Charger

There shall be one (1) Kussmaul model 091-200-12, LPC-40 single battery charger system installed in the vehicle's electrical system. The charger shall be fully automatic and shall maintain the truck batteries at a full charge level when connected to a 120 VAC source. Remote sensing shall be provided to compensate the charger output for the voltage drop in the charging wires.

Display

A remote mounted display, model 091-200-IND, shall be included which shall contain one bar graph to display the condition of the batteries. The remote display shall be mounted in the cab overhead console.

Charger/Compressor Location - Wall Adjacent To Side Window On Driver's Side

The battery charger/compressor shall be located on the driver's side wall adjacent to the side window.

Battery Charger/Air Compressor Cover

A smooth aluminum cover shall be provided over the battery charger/air compressor. The outside finish shall match the cab interior finish.

Auto Eject Plug

A Kussmaul 20 Amp, 120 VAC "Super Auto Eject" shoreline power connector shall be provided for the battery charger. The shoreline power connector shall be provided with a spring-loaded cover to prevent water from entering when the shoreline is not connected. A label shall be permanently affixed at the power inlet that indicates the line voltage in volts and the current rating in amps.

Shoreline Inlet Location - Behind Driver's Door On Cab's Side

The Kussmaul Super Auto Eject Plug shall be located behind the driver's door on the cab's side.

Super Auto Eject Cover Color - Red

The Super Auto Eject Cover shall be red.

HEADLIGHTS

Front headlights shall be mounted on the front cab face to the left and right of the engine cooling intake grille. The headlights shall be quad type, rectangular HiViz FT-4X6, 12-volt LED with bright finished trim rings and chrome bezels. The low beam headlights shall be located at the outer position.

Hi-Viz LED headlights are provided with a lifetime warranty.

No Halo Activation - Whatsoever

The LED Halo shall not be activated at any time.

Headlight Position - Middle

The headlights shall be in the middle position.

FRONT DIRECTIONAL DUAL LIGHT BEZEL

The front directional lights shall be mounted in a chrome plated dual light bezel located on each side of the cab front face. The dual light bezel shall match the headlight housing.

Front Directional Light Bezels Position - Uppermost

The front directional light bezels shall be in the uppermost position.

Front Directional Lights

There shall be one (1) amber arrow directional signal light with colored lens installed on each side of the cab front face. The light lens shall have an amber arrow shape with black background and shall be provided with a "flash" pattern; a "sweep" pattern shall not be allowed.

Clearance Lights

Exterior cab lighting shall meet or exceed Federal Department of Transportation, Federal Motor Vehicle Safety Standards and any National Fire Protection Association requirements in effect at the time of proposal.

Five (5) Weldon 9186-1500-20, amber LED type (or equivalent) clearance and identification lights shall be surface mounted across the top leading edge of the cab roof.

Marker Lights

A TecNiq S34 amber LED marker light (or equivalent) with amber lens shall be recess mounted in a rubber sealing grommet placed in the lower front cab side, forward of the driver and officer door, on each side of the cab. The light body shall be urethane filled to ensure against moisture intrusion. These cowl mounted lights shall have 100,000 hour life and shall carry a manufacturers 10 year warranty.

Seven (7) TecNiq S34, red LED marker and clearance lights with red lens shall be installed at the rear of the body. The three light identification cluster shall be surface mounted on the rear step vertical flange. Two lights shall be placed at each lower rear body corner, facing the side. Two lights shall be placed in the upper rear body corners, facing the rear.

Turn/Marker Lights

One (1) Weldon 9186-8580-29 LED "bug-eye" (or equivalent) type turn/marker light shall be provided and installed horizontally on the rear fender panel below the forward air bottle compartment on each side of the vehicle. The lights shall have an amber polycarbonate lens and highly polished stainless steel mounting flange or bezel.

No License Plate Led Light & Bracket

D.O.T. Reflectors

Reflectors shall be placed on the cab and body as required by Federal standards. An amber reflector, Signal Stat, model 32ADB, shall be placed on each side of the cab. Four (4) Signal Stat model 32DB red reflectors shall be located on the rear face and sides of the body. The reflectors shall be rectangular in shape.

Cab Side Directional Lights

Side directional lights shall be provided in addition to the front turn signals. They shall be Weldon model 9186-8580-29, LED "bug eye" type. One (1) light shall be mounted just above the front fender on each side of the cab. Lights shall have an amber polycarbonate lens and highly polished stainless steel mounting flange or bezel.

Brake/Turn/Backup/Warning Lights Configuration

The brake, turn, backup and warning lights shall be located at the rear of the apparatus. Each light shall be mounted horizontally in a vertical configuration, one light atop the other.

The order of lights shall be as follows:
Top: Directional
Second from top: Brake
Third from top: Backup
Bottom: Warning

Stop-Turn-Back Up Lights

Two (2) Federal FireRay, red brake/taillights, with red outer lens, shall be mounted at the rear of the apparatus, one on each side. All brakes lights shall be programmed for "steady burn" operation in compliance with FMVSS No. 108.

Two (2) Federal FireRay amber arrow turn shall be mounted at the rear of the apparatus, one on each side. They shall be provided with a "flash" pattern; a "sweep" pattern shall not be allowed.

Two (2) Federal FireRay back up lights, shall be mounted at the rear of the apparatus, one on each side.

Bezels

Six (2) Federal FireRay bezels black mate in color shall be provided for the rear stop, turn, and backup lights.

Hose Bed/Storage Light

Four (4) TecNiq E10 LED light(s) (or equivalent) shall be installed at the front of the hose bed/storage area and shall illuminate the hose bed/storage area.

Front Hose Bed/Storage Light(S) Activate W Body Step Lights

The front hose bed/storage light(s) shall activate with the body step lights.

Light Activation

The cab step lights shall be activated with the cab door open switch.

The step lights on the body shall be activated with the parking brake in conjunction with the marker lights.

Cab Step Lights

Eight (8) TecNiq model EON, LED step lights (or equivalent) shall be provided, two (2) at each cab entrance door. They shall be mounted one (1) above and one (1) below each intermediate step.

Body Step Lights

Four (4) TecNiq Eon, LED horizontal step lights (or equivalent) with a polished stainless steel flange shall be surface mounted, one (1) on each side of the rear step area to illuminate the rear step and one (1) on each side on the forward face of the side compartments.

Light Activation

The cab ground lights shall be activated with the cab door open switch.

The ground lights on the body shall be activated with the parking brake in conjunction with the marker lights.

Ground Lights

Four (4) weatherproof TecNiq #E10 LED ground lights (or equivalent) shall be provided underneath the cab, per NFPA requirements.

Ground Lights

Two (2) weatherproof TecNiq #E10 LED ground lights (or equivalent) shall be provided underneath the body rear step, per NFPA requirements.

Ground Lights

Two (2) weatherproof TecNiq E10 LED ground lights (or equivalent) shall be provided underneath the pump enclosure, one each side, per NFPA requirements.

Engine Compartment Work Light

One (1) TecNiq E10 LED engine compartment work light (or equivalent) shall be provided and wired to illuminate automatically when the cab is tilted. The light shall also be wired through the engine compartment access door switch, providing illumination of fluid dip sticks and coolant overflow reservoir.

Pump Module Work Lights

Two (2) TecNiq E18-WCS0-1 LED lights (or equivalent) shall be installed, one (1) on the left side behind the master gauge panel and one (1) on the right side behind the hinged panel. Each light shall have a switch on it.

Pump Module Open Bin Work Light(S)

One (1) TecNiq E10 LED light(s) (or equivalent) shall be installed inside the open bin to illuminate the work area. The light(s) shall be mounted on the back wall of the open bin, high up in an area clear of open bin components such as a generator or reel. The light shall be switched with the pump panel lights.

Interior Cab Dome Lights

Four (4) Weldon 8086-6978-68 red/clear incandescent lights with push button shall be mounted in the cab ceiling. Two (2) in front (driver & officer) and two (2) in the crew cab. The red light shall be in the forward position. All lights shall be controlled by a switch by the lens.

Automatic Door Switches

Automatic door switches shall be provided for the cab dome lights. All white dome lights shall activate with any cab door opening.

CABDASH COURTESY LIGHTS

One (1) TecNiq E02 red LED courtesy light (or equivalent) shall be located under the cab dash on each side to illuminate foot switches. The light shall include a black flange. It shall activate with the marker light circuit.

Engine Compartment Light - Led Strip(S)

Seven (7) exterior compartment(s) shall have a ROM LED lighting strip (or equivalent) installed. The full height lighting

strip shall be mounted vertically along the right side of the door framing (standing outside, facing the inside of the compartment) in all specified body compartments. The LED lights shall be mounted in an anodized aluminum track. A switch, installed in the door frame, shall be used to activate light.

Specify which compartment(s) shall receive lighting:
LS1, LS2, LS3
RS1, RS2, RS3
Rear

Lightbar

A Federal Signal Navigator (Alsip FD specific Spec.) shall be provided on the cab roof.. The lightbar shall be mounted on a lightbar mount specifically for that lightbar provided by Federal Signal. The lightbar part number is NVG60D-1457557908

Upper Rear Beacon Lights

Two (2) Federal Signal SLR lights shall be provided on the upper rear of the apparatus. Both shall be red in color. The Federal part number is 262650-04.

Perimeter Warning Lights

Twelve (12) Federal Signal FireRay will be installed on the body. The lights shall be red in color and 6” x 4: in size. The flanges shall be black.

Warning Lights- Front of Engine

Two (2) Federal Signal FireRay lights shall be installed on the front of the fire apparatus in the same bezels as the headlights and turn signal lights. The right side shall be green and the left side shall be red. Both lights shall be 6” x 4”.

Flange - Black

The flange shall be black.

Standard Perimeter Warning Light Locations - Custom Apparatus

Location of each perimeter warning light shall be

Zone A Upper:
60" Front light bar

Zone A lower:
(2) Federal Signal FireRay red lights inboard of turn signals
(2) Federal Signal FireRay red lights located beneath headlights

Zone B/D lower:
(2) Federal Signal FireRay red lights on side of bumper
(2) Federal Signal FireRay red lights on side of cab, to rear of axle center, near crew door hinge
(2) Federal Signal FireRay red lights on body fender

Zone C upper:
(2) Rear beacons

Zone C lower:
(2) Federal Signal FireRay red lights below the backup lights
(2) Federal Signal FireRay red lights over T-light clusters up high

Audible Warning Devices

One (1) automotive electric horn controlled by the steering wheel horn button shall be provided.

Backup Alarm

One (1) Preco Model LDA-50 backup alarm shall be provided and activated when the vehicle transmission is placed in reverse. Alarm output shall be a minimum of 97 DBA.

Dual Air Horns

Two (2) Grover Stuttertone chrome air horns shall be furnished. A pressure protection valve shall be installed in-line to prevent loss of all air from the vehicle air brake system. The air horns shall range from 18" to 24" in length and shall be as long as possible, dependent upon other selected options and extension length.

Air Horn Locations - Both On Left Side Of Bumper

Both of the air horns shall be located on the left side of bumper

Air Horn Selector Switch

An air/electric horn selector switch shall be provided which will allow either the electric or air horn to be actuated by the horn button on the steering wheel.

Air Horn Foot Switch

One (1) Linemaster® Model 491 momentary foot operated switch(es) to activate the air horn(s) shall be installed on the cab floor.

Foot Switch Shall Not be Deactivated When Parking Brake is Set

The foot switch shall not be deactivated when the parking brake is set.

Foot Switch Location - Officer's Side, Inboard Position On Floor

The foot switch shall be located on the officer's side floor, inboard position.

Federal Siren

A Federal Signal model PA300 siren shall be provided. The siren has a selectable output of 100 or 200 Watts.

The siren head shall be wired battery switched. Auxiliary activation switches shall only be active when the emergency master and ignition are activated.

Electronic Siren Head Location - Upper Dash

The electronic siren head shall be located in the upper dash.

Mic Clip - Ship Loose

The siren mic clip shall be shipped loose.

Siren Speaker(S)

One (1) Federal Signal Model ES100 compact 100 watt speaker(s) shall be provided and recess mounted in the front bumper. Opening in the bumper for the speaker shall be covered with the manufacturer's logo on the grille.

One Speaker Location - Center of Bumper

The speaker shall be located in the center of the bumper.

Mechanical Siren

A Federal Signal Model Q2B-P-BLK siren with black plating housing shall be mounted on the front bumper extension as directed. The manufacturer shall also provide the Q2B-SWKIT solenoid and foot switch.

The siren activation switches shall only be active when the emergency master is activated.

Q2B® Siren Location - Left Side of Gravel Pan

The Federal Signal Q2B® siren shall be mounted on the left side of the gravel pan.

Mechanical Q2b® Foot Switch

One (1) Linemaster® Model 491 momentary foot operated switch(es) to activate the mechanical Q2B® siren shall be installed on the toe board of the cab floor.

Foot Switch Shall Be Deactivated When Parking Brake Is Set

The foot switch shall be deactivated when the parking brake is set.

Foot Switch Locations - Driver's Side OB & Officer's Side, OB Position On Floor

A foot switch shall be located on the driver's side, outboard of the steering column and on the officer's side floor, outboard position

Q2b Brake Rocker Switches

A siren brake rocker switch shall be installed in the cab, at the driver's side and officer's side switch panels, properly labeled.

Operator Stand

A 48” wide modular operator stand with side mount controls, shall be installed between the cab and the apparatus body.

The operator stand shall be independently mounted and furnished with flex joints between the cab and the body to allow for flexure of the chassis frame during road travel. (No exception to this requirement). The operator stand substructure shall be fabricated of 304 stainless steel structural shapes and formed
304 stainless steel plates and shall also support the side running boards. It shall be installed on the chassis with a four-point isolator arrangement that allows it to flex independently of the chassis frame. A Tech Products rubber isolator shall be used at each mounting point for this purpose. The substructure, including the pump and plumbing shall be removable from the vehicle as one complete unit. The aluminum ceiling of the operator stand shall be fastened with stainless steel machine screws so that it m a y be removed for access to the pump and piping as required.

Removable 304 stainless steel panels, full height and width, shall be provided on both sides of the operator stand and a stainless-steel pump access door shall be provided on each side of the vehicle. Each door shall be hinged along the top and held closed with compression latches or held open with two (2) gas struts.

OPERATOR STAND HEATER

A Red Dot model R-295 heater shall be provided in the pump compartment for use during freezing weather.
The heater shall be rated for 35,000 BTU/hr at 180 degrees air temperature rise. Fan air flow shall be 430 CFM.
The heater shall be controlled by a black rocker switch located on the pump operator's panel, set to maximum air flow.

Control Panel

All pump controls and gauges shall be located on the left side of the apparatus on a stainless-steel panel with color coded identification plates.

The following controls and gauges shall be located on the control panel for convenient operation:

- All discharge controls
- Electronic engine throttle or governor
- Primer control
- Tank fill control
- Tank to pump control
- Master discharge gauge
- Master intake gauge
- 1/4" NPT Allen head pressure and vacuum test plugs
- Auxiliary cooler control
- Master pump drain control
- Individual pressure gauges

Water level indicator

Crosslay Beds

There shall be Three (3) crosslay hose beds provided at the top front of the operator stand. The bottom of each crosslay shall be a maximum of 43" from the running board stepping surface. The front
(2) hose beds shall have the capacity to carry a minimum of 200 feet of pre-connected 1.75" double jacketed hose. The rearmost hose bed shall have the capacity to carry 200' of 2.5" hose. All hose will be single stacked and the combined width of the crosslays shall total 14.00 Inches.

The interior sides of the hose bed shall be constructed of 304 stainless steel and shall have a DA finish. The interior of the hose beds shall be smooth and free from all sharp projections which might damage hose.

Two (2) adjustable crosslay hose bed partitions (divider) shall be provided, constructed of 3/16" thick 5052-H32 aluminum alloy plate. They shall have a DA finish. The dividers shall be fully adjustable at each end of the hose bed. The dividers shall be held in place by two (2) bolts at each end of the partition's bottom flange.

The bottom of the crosslay hose beds shall be provided with a removable aluminum pan, with ventilation holes, for the stored hose. The pan shall be provided with a DA finish.

Open Bin

A 31.63" wide open bin area shall be provided aft of the crosslay beds. The outward facing walls shall be vented as necessary for equipment such as a generator or other device which requires air flow and is located within the open bin.

Open Bin Height - 15.75"

The walls surrounding the open bin shall be 15.75" high.

Operator Stand Exterior Finish

The pump panels, on both sides of vehicle and including the gauge panel and inspection doors, shall be coated with black LINE-X®, which has a high resistance to abrasion and tearing. The color shall be black. Panels with a black vinyl cloth glued or laminated in some process to a metal backing surface shall not be acceptable.

The LINE-X® material shall absorb impact without surface damage, protect underlying sheet metal from corrosion and shall be resistant to gasoline, diesel fuel, paints, bleaches, organic solvents and other cleaning agents and chemicals. In the unlikely event it is damaged, such as in an accident, it shall be repairable to a like new condition. It shall also be sound dampening and eliminate vibration. Its surface shall have a non-glare, granular texture, easily cleaned with common cleansing compounds.

Left Side Running Board

The left side running board shall be made of 3/16" aluminum tread plate. Two (2) supports shall extend from the operator stand framing to securely support the running board. The outer edges of the running boards shall be double-flanged, i.e. formed down and in.

An air space shall be provided between the aluminum running board, the body and the operator stand to prevent moisture and debris from being trapped between these components.

Right Side Running Board

The right-side running board shall be made of 3/16" aluminum tread plate. Two (2) supports shall extend from the operator stand framing to securely support the running board. The outer edges of the running boards shall be double-flanged, i.e. formed down and in.

An air space shall be provided between the aluminum running board, the body and the operator stand to prevent moisture and debris from being trapped between these components.

Pump Mount Bracket

A set of mounting brackets shall be used to mount the operator stand and the water pump as one complete module to the

apparatus chassis. This system shall be mounted at four points to the chassis frame and shall incorporate flexible isolators to absorb stresses from chassis twisting and vibrations.

Grab Rails

An 8" knurled aluminum grab rail shall be provided on the right and left side of the operator stand, next to the hinged access door on the side of the door next to the crosslay.

Pump Panel Label Color Chart

Color and verbiage shall be specified by customer utilizing the OEM color chart prior to the end of the order.

Innovative Controls warrants their pump panel labels for 25 years against discoloration and fading.

Pump Panel Lights

The driver's side of the operator stand shall have three (3) TecNiq E10 LED lights (or equivalent) located beneath light shields to illuminate the pump panel controls and gauges. The officer's side shall have one (1) TecNiq E10 LED light (or equivalent) beneath the light shield.

Pump Panel Light Activation

One (1) of the lights on the driver's side of the operator stand over the master gauge panel shall be activated when the pump is engaged.

Pump Panel Light Switch

A switch on the pump panel shall activate the pump panel lights not already activated by either the pump engaging or the marker/ground lights & parking brake combination.

Crosslay Cover

There shall be an aluminum cover for the crosslay. The cover shall be constructed of 3/16" aluminum tread plate and be hinged with a stainless-steel piano hinge. The cover shall be hinged at the front of the hose bed and shall be provided with a rubber bumper on each end to prevent cover from contacting the cab.

Crosslay End Flaps

A weighted lift-up cover shall be provided for the ends of the crosslay hose beds. The covers shall be made of 20 oz. per square yard polyester coated with a urethane topcoat (vinyl). The vinyl covers shall be permanently attached to the ATP cover and have stainless steel spring clips and stainless-steel hooks on the bottom corners.
This cover combination shall restrain the hose in the crosslay from unintentional deployment while the vehicle is underway in normal operations.

Vinyl End Flaps Cover Shall Be Red In Color

The vinyl end flaps cover shall be red in color. Color number of the vinyl is 705-1064.

Hold Open Device

A hold open device shall be installed on the crosslay aluminum tread plate cover.

Yellow Perimeter Line

In accordance with NFPA 1901 chapter 15.7.1.6, the perimeter of the cover shall be marked with a one-inch-wide safety yellow line to Delineate the designated standing or walking surface area.

Crosslay Discharges

A 2.5" discharge shall terminate in one of the hose beds. The 2.5" discharge shall be plumbed with 2.5" high pressure hose and/or piping, gated with a 2.5" valve and be equipped with a 2.5" swivel at the outlet. The other two beds shall each contain a 1.5" discharge, be plumbed with 2" high pressure hose and/or piping, gated with a 2" valve and equipped with 1.5" swivel at the outlet. The valve controls for the crosslays shall be installed on the pump operator's panel.

Waterous Pump

Pump shall be a Waterous CSU single stage 2000 GPM midship mounted centrifugal type, carefully designed in accordance with good modern practice. The pump shall be tested at the manufacturer's facility and certified by an independent testing organization.

Pump shall be NFPA 1901 current version compliant.

The pump shall be designed with a two-piece, horizontally split body with intake and discharge passageways in a single casting and on the same level.

The casing shall be two-piece, horizontally-split, high-tensile, close grained gray iron. All passageways shall be carefully matched to assure the very best hydraulic flow characteristics.

The wear rings shall be bronze, reverse-flow, labyrinth-type and replaceable.

The bronze impellers shall be balanced both mechanically and hydraulically for vibration-free operation. Flame plated impeller hubs shall be standard to assure longer life despite the presence of abrasives in the water supply.

The impeller shaft shall be heat-treated stainless steel that is ground at all critical areas and polished under packing. The two-piece design shall allow for separation of the transmission from the pump without disassembling either component.

Three deep-groove anti-friction ball bearings shall be located outside the pumping chamber to give support and proper alignment to the impeller shaft assembly. The bearings shall be oil or grease lubricated and shall be separate from the water being pumped. They shall be protected by seal housing, flinger rings and oil seals.

Flinger rings shall be located on the impeller shaft between the seal housing and bearing housing. They shall provide added protection and keep water and foreign matter out of the bearings.

Pump Transmission

The Waterous C20 pump transmission shall have high-strength, aluminum, three-piece, horizontally split housing and a high-strength involute form chain drive. It shall have a constant-mesh, two-position sliding collar that engages all teeth simultaneously with an internal locking mechanism to provide a positive lock in PUMP or ROAD position.

Mechanical Pump Seals

Mechanical pump seals shall be provided on the pump to eliminate the need for conventional packing rings.

Pump Shift

An air operated shift system shall be provided that allows the shift arm position to be changed by means of an in-cab mounted switch. It shall engage either the pump drive gear or the truck drive shaft gear. A three-position positive lock air shift shall be provided.

Intake Pressure Relief Valve

A 2-1/2" Waterous non-pilot operated intake relief valve shall be installed to the pump intake manifold. It shall have a minimum pressure adjustment of 50 to 250 PSIG. The surplus water shall be plumbed to the underside of the truck away from the operator.

Relief Valve Shall be Preset to 125 PSI

The relief valve shall be preset to 125 psi.

Priming Device

The Priming pump shall be a Waterous Model VPO electrically driven, positive displacement, rotary vane type. It shall operate without the use of sealing oil, i.e. be of oil-less design and not require an oil tank. Motor shall be totally enclosed to prevent dust, dirt and water from entering. The Priming pump shall be built by the manufacturer of the fire pump.

Priming Valve

Priming valve shall be operated by a push button control on the pump panel. Pushing the button shall automatically open the priming valve and activate the primer motor at the same time, thus being a one hand operation.

Primer Disconnect

There shall be a primer disconnect switch and fuse located behind the master gauge panel to disconnect power from the primer motor in the event the primer motor "hangs up".

Primer Push Button - Standard Size

The Waterous primer push button shall be standard size.

Pressure Governor And Monitoring Display

Fire Research Pump Boss PBA400 (or equivalent) series pressure governor and monitoring display kit shall be installed. The kit shall include a control module, intake pressure sensor, discharge pressure sensor, and cables. The control module case shall be waterproof and have dimensions not to exceed 6 3/4" high by 4 5/8". The control knob shall be 2" in diameter with no mechanical stops, have a serrated grip, and a red idle push button in the center. It shall not extend more than 1

3/4" from the front of the control module. Inputs for monitored information shall be from a J1939 data bus or independent sensors. Outputs for engine control shall be on the J1939 data bus or engine specific wiring.

following continuous displays shall be provided:

- Engine RPM; shown with four daylight bright LED digits more than 1/2" high
- Check engine and stop engine warning LEDs
- Engine oil pressure; shown on a dual color (green/red) LED bar graph display
- Engine coolant temperature; shown on a dual color (green/red) LED bar graph display
- Transmission Temperature: shown on a dual color (green/red) LED bar graph display
- Battery voltage; shown on a dual color (green/red) LED bar graph display
- Pressure and RPM operating mode LEDs
- Pressure / RPM setting; shown on a dot matrix message display
- Throttle ready LED.

A dot-matrix message display shall show diagnostic and warning messages as they occur. It shall show monitored apparatus information, stored data, and program options when selected by the operator. All LED intensity shall be automatically adjusted for day and nighttime operation.
The program shall store the accumulated operating hours for the pump and engine to be displayed with the push of a button. It shall monitor inputs and support audible and visual warning alarms for the following conditions:

- High Battery Voltage
- Low Battery Voltage (Engine Off)
- Low Battery Voltage (Engine Running)
- High Transmission Temperature
- Low Engine Oil Pressure
- High Engine Coolant Temperature
- Out of Water (visual alarm only)
- No Engine Response (visual alarm only).

The program features shall be accessed via push buttons located on the front of the control module. There shall be a USB port located at the rear of the control module to upload future firmware enhancements.

The governor shall operate in two control modes, pressure and RPM. No discharge pressure or engine RPM variation shall occur when switching between modes. A throttle ready LED shall light when the interlock signal is recognized. The governor shall start in pressure mode and set the engine RPM to idle. In pressure mode the governor shall automatically regulate the discharge pressure at the level set by the operator. In RPM mode the governor shall maintain the engine RPM at the level set by the operator except in the event of a discharge pressure increase. The governor shall limit a discharge pressure increase in RPM mode to a maximum of 30 PSI. Other safety features shall include recognition of no water conditions with an automatic programmed response and a push button to return the engine to idle.

The pressure governor and monitoring pressure display shall be programmed at installation for a specific engine.

Auxiliary Cooling System

A supplementary heat exchange cooling system shall be installed to permit use of water from the discharge side of the fire pump to reduce the temperature of the antifreeze solution circulating through the engine cooling system.

Waterous Warranty

The pump shall be warranted by Waterous to the original buyer that the pump is free from defects in material and workmanship under normal use and service for a period of seven (7) years from the date the product is first placed in service, or seven and one-half (7-1/2) years from the date of shipment by Waterous, whichever period shall be the first to expire; provided the Buyer notifies Waterous, in writing, of the defect in said product within the warranty period, and said product is found by Waterous to be nonconforming with the aforesaid warranty. This warranty covers parts only. See warranty certificate for complete details.

Pump Anti-Corrosion System

An anti-corrosion system shall be installed to prevent galvanic corrosion within the pump. It shall consist of two (2) sacrificial magnesium anodes. One shall be installed on each of the 6" main inlets. Anodes shall be easily removable for inspection and replacement.

Transmission Lock Up

The direct gear transmission lockup for the fire pump operation shall engage when the pump shift control in the cab is activated and the transmission shift is changed to “Drive”.

Pump Piping –Stainless Steel, Manifold And High Pressure Hose

All suction and discharge lines shall use schedule 10 stainless steel pipe or heavy-duty pressure/vacuum hose with stainless steel end fittings. Sweat soldered copper tubing is not acceptable. Where vibration or chassis flexing may damage or loosen piping, the pipe shall be equipped with Victaulic or rubber couplings. All discharge and gated inlet lines to drain through individual drain valves. All individual drain lines are to be extended to drain below chassis frame.

A stainless-steel discharge manifold shall be used to feed the discharges, 2-1/2” or less, as required by the plumbing layout.

All discharge caps on the apparatus 1-1/2” or larger shall be vented (except for the aerial rear inlet/outlet).

All threaded fittings shall be sealed with a heavy-duty Teflon anaerobic pipe sealant. It shall be in a liquid form with a consistency similar to grease. Teflon tape shall not be acceptable. It shall be designed to prevent corrosion between the mating surfaces and to allow for easy disassembly of the joints if necessary. Permabond shall manufacture with a trade name of Permablock.

All water carrying pressure gauge lines are to be of flexible tubing to prevent breakage from vibration. All suction inlets and discharge outlets shall be equipped with National Standard Threads (NST).
The entire pump and plumbing system shall be tested in accordance with the current version of NFPA 1901.

Master Drain - Fire Pump

A master drain valve shall be provided and installed. The drain assembly shall be constructed of brass and stainless steel with individually sealed ports for low point drainage of the fire pump and auxiliary devices.

Drains

An Innovative Controls 3/4" quarter turn ball drain or bleed off valve with a chrome plated lifting stroke lever arm shall be

provided for each gated hydrant inlet or discharge outlet located on the driver side and passenger side pump panels. The valve shall be mounted in an accessible location and shall incorporate a lifting ergonomic grip with color coded labels. The water discharged from the valve lines shall be routed so it is exhausted below the chassis frame rails, with the discharge pointed toward the ground.

All remaining drains or bleed off valves located in areas other than the driver side and passenger side pump panels, such as front suction drains located under the cab, shall be Class 1 3/4" quarter turn ball drain with a rectangular handle and shall be properly labeled.

Tank To Pump Line

A 3" tank to pump valve shall be installed between the water tank and the pump. The valve shall be a quarter turn ball type, drop out design and constructed of brass. The control handle shall be chrome push/pull locking "T" type and will be installed on the left side pump panel. A check valve shall be installed between the pump and the valve to prevent water from flowing back into the tank.

Inlet And Outlet Push Pull Controls

Controls for all inlets and outlets shall be push-pull in design, unless otherwise stated at the inlet or discharge option. All inlet and outlet push-pull valve control handles shall be the "T" handle design with a recess in its face for a 7/8" x 2-7/8" identification plate. Handles and panel plates (escutcheons) shall be constructed of cast zinc with a polished chrome plated finish. Handles shall be labeled describing the function of the control handle. The discharge valves that are remote mounted in the pump system piping shall be actuated by the 1/4 turn locking push-pull control assembly. The sliding rod for the outlet which pulls out from the pump panel shall be constructed of 3/4" diameter aluminum with a hard coated anodized surface. The aluminum housing shall incorporate two bronze bushing sleeves. Inlet valve controls do not have to be locking type nor have the control rod. All controls shall actuate without binding, according to the manufacturer's requirements.

Akron Valves

All direct and in-line valves shall be Akron model 8600 or 8800 heavy duty swing-out brass valves designed for operating pressures to 250 PSI. Akron 8000 series valves have a 316 stainless steel ball turning in self-adjusting ball seats and shall create a positive seal to hold pressure or vacuum in both directions without the use of high maintenance O-rings.
If electric valves are chosen, the controller shall be model 9327.

Warranty

Akron Brass warrants the 8600 and 8800 heavy duty valves for a period of ten (10) years after purchase against defects in materials or workmanship. See warranty certificate for complete details.

Master Gauges

A pair of Ashcroft compound gauges shall be provided for the master Pump Intake and master Pump Discharge gauges. The gauges shall be 6" in diameter and have a pressure range of 30-0-400 and shall dampen vibration and pulsation. The gauges shall be the dry type for optimal performance in freezing temperatures. The gauge body and bezel shall be stainless steel construction with black lettering on white faces. The gauges shall each have an adjustable pointer and a vent hole to assist with condensation.

The master gauges shall be grouped together on the pump operator's control panel for ease of observation during pump

operations, as required by NFPA 1901.

Warranty

The Ashcroft gauge(s) shall have a five (5) year manufacturer's warranty. See warranty certificate for complete details.

Pressure Gauge(S)

Seven (7) individual line pressure gauges for the 1.50" and larger discharges shall be furnished. The gauge(s) shall be 3.5" in diameter and have a pressure range of 30-0-400 and shall dampen vibration and pulsation. Each gauge shall be the dry type for optimal performance in freezing temperatures. The gauge body and bezel shall be stainless steel construction with black lettering on white faces. Each gauge have an adjustable pointer and a vent hole to assist with condensation.

Warranty

The Ashcroft gauge(s) shall have a five (5) year manufacturer's warranty. See warranty certificate for complete details.

Pressure Gauge/Flow Meter(S)

Two (2) waterproof dual pressure and flow meter combination gauges(s), model FPA-400-X, manufactured by Fire Research shall be installed and will display pressure and flow readings simultaneously. Devices that require user intervention such as pushing buttons to change the mode from pressure to flow will not be acceptable. Sensors that transmit the pressure and flow data shall be separate and independent. The sensor used to measure flow shall be of the paddlewheel design. The paddlewheel shall be proved in fire service applications with a minimum of 1000 units in service over 5 years. The magnets shall not be mounted on the paddles. The 0.4" high (minimum) flow meter display shall be "daylight bright" LED, visible even in direct sunlight. The pressure display shall be needle type with 250- d e g r e e electric movement.

Discharges receiving flow meters shall be: LDH & Deluge

Color-Coded Bezel(S)

A color-coded bezel shall be provided on two (2) Fire Research FPA-400-X pressure gauge(s). Each gauge is to match the color of the discharge.

Factory Flowmeter Calibration

The flowmeter shall be calibrated at the factory, prior to the apparatus being shipped

Air Horn Rocker Switch

A red momentary rocker switch shall be provided on the operator's pump panel to activate the air horn(s).

Water Tank Level Gauge - Master

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

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

The program features shall be accessed from the front of the indicator module. The program shall support self-diagnostics capabilities, self-calibration, six (6) programmable colored light patterns to display tank volume, adjustable brightness control levels and a data link to connect remote indicators. Low water warnings shall include flashing LEDs at 1/4 tank, down chasing LEDs when the tank is almost empty, and an output for an audio alarm.
The indicator shall receive an input signal from an electronic pressure sensor. The sensor shall be mounted from the outside of the water tank near the bottom. No probe shall be placed on the interior of the tank. Wiring shall be weather resistant and have automotive type plug-in connectors.

The lights shall be interlocked with the parking brake to operate only with the parking brake set.

Large Water Tank Level Displays

Two (2) FRC Max Vision remote water tank level display(s) shall be provided on the cab, one on each side of the cab. The displays shall be vertically mounted and wired to the Master water tank level gauge. The display shall activate when the maxi parking brake is activated.

The lights shall be interlocked with the parking brake to operate only with the parking brake set.

Large Tank Level Display Location - Centered On Crew Cab Extension

Lights shall be mounted behind the crew cab door each side, up high, centered on the cab extension. Additional selected options may affect the exact placement of the light.

Additional Large Water Tank Level Display

One (1) FRC Max Vision water tank level display(s) shall be provided on the Front of the cab running horizontal centered beneath the windshield just above the front cab grill. The displays shall be

One (1) FRC Max Vision water tank level display(s) shall be provided on the rear of the vehicle. Location to be discussed during the pre-construction meeting. The displays shall be vertically mounted and wired to the Master water tank level gauge.
The display shall activate when the maxi parking brake is activated.

The lights shall be interlocked with the parking brake to operate only with the parking brake set.

FRC Foam Tank Level Gauge(S)

One (1) Fire Research Tank Vision Pro 300 foam tank level gauge(s) shall be supplied and mounted in a well-lit area on the pump panel. The indicator shall show the volume of foam in the tank on nine (9) easy to see super bright RGB LEDs. A wide view lens over the LEDs shall provide for a viewing angle of 180 degrees. The indicator case shall be waterproof, manufactured of Polycarbonate/Nylon material, and have a distinctive label: green for class A foam and yellow for class B foam.
The program features shall be accessed from the front of the indicator module. The program shall support self-diagnostics capabilities, self-calibration, six (6) programmable colored light patterns to display tank volume, adjustable brightness control levels and a datalink to connect remote indicators. Low foam warnings shall include flashing LEDs at 1/4 tank,

down chasing LEDs when the tank is almost empty, and an output for an audio alarm.

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

The lights shall be interlocked with the parking brake to operate only with the parking brake set.

Foam Tank Level Gauge Labeled - Foam Tank B

The foam tank level gauge shall be labeled: Foam Tank B.

Pump Inlets

A 6" pump manifold inlet shall be provided on each side of the vehicle. Removable die cast zinc strainers shall be provided in each side inlet to provide cathodic protection for the pump and thus reduce corrosion in the pump. Each inlet shall extend past the pump panel and shall allow a minimum of 8" clearance to the outside edge of the running board.

Main Pump Inlet Storz Adapter(S)

Two (2) 6" FNST x 5" Storz hard anodized aluminum adapter(s) w/ 30-degree bend shall be provided for the 6" main pump inlet(s).

Main Pump Inlet Cap(S)

Two (2) 5" Storz hard anodized aluminum cap(s) and cable(s) shall be provided for the main pump inlet(s).

Monarch Intake Valve Package(S) - Handwheel Control

Two (2) Waterous Monarch Intake Valve package(s) shall be provided. This package includes an intake butterfly valve with integral relief valve, designed to fit behind the pump panel. The Waterous Monarch package features a Jamesbury Wafer-Sphere high performance butterfly valve. The Monarch package shall feature a manual worm gear actuator with handwheel control. The control shall be located on same side panel of the pump house as the Intake Valve. A Waterous non-pilot pressure relief valve shall be provided that is field adjustable from 75 to 250 PSI. The pressure relief valve shall provide overpressure protection for the suction hose even when the intake valve is closed. The outlet of the pressure relief valve shall discharge flow away from the pump operator's position.

Relief Valve Shall Be Preset To 125 PSI

The relief valve shall be preset to 125 psi.

Master Intake Valve Locations - Left & Right Side

A master intake valve shall be located on both the left and right sides.

2-1/2" Hydrant Inlet(S)

One (1) 2-1/2" gated hydrant inlet(s) shall be furnished on the left side of the pump enclosure. The valve shall be recessed behind the panel and shall be provided with a swing valve control extending through the panel. The valve shall be of the dropout type. Inlet shall terminate with a 2-1/2" NST female swivel adapter and screen.

Left Side Auxiliary Gated Inlet Plug(S)

One (1) 2.5" NST chrome plated plug(s) and retaining chain(s) shall be provided for the left side 2.5" auxiliary gated inlet(s).

2-1/2 Hydrant Inlet(S)

One (1) 2-1/2" gated hydrant inlet(s) shall be furnished on the right side of the pump enclosure. The valve shall be recessed behind the panel and shall be provided with a swing valve control extending through the panel. The valve shall be of the dropout type. Inlet shall terminate with a 2-1/2" NST female swivel adapter and screen.

Right Side Auxiliary Gated Inlet Plug(S)

One (1) 2.5" NST chrome plated plug(s) and retaining chain(s) shall be provided for the right side 2.5" auxiliary gated inlet(s).

Tank Fill

There shall be a 1-1/2" pump to tank fill line installed with a 1-1/2" inline valve. Valves shall be controlled at the pump panel with a chrome locking handle.

Front Bumper Discharge

One (1) 2.5" pre-connect discharge shall be located in the front bumper extension. The discharge shall be plumbed from the pump with 2.5" plumbing. It shall have a 2.5" manual full flow quarter turn valve with push/pull control. The discharge shall end in a chrome plated 90-degree swivel elbow.

Front Bumper Discharge Location - B: Right Inside Position

The discharge shall be located on the bumper in the right inside (B) position.

Swivel Stop

A U-shaped, polished rod swivel stop shall be provided for the front bumper discharge swivel. It shall prevent the swivel from rotating to the rear where it can come into contact with the cab during tilting operations.

No Cap & Chain For Front Bumper Discharge

2-1/2" Left Side Discharge(S)

One (1) 2 1/2" discharge(s), each with a pump mounted, quarter turn ball valve shall be located on the left side panel. Each valve shall be capable of being locked or unlocked at the valve from the control panel at any position between open or closed and shall operate freely up to maximum pump discharge pressure.

Left Side Discharge Adapter(S)

One (1) 2.5" FNPT x 2.5" MNST chrome plated adapter(s) shall be provided for the 2.5" left side discharge(s).

Left Side Discharge Elbow(s)

One (1) 2.5" FNST x 2.5" MNST 45-degree chrome plated elbow(s) shall be provided for the 2.5" left side discharge(s).

Left Side Discharge Cap(S) & Chain(S)

One (1) 2.5" chrome plated cap(s) and retaining chain(s) shall be provided for the 2.5" left side discharge(s).

2-1/2" Right Side Discharge(S)

One (1) 2 1/2" discharge(s), each with pump mounted, quarter turn ball valve shall be located on the right- s i d e panel. Each valve shall be capable of being locked or unlocked at the valve from the control panel at any position between open or closed and shall operate freely up to maximum pump discharge pressure.
The valve shall be operated from the operator's panel.

Right Side Discharge Adapter(S)

One (1) 2.5" FNPT x 2.5" MNST chrome-plated adapter(s) shall be provided for the 2.5" right side discharge(s).

Right Side Discharge Elbow(S)

One (1) 2.5" FNST x 2.5" MNST 45-degree chrome plated elbow(s) shall be provided for the 2.5" right side discharge(s).

Right Side Discharge Cap(S) & Chain(S)

One (1) 2.5" chrome plated cap(s) and retaining chain(s) shall be provided for the right side discharge(s).

4" Right Side Discharge

There shall be one (1) 4" discharge to the right-side pump panel. The outlet shall be piped from the discharge side of the pump through a 4" handwheel controlled valve with 4" piping. The valve shall be pump panel controlled.

Right Side Discharge Adapter(S)

One (1) 4" FNPT x 5" MNST chrome plated adapter(s) shall be provided for the 4" right side discharge(s).

Right Side Discharge Elbow(S)

One (1) 5" FNST x 5" Storz 30 degree hard anodized aluminum elbow(s) shall be provided for the 4" right side

discharge(s).

Right Side Discharge Cap(S) & Chain(S)

One (1) 5" Storz cap(s) and retaining chain(s) shall be provided for the right-side discharge(s). The Storz cap(s) shall have a hard anodized finish.

2-1/2" Left Rear Discharge(S)

One (1) 2-1/2" discharge(s) shall be provided at the rear of the hose bed on the left-hand side. It shall be plumbed with 2-1/2" pipe. The outlet(s) shall be operated by an in-line 2-1/2" drop out type valve with control at the pump panel.

Left Side Rear Discharge Adapter(S)

One (1) 2.5" FNPT x 2.5" MNST chrome plated adapter(s) shall be provided for the 2.5" left side rear discharge(s).

Left Side Rear Discharge Elbow(S)

One (1) 2.5" FNST x 2.5" MNST 45 degree chrome plated elbow(s) shall be provided for the 2.5" left side rear discharge(s).

Left Side Rear Discharge Cap(S) & Chain(S)

One (1) 2.5" chrome x (1) 1.5” MNST adapter and plated cap and retaining chain shall be provided for the left side rear discharge.

3" Deluge Riser W/ Electric Control

A 3" deluge gun riser shall be installed above the pump terminating in the open bin with National Pipe Thread (NPT). Location to be determined on the P. E. Drawing and approved by the customer. Piping shall be installed securely so no movement develops when the line is charged. The riser shall be gated and controlled at the pump operator panel by an electric valve. The outlet shall be piped from the discharge manifold of the pump through 3" piping. An open/closed indicator light module and pressure gauge shall be provided on the pump panel.
Piping shall terminate above the pump housing floor approximately 20.50"

There shall be a remote slave control in the open bin area in close proximity to the monitor to allow a user in the open bin to close the valve

Deck Gun

One (1) Elkhart Model 8297, part number 81270002, Stinger® 2.0 portable monitor shall be installed on the deck gun discharge. The lightweight Elk-O-Lite® deck gun shall have a 3-3/8" diameter vaned waterway for flows up to 1000 GPM with minimal friction loss and superior stream quality.

The monitor shall have a handwheel driven, stainless steel vertical worm gear that shall be fully enclosed and protected from weather and intrusion from other elements. The deck gun shall be capable of vertical travel from 35 degrees to 75 degrees above horizontal. The gun shall be capable of 360-degree travel with a positive twist lock for secure positioning.

The monitor shall be equipped with a carrying handle that shall also act as a quick release mechanism. The unit shall have a Zerk grease fitting for ease of lubrication. The monitor shall be equipped with a 0-200 PSI liquid filled pressure gauge with protective guard and a 2-1/2" NH male outlet.

Stream Shaper

One (1) Elkhart Model #282-A, part number 03476001, stream shaper shall be provided. The stream shaper shall have replaceable vanes with a 2-1/2" NH female inlet and outlet. The unit shall be constructed from Elk-O-Lite® alloy.

Deluge Tip Set

One (1) Elkhart Model #ST-194, part number 00626001, quad stacked deluge tip set shall be provided. This set shall have four (4) tips of the following sizes:

- 1-3/8" discharge with a 1-1/2" NH female base
- 1-1/2" discharge with a 1-1/2" Underwriters female base
- 1-3/4" discharge with a 2" NH female base
- 2" discharge with a 2-1/2" NH female base

The tips shall be constructed from Elk-O-Lite® alloy.

Portable Ground Base

One (1) portable base (part #80927101) shall be supplied and shipped loose. The forged aluminum legs with self-adjusting ground spikes shall lock in place for deployment and fold for compact storage. The portable base shall have one (1) 5” free swivel locking Storz inlet. The unit shall be equipped with a 10' safety chain.

Monitor Color - Elkhart Red

The monitor shall be Elkhart Red in color and have Elk-O-Lite® hard anodized trim.

Stacked Tip Set

One (1) Elkhart Brass model ST-194 set of quad stacked tips with an Elk-O-Lite® finish shall be provided. They shall have a 2.5” NH slotted female inlet, 2”, 1-3/4”, and 1-1/2” 1-3/8” orifices and shall not exceed 12.875” in length or 2.125” lbs. in weight.

STREAM SHAPER

One (1) Elkhart Brass model 282-A, Elk-O-Lite® steam shaper shall be supplied. The shaper shall have a 2.5” inlet, a 2.5” outlet and be 4.5” long.

3" Asa Deck Gun Flange

A 3" 4-bolt ASA flange shall be furnished and installed on the end of the deluge riser.

Foam Pro 2002 Foam Proportioning System For Class "A" Or "B" Foam

A Foam Pro 2002 direct injection foam system capable of flowing 1000 GPM of 0.5% concentration, 500 GPM of 1.0% concentration and 166 GPM of 3% concentration shall be provided.

Foam System to be wired to pump lock up function

The foam system shall be capable of discharging either Class A or B foam.

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

Push button control for the foam proportioning rate shall allow a ratio from .1% to 3.0% in 0.1% increments. The rated capacity of the system shall be 166 GPM at 3.00% and 1000 GPM at 0.5%.

Foam injection pump shall be rated 5.0 GPM and be the positive displacement type powered by a 12-volt DC electric motor.

A check valve shall be installed between the water pump and foam injection point to prevent foam agent from contaminating the water pump. Also, a check valve shall be placed between the foam pump and

injection point to prevent water flowing into the foam pump and foam tanks.

After the flow meter and the foam injection point the discharge shall be split to feed four (4) different outlets. Depending on the number of discharges utilized, nozzle flow rates selected and foam agent percentage, all outlets may not be able to be used simultaneously at rated water or foam flows (see foam capacities stated above) nor can one outlet (of the four) discharge water and another foam while the system is in operation.

Foam Capable Discharges

The following discharges, if present, shall be foam outlets when a direct injection foam system has been installed: 1, 2 & 3 crosslays/speedlays and front bumper discharge.

Additional Foam Outlet Location - 2-1/2" Rear Left Side Discharge

An additional foam outlet shall be located at the 2-1/2" rear left side discharge.

Foam Proportioning System Testing

The foam proportioning system accuracy shall be tested using method 2 of section A.20.10.1 as specified in NFPA 1901, current edition: "Measuring Foam Concentrate Pump Output Directly". With the foam system operating at a given water flow rate, and water used as a substitute for foam concentrate, the output of the foam concentrate pump shall be measured by diverting that output into a calibrated container for direct measurement over a measured period of time. An alternative is to measure the water substitute with a calibrated meter.

The contractors' report shall contain the following information for each foam tested:

TANK A

- Set Ratio:
- % and Flow Rate:
- GPM to determine Foam Quantity:
- Determine Gallons consumed for Run Time:
- Actual Mixing Ratio:
- % Lower Control Limit:
- % Upper Control Limit:
- The mixing ratio shall fall within the NFPA specification for accuracy:_____Yes _ No_

TANK B

- Set Ratio:
- % and Flow Rate:
- GPM to determine Foam Quantity:
- Determine Gallons consumed for Run Time:
- Actual Mixing Ratio:
- % Lower Control Limit:
- % Upper Control Limit:
- The mixing ratio shall fall within the NFPA specification for accuracy:_____Yes _ No

Foam Pro Power Fill System

A Foam Pro Power Fill system for a single tank shall be installed. The system shall include apparatus mounted electric motor and pump and panel mounted control plates. The Power Fill system, an electronically controlled, pre-plumbed concentrate refill system, shall have a fill rate of 10 gallons per minute. The system's non-corrosive pump, with high drafting capabilities, shall be compatible with all concentrations and viscosities currently used.

Components of the complete refill system shall include:

- Operator control and display with Weather-Pac connectors
- Refill/flush quick-connect cam-lock fittings and cap
- Check valves
- Pump/motor assembly and solenoid
- Strainer
- Tank level switch
- Three-way fill/flush valve
- Stainless steel pickup wand and 6 feet of reinforced suction hose, 1" in diameter to allow maximum flow
- Panel placards

T- Half Type Water Tank

A HALF T-shaped polypropylene water tank shall be supplied. It shall have a capacity of 750 U.S. gallons and shall be constructed per the manufacturer's specifications.

Tank Manufacturer - United Plastic Fabricating (UPF)

The tank shall be manufactured by United Plastic Fabricating (UPF).

Water Tank Fill Tower

The United Plastic Fabricating (UPF) tank shall have a combination vent and manual fill tower. The polypropylene fill tower shall have a minimum dimension of 8" x 8" outer perimeter. (Standard size shall be 12.00" x 12.00"). The fill tower shall be not less than 12.00" high and shall be flush with the top of the body risers as WATER standard. The fill tower shall be blue in color, indicating that it is a water-only fill tower. The tower shall be located in the left front corner of the tank unless otherwise specified by the tank manufacturer to the purchaser. The tower shall have a removable polypropylene screen and a polypropylene hinged cover. The capacity of the tank shall be engraved on the top of the fill tower lid.

Inside the fill tower there shall be a combination vent/overflow pipe. The vent overflow shall be a minimum of schedule 40 polypropylene pipe with a minimum I. D. of 4" that is designed to run through the tank and shall be piped to discharge water behind the rear wheels as required in NFPA 1901 so as to not interfere with rear tire traction.

Warranty

The tank manufacturer, United Plastic Fabricating, shall provide a limited lifetime warranty. See warranty certificate for complete details.

Water Tank Cradle

The tank shall rest on stainless steel cross members in conjunction with such additional cross-members, spaced at a distance that would not allow for more than 530 square inches of unsupported area under the tank floor. In cases where overall height of the tank exceeds 40 inches, cross-member spacing shall be decreased to allow for not more than 400 square inches of unsupported area. The tank shall be isolated from the cross members using hard rubber strips with a minimum thickness and width dimension of .250" x 2.00" and a minimum Rockwell Hardness of 60 durometer. Additionally, the tank shall be supported around the entire bottom outside perimeter and captured both front and rear as well as side to prevent the tank from shifting during vehicle operation. Although the tank is designed on a free-floating suspension principle, the tank shall have adequate hold down restraints to minimize movement during vehicle operation. If proper retention is not available or incorporated into the apparatus hose floor, an optional mounting restraint system shall be located on top of tank, halfway
between the front and the rear on each side of the tank. These stops shall be constructed of stainless steel having minimum angular dimensions of 3.00" x 3.00" x .250" and shall be approximately 6.00" to 12.00" long. These brackets shall incorporate a hard rubber isolating pad with a minimum thickness of .250" affixed on the underside of the angle. The angle shall then be bolted to the body sidewalls of the vehicle while extending down to rest on the top outside edge of the upper sidewall of the tank. Internal mounting block design and hose bed floors shall be so designed that the floor slat supports extend full width from side wall to side wall and are not permitted to drop off the edge of the tank or in any way come in contact with the individual covers where a puncture could occur. Hose floor loading shall support up to 200 lbs.

per sq. foot and shall be evenly distributed whenever possible. Other equipment such as generators, portable pumps, etc. shall not be mounted directly to the tank top.

Vent Overflow Pipe-Hose Extension

Rubber hose shall be connected to the vent overflow pipe on the lower portion of the water tank. This hose shall direct any overflowing water behind the rear axle of the apparatus.

When the water tank has one or more of the following: dump chute(s), large tank fill or multiple tank fill(s), the vent overflow pipe shall not be provided, as this causes the vent overflow pipe size to increase.

Foam Tank

A forty (40) gallon "B" foam tank shall be incorporated into the water tank. These 40 gallons shall be in addition to the specified amount of water. It shall be built by the same manufacturer as the water tank, and per the manufacturer's specifications.

Foam Fill Tower

The foam fill tower shall be a minimum dimension of 8" x 8" outer perimeter (standard size to be 12" x 12"). The fill tower shall be provided with an easy opening, hinged, latching cover. Within the fill tower there shall be an anti-foaming fill pipe. The fill tower shall be constructed to facilitate complete interior flushing as required. The fill tower shall be equipped with a pressure/vacuum vent that enables the tank to compensate for changes in pressure or vacuum when filling or withdrawing foam concentrate.

If the tank manufacturer is United Plastics Fabricating, the foam fill tower shall be yellow in color. If the tank manufacturer is Pro Poly of America, then the fill tower shall be black in color.

Tank Drain

A two (2) inch tank drain shall be provided at the tank sump. The drain shall incorporate a two (2) inch ball type valve with control extended to under the LS1 body compartment.

155" Overall Body Length

The overall length of the body shall be 155". The distance from the front exterior edge of the body to the midline of the rear axle shall be 70.5". Body overall width shall be 98", fender to fender. (if length cannot be met, the bidder shall specify their overall body length and reason why they cannot meet the spec.)

Body Construction

The body and compartments construction materials shall be specified by the bidder. The body shall be welded on external or hidden surfaces wherever possible to ensure a clean compartment interior look.
The compartments shall be a "sweep out" design with the floor higher than the door sill. All compartment seams shall be caulked with gray adhesive/sealant. Each compartment shall be rated for 500 lbs. of storage. False bulkhead panels shall be provided on the inside of the forward and rearward wall of the side compartment panel to cover and protect all electrical wiring and components. This also provides a clean interior for equipment mounting. These panels shall be removable. Removable service panels shall be placed within each of the false bulkhead panels. Door frames on compartments with hinged doors shall be fabricated by flanging the door opening edges inward 1.88" and bending out again .75" to form an angle. The hose body side panels and partitions shall be raised in 5" increments to provide adequate storage for the required and specified hose load.

A bright aluminum tread plate cover shall be installed over the side compartments. The cover shall not form the compartment top but shall be an overlay. The forward and rearward edges of the cover shall be folded down 1.5" to cap the forward and rearward ends of the side compartment panel. The outside edge of the cover shall be folded down 1.5" to cap the outside of the side compartment panel and shall have a 45-degree outward bend to provide drip protection over any compartment doors which are immediately below the cover. This aluminum tread plate cover shall not be provided when rooftop compartments are present.

Extruded aluminum drip molding with a bright anodized finish shall provide drip protection for any compartment doors that are not directly below an aluminum tread plate cover. The forward face of the side compartments and the face of the

front cross panel above the operator stand shall be covered with a bright aluminum tread plate overlay. All body components covered with aluminum tread plate overlays shall be coated with an anti-corrosion compound prior to installation. All tread plates shall be secured with threaded fasteners.

Fender compartments shall be integral with the body side compartmentation. There shall be no sharp objects protruding into the wheel well area that could cause injury while cleaning or doing other maintenance in this area.

Fama26 No-Step Sign

In accordance with NFPA 1901 chapter 15.7.1.6, a FAMA26 "No-Step" sign shall be located on the front and rear of the body roof. The sign reads: "Fall Hazard Railings NOT provided. Surface may be slippery
- Not intended for stepping, standing or walking. Fall will injure or kill"

Body Mounting Substructure

The front portion of the right- and left-hand side compartments shall mount to a front cross panel. The panel shall be constructed of tubing and heavy-duty sheet metal. The front cross panel assembly shall rest on two (2) heavy duty rubber isolators. These isolators shall be bolted to brackets mounted to the chassis frame, as close to the center line of the chassis frame as possible. This center mounted isolators shall provide a pivot point which shall allow chassis movement without introducing stress into the body. The rear portion of each side compartment shall bolt directly to the rear step support assembly, which is bolted directly to the chassis frame. The rear steel step/body support assembly shall be constructed of formed .25" and .375" plate, 2" X 3" tubes, 2" X 2" angles, and 3" structural channels in a welded assembly. The rear wall shall be reinforced with formed heavy duty panels.

The compartment sizes shall be as follows:

Left Side Compartments

The full height left hand side panel at 155.00" long by 70.00" high. This panel consists of one (1) full height compartment ahead of the rear wheels, one (1) full height compartment behind the rear wheels, and one (1) upper compartment above the rear wheels. The compartment behind the rear wheels has a 25.75" wide x 29.75" high transverse area through the rear tailboard compartment. It also has extended compartmentation in place of standard beavertail. This extended area is half depth in the upper area and full depth in the lower area. All compartments shall have roll-up style doors.

The full-height compartment ahead of the rear wheels shall have a doorframe-to-doorframe dimension of 37.50" wide x 63.75" high. The clear door opening shall be 36.00" wide x 57.50" high. The usable compartment space for the full depth area shall be 37.50" wide x 29.75" high x 26.50" deep and the area under the roll shall be 37.50" wide x 27.75" high x 12.50" deep. This compartment shall have an aluminum shutter type roll-up door.

The full height compartment behind the rear wheels shall have a doorframe-to-door frame dimension of 47.50" wide x 63.75" high. The clear door opening shall be 46.00" wide x 57.50" high. The usable compartment space for the full depth area shall be 47.50" wide x 29.75" high x 26.50" deep and the area under the roll shall be 47.50" wide x 27.75" high x 12.50" deep. This compartment shall have an aluminum shutter type roll-up door.

The upper compartment above the rear wheels shall have a doorframe-to-door frame dimension of 58.00" wide x 30.50" high. The clear door opening shall be 56.50" wide x 25.25" high. The usable compartment space shall be 63.38" wide x 26.25" high x 12.50" deep. This compartment shall have an aluminum shutter type roll-up door.

Right Side Compartments

The full height right hand side panel at 155.00" long by 70.00" high. This panel consists of one (1) full height compartment ahead of the rear wheels, one (1) full height compartment behind the rear wheels, and one (1) upper compartment above the rear wheels. All compartments shall be rescuing style with a ladder compartment running full length through the body. This area will accommodate ladder-nesting combinations of 11.00" wide x 31.00" high x 171.00" long. There shall be a vertically hinged door on the rear face of the body to access the ladder compartment. The compartment behind the rear wheels has a 25.75" wide x 29.75" high transverse area through the rear tailboard compartment. All compartments shall have roll-up style doors.

The full-height compartment ahead of the rear wheels shall have a doorframe-to-doorframe dimension of 37.50" wide x 63.75" high. The clear door opening shall be 36.00" wide x 57.50" high. The usable compartment space for the full depth area shall be 37.50" wide x 33.00" high x 26.50" deep and the area under the roll shall be 37.50" wide x 24.50" high x 12.25" deep. This compartment shall have an aluminum shutter type roll-up door.

The full height compartment behind the rear wheels shall have a doorframe-to-door frame dimension of 47.50" wide x 63.75" high. The Clear door opening shall be 46.00" wide x 57.50" high. The usable compartment space for the full depth area shall be 47.50" wide x 33.00" high x 26.50" deep and the area under the roll shall be 47.50" wide x 24.50" high x 12.25" deep. This compartment shall have an aluminum shutter type roll-up door.

The upper compartment above the rear wheels shall have a doorframe-to-doorframe dimension of 58.00" wide x 30.50" high. The clear door opening shall be 56.50" wide x 25.25" high. The usable compartment space shall be 63.38" wide x 26.25" high x 12.25" deep. This compartment shall have an aluminum shutter type roll-up door.

Ground Ladder Storage Compartment

A ground ladder storage compartment/tunnel shall be provided on the right side of the body. The storage compartment shall be enclosed in the upper portion of full depth compartment. The ladder storage area shall be accessible for maintenance or cleaning through removable cover plates inside each upper side compartment that the tunnel passes through. The compartment shall be capable of holding extension, roof, folding ladders and pike poles. The ladders shall be stored vertically from the rear of the apparatus through a single vertically hinged door with a Circle "D" handle. The door hinge shall be located on the right side.

The ladder storage compartment shall be approximately 12.25" wide x 31" high and shall accommodate ladder-nesting combinations of 11.00" wide x 31.00" high. Length shall depend on the ladders.

Keyed Locks - None

Compartment Rear Door Shall Be Smooth Aluminum For Paint/Chevron

The rear door of the compartment shall be smooth aluminum for paint or chevron application.

Ladder Bay Light

The ladder bay opening shall be illuminated by one (1) LED light from Triton, model TLPC (or equivalent). The weatherproof light shall have a 15 LED bulb and a lens that measures 1.125” in diameter. The light shall be activated by opening the bay door ladder. The door switch shall be integrated into the door ajar hazard warning system.

Finish – Tunnel Interior

The interior of the tunnel shall be painted with a gray Zolatone type paint following the Zolatone Coat application process.

Vents

Compartment vents shall be provided to meet the requirements of NFPA 1901, current edition.

Rear Aluminum Inner Liners

Full semi-circular inner liners shall be provided in each wheel housing. They shall be constructed of aluminum and shall be bolted in place so they may be removed if damaged. Self-tapping sheet metal screws are not acceptable. The bottom edge of liner shall be reinforced along its full length; however, it shall not have a formed reinforcement flange to avoid trapping dirt and debris.

Rear Fenderette

Polished stainless steel fenderettes shall be installed on the rear wheel openings. The fenders shall be wide enough to completely cover the outside rear tire and reduce wheel splash up the sides of the body. They shall be installed with 1/4" hex head bolts, self-tapping sheet metal screws are not acceptable. A full width rubber welt shall be placed between the fenderette and body wheel well opening flange. The outside edge of the welting shall form a "V" bead between the fender and the body side face to prevent moisture from entering. The inside edge shall also have a small, raised bead. The outside edge of fenderette, at the wheel opening, shall be rolled inward to eliminate any sharp edges and avoid injury when cleaning the apparatus.

Rear Fender Panels

Painted 3CR12 stainless steel fender panels shall be provided on the outer face of each fender area. The panels shall be painted to match the job color.

Rear Compartment

One (1) full height, full width compartment shall be provided at the rear of the apparatus above the tailboard, 42.00" wide x 50.63" high x 28.00" deep. The compartment shall be transverse as standard with a 25.75" wide x 29.75" high transverse area through each rear side compartment. In the rear wall, there shall be a removable access cover adequately sized to service the fuel tank pickup tube and sending unit without having to remove the tank.

The full height compartment shall have a doorframe-to-doorframe dimension of 38.00" wide x 45.75" high. The clear door opening shall be 36.50" wide x 40.50" high. The usable compartment space for the area under the roll shall be 41.75" wide x 40.50" high x 26.50" deep and the area behind the roll shall be 41.75" wide x 7.75" high x 15.75" deep. This compartment shall have an aluminum shutter type roll-up door.

PARTITION(S) - TRANSVERSE REAR COMPARTMENT

One (1) bolt-in partition(s) to match body material shall be installed in the rear transverse compartment. The partition(s) shall be fastened with #10 self-tapping screws. Each partition shall be used to close off one side of the transverse area into the rear tailboard compartment.

Rear Compartment Partition Locations - Both Sides

The rear compartment partition shall be located on both sides

Finish – Body Rear Compartment Interior(S)

One (1) body rear compartment interior(s) shall be finished with gray Zolatone type paint following the Zolatone Coat application process.

Roll-Up Compartment Doors

The side compartment doors shall be R.O.M./Robinson aluminum shutter roll-up type doors (made in the U.S.A.) with an anodized finish. A magnetic door ajar and compartment light system designed within the door to conceal moving parts and prevent parts exposure in the compartment shall be provided. Slats shall be double-wall box frame extrusion and must be anodized to eliminate oxidation and rusting.
Exterior surface shall be flat and interior surface to be concave to help loose equipment from jamming the door. The latch system shall be full-width, one piece, lift bar, enabling operation with one hand. The manufacturer's standard door frame design may be altered or modified to accommodate the roll-up doors.

Keyed Locks - None

Paint Roll-Up Door(S) Job Color

The slats on six (6) roll-up door(s) shall be painted to match the apparatus body. The door frames shall not be painted; they shall remain a satin finish.

Specific terms and conditions of the warranty are as provided by the door manufacturer.

Removable Protective Shield(S)

A removable protective shield shall be provided and installed in the upper portion of six (6) compartment(s) to protect the roll-up door when in the open position. The shield shall be fabricated of 18 gauge brushed stainless steel.

The following compartments shall have protective shields:
LS1, LS2, LS3
RS1, RS2, RS3

Warranty

The R.O.M. Roll-Up Shutter shall be warrantied for manufacturing defects for a period of 7 years from the date of purchase. See warranty certificate for complete details.

ROLL-UP COMPARTMENT DOORS

The compartment door on the rear of the apparatus shall be an R.O.M./Robinson aluminum shutter roll-up type door, made in the U.S.A. with an anodized finish. A magnetic door ajar and compartment light system designed within the door to conceal moving parts and prevent parts exposure in the compartment shall be provided. Slats shall be double-wall box frame extrusion and must be anodized to eliminate oxidation and rusting. Exterior surface shall

be flat and interior surface to be concave to help loose equipment from jamming the door. The latch system shall be full width, one piece, lift bar, enabling operation with one hand. The manufacturer's standard door frame design may be altered or modified to accommodate the roll-up doors.

Keyed Locks - None

Roll-Up Door Finish

The roll-up door(s) shall have a satin finish.

Removable Protective Shield(S)

A removable protective shield shall be provided and installed in the upper portion of one (1) compartment(s) to protect the roll-up door when in the open position. The shield shall be fabricated of 18 gauge brushed stainless steel.
The following compartments shall have protective shields: Rear

Warranty

The R.O.M. Roll-Up Shutter shall be warrantied for manufacturing defects for a period of 7 years from the date of purchase. See warranty certificate for complete details.

Body Doors

All exterior compartment doors on the main body shall be roll-up.

Finish – Body Side Compartment Interior(S)

Six (6) body side compartment interior(s) shall be finished with gray Zolatone type paint following the Zolatone Coat application process.

Da Finished Hose Bed

The interior of the hose bed shall be "DA" finished only, no paint shall be provided. If the body is made of stainless steel, the exposed surfaces on the interior of the hose bed shall be manufactured with 304 stainless steel.

Rear Surface Of Body

The rear facing body surface around the rear compartment shall be covered with smooth aluminum in preparation for the installation of reflective chevron striping.

Adequately reinforced tread plates shall cover any front to back walls facing the step area up to the height of the hose bed floor. Then the remaining upper inside surface shall be covered with brushed stainless steel. All tread plates shall be secured with threaded fasteners.

The rear facing bulkhead of the compartments shall be painted in a job color.

Tailboard

The tailboard shall be 16” deep located between the rear body compartments. The width of the tailboard between the rear body compartments shall be 42" when both compartments are 28" deep, 70" when both compartments are 14" deep, and 56" when one compartment is 14" deep and the other compartment is 28" deep. The tailboard surface shall be 3/16” thick aluminum tread plate with 2-1/2” deep flanges on the front, rear, and side edges. It shall be installed over a heavy-duty steel framework to prevent the
tailboard from bending and flexing. The tailboard support shall be constructed of formed ¼”- 3/8” plate, 2” X 3” tubes, 2” X 2” angles, and 3” structural channels in a welded assembly. It shall be bolted directly to the chassis frame rails, not the body.

All mounting bolts used to fasten the tread plate to the tailboard support shall be 5/16” truss-head Phillips. Self-tapping sheet metal screws shall not be used to install the aluminum tread plate. There shall be a ½” gap between the tailboard and the body to prevent moisture from being trapped.

Hose Load

Location of each size of hose in the bed shall be (from left to right, facing the rear of the truck):
500' of 2.5"
1000' of 5"
500' of 2.5"
200′ of 2.5″

Hose Bed

The hose bed shall be a minimum of 70" wide and shall be thoroughly reinforced at the corners. Removable aluminum grating shall be installed in the bottom of the hose bed to provide ventilation. The grating slats shall be 4-5/8" wide by 1/2" thick and shall have a corrugated or ribbed surface to help drain and dry the hose. The interior of the hose bed shall be smooth and free from all sharp projections that might damage the hose.

Pumper Body Style:

The shape of the hose bed for a pumper body shall be rectangular, 70” wide as standard.

Rescue Pumper Body Style:
The shape of the hose bed for a rescue pumper body shall be T-shaped when the tank is shorter than the height of the body sides. The upper portion shall be 70” wide between the risers as standard. The bottom portion of the hose bed between the compartments shall be 42” wide.

Choosing options such as hatch compartments, hydraulic ladder rack, and/or split body styles (one side pumper and one side rescue) may change the width and shape of the hose bed.

Hose Bed Divider(S)

Three (3) smooth aluminum hose bed dividers shall be provided to separate the individual hose loads.

The divider shall be constructed of .1875” aluminum sheet welded to a T-shaped extruded foot that runs the full length of the partition. The divider(s) shall be fully adjustable by providing slide tracks at the front and rear of the hose bed. The divider shall be held in place by two (2) 5/16" tapered bolts at each end of the partition. The mounting bolts shall turn into threaded slide blocks located in the track. Holes in the T-shaped foot shall be countersunk so the bolt head is flush with the surrounding surface and will not damage the hose.

Partitions smaller than 36" in all dimensions shall have an Etch finish. Larger partitions shall have a DA finish.

There shall be a handhold slot 3" from the back edge of the rear of the partition. The handhold shall be the full height of the partition beginning 3.5" from the top and bottom edges.

Hose Bed Divider's Height - Match Height of Body Risers

The hose bed divider's height approximately match the height of the body risers.

If an upper cross rail is provided, the dividers shall be shortened approximately 3.50" to clear the cross rail.

Hose Bed Divider Reinforcement(S)

A 1.25" round aluminum extrusion slotted on the bottom to fit over the top and rear edge of the partition shall be provided on two (2) hose bed divider(s). The extrusion shall be beveled at the corner and welded in place to reinforce the partition. This option is required for partitions with excessive length or height.

Hose Bed Cover

A hose bed cover made from 20 oz. per square yard polyester shall be provided and installed over the hose bed. The cover shall be coated with a urethane topcoat (vinyl). The rear of the hose bed cover shall be secured and cover the hose bed opening. The hose bed cover shall have the Alsip FD logo on it.

This cover shall secure the hose from unintentional deployment while the vehicle is underway in normal operations.

Vinyl Hose Bed Cover Shall Be Red In Color

The vinyl hose bed cover shall be red in color. Color number of the vinyl is 705-1064.

Hose Bed Cover Shall Be Fastened Down With Velcro Straps And Gator Straps

The hose bed cover shall be fastened down with Velcro straps on the top and Gator straps with stainless steel hook clips on the rear.

Compartment Door Sill Protector(S)

A brushed stainless steel sill protector, approximately .50" wide, shall be provided on eight (8) body compartment door sill(s) to protect the painted finish.

The following compartments shall have a brushed sill protector:
LS1, LS2, LS3
RS1, RS2, RS3
Rear
Ladder Bay

Dri-Dek®

Twelve (12) black Dri-Dek® mat(s) shall be provided and installed on body compartment floors and/or in shelves/trays as specified. Ramped edgings shall not be included.

Compartment Option Location - As Specified

The location of the compartment option(s) shall be as follows:

Compartment Divider(S)

Two (2) vertical compartment dividers(s) shall be installed in the body compartments. Partition(s) shall be constructed of stainless steel and shall be the full height (allowance shall be made for ceiling light) and depth of the compartment. They shall be bolted in place so they may be removed if desired. The finish of the divider shall match that of the compartment interior.

Divider Outboard Flange Direction - Rearward

The divider outboard flange direction shall be rearward.

Compartment Option Location - As Specified

The location of the compartment option(s) shall be as follows:
LS3 & RS3 with 13" of clearance between it and the rear false bulkhead (REF SO 78G72 for placement concept)

Adjustable Shelf Or Shelves

Eight (8) adjustable shelves (with open corners) made from 3/16" smooth aluminum sheet metal shall be provided in the body compartment(s). The shelf lip shall be 1.75" high. Each shelf shall be supported by four (4) stainless steel angles bolted to Aluma-Strut tracks.

When in a split depth compartment, the Aluma-Strut tracks shall only be provided in the upper and lower area where the shelves are located.

The location and the size of the shelves shall be as follows:

A total of (8) shelves follow:

LS1/RS1—shallow and full depth
LS3/RS3--shallow and full depth forward of compartment divider
Rear- above rollout

Finish - Adjustable Shelf (Or Shelves)

Five (5) adjustable shelves shall have a DA finish on the outside edge of the shelf.

Roll Out Tray(S)

One (1) roll out tray assembly(s) shall be provided in the body compartment(s). The tray assembly shall be bolted to the compartment floor.

Tray Construction - Aluminum, Base Depth (Ea)

One (1) base depth tray(s) shall be constructed of 0.188" aluminum and shall have edges on all four sides for added strength. The corners shall be open. The tray lips shall be 1.75" high.

Finish - Roll Out Tray(S)

One (1) roll out tray(s) shall have a DA finish applied to the outside edge of the tray.

Slide master #AM2, 70% Aluminum, 500#, Floor Mount, Base Depth (Ea)

One (1) Slide Master model AM2 aluminum base depth slide mechanisms shall be bolted to the compartment floor. It shall allow the tray to extend 70% of the slide length. The tray/compartment shall be able to support a 500 pound load.

Slide master IMS Lock, 2-Rail

The Slide Master slide mechanism shall be secured with a Slide Master 2-rail IMS spring lock.

Compartment Option Location - As Specified

The location of the compartment option(s) shall be as follows: Rear

Aluminum Pegboard

A pegboard constructed of .1875" aluminum, with mill finish and mounted on Unistrut, shall be located on the back wall of six (6) compartment(s). The pegboard shall be 30" in height and as wide as the compartment door opening (minus 1.5"). The entire surface of the pegboard shall be filled with mounting holes from edge to edge. Pegboards in the full height compartments shall be located in the upper portion only. The board(s) shall be easily removable to allow for installation of fire department tools and equipment.

Compartment Option Location - As Specified

The location of the compartment option(s) shall be as follows:

LS1, LS3, LS3--up to vertical divider
RS1, RS2, RS3--up to vertical divider

Body Rear Steps

There shall be large polished, chrome-plated, cast aluminum folding steps, each with integral LED light, on both sides of the rear, in sufficient quantities, to meet NFPA regulations for the height configured by the body and tank chosen.

Body Front Steps

There shall be three (3) large polished, chrome-plated, cast aluminum folding steps, each with integral LED light, on the driver's side front of the body.

Two (2) 8" grab rails shall be provided on the front driver's side of the body, as high as possible in compliance with NFPA 1901 requirements for 3-point contact for access and egress at that location.

Handrail - Body, 8", Aluminum, Knurled

The 8" handrails shall be knurled aluminum.

All handrail stanchions shall be chrome plated. They shall be bolted to the body with 1/4" stainless steel hex head bolts. Stanchions shall have a rubberized gasket placed between them and the body surface they are mounted on. A drain hole shall

be provided in each bottom stanchion.

Handrails

One (1) handrail, a minimum of 30" long, shall be provided and installed on each rear beavertail or body side. Each handrail shall be located so as to provide a 3-point stance while climbing onto and off the rear step. The top of the handrail stanchion shall be located approximately 66" from the rear step.

The handrails shall be 1-1/4" diameter extruded, knurled, aluminum with a bright anodized finish. All handrail stanchions shall be chrome plated. They shall be bolted to the body with 1/4" stainless steel hex head bolts. Stanchions shall have a rubberized gasket placed between them and the body surface they are mounted on. A drain hole shall be provided in each bottom stanchion.

INTERMEDIATE CROSS RAIL

One (1) intermediate cross rail shall be installed below the hose bed. The rail width shall match the rear compartment width, or less if other components interfere.

The cross rails shall be 1-1/4" diameter extruded, knurled, aluminum with a bright anodized finish. All cross rail stanchions shall be chrome plated. They shall be bolted to the body with 1/4" stainless steel hex head bolts. Stanchions shall have a rubberized gasket placed between them and the body surface they are mounted on. A drain hole shall be provided in each bottom stanchion.

Rub Rail – Body Sides

Four (4) Bright aluminum polished C-channel rub rails shall be provided along the lower portion of the body, beneath the compartment doors, on each side to prevent damage to the body and finish. The
C-channel shall be mounted so the flat side of the channel is against the body and the legs of the channel protrude outward. The rub rails shall be a minimum of 2.25" wide x 1.25" deep, and shall be mounted on rubber supports. The rub rails shall have a 1.25" x 1.25" chamfer at the front and rear of the rail. The rails shall protrude a minimum of 1.75" from the face of the body.

Rub Rail – Body Rear

Two (2) bright aluminum polished C-channel rub rails shall be provided along the lower portion of the rear of the body, one on each side of the rear bulkhead, to prevent damage to the body and finish. The
C-channel shall be mounted so the flat side of the channel is against the body, and the legs of the channel protrude outward. The rub rail shall be a minimum of 2.25" wide x 1.25" deep and shall be mounted on rubber supports. The rub rail shall have a 1.25" x 1.25" chamfer on both ends of the rail. The rails shall protrude a minimum of 1.75" from the face of the body.

Power Inverter

One (1) Xantrex PRO model XM1800 power inverter (or equivalent) with remote operation/control panel shall be installed. The inverter shall convert DC power stored in batteries into AC power to operate electronics and appliances. The digital remote control shall display power output, AC source and battery voltage.

Inverter shall be located at: TBD at preconstruction

Control panel shall be located at: L1

GENERATOR/INVERTER TEST AND CERTIFICATION

The generator/inverter shall be third party tested at the manufacturer's facility and shall conform to NFPA requirements and standards. Copies of all tests shall be provided with the delivery documentation.

120 VOLT GENERATOR POWERED RECEPTACLE IN BODY COMPARTMENT

A 120-volt, 20 amp, 3-wire receptacle shall be provided inside one (1) body compartment(s) in accordance with NFPA guidelines. A brushed stainless steel cover plate shall be provided to protect the receptacle. The receptacle shall be powered by the on-board generator and labeled accordingly.

Nema Rating - 5-20r (20 Amp) Non-Twist-Lock, Duplex

NEMA Rating: 5-20R (20 Amp) Non-Twist-Lock, Duplex.

Receptacle Cover - Stainless Steel Wall Plate (Interior Use Only) (Ea)

One (1) stainless steel wall plate(s) shall be installed.

Receptacle Location - As Specified

The receptacle shall be located:
Rear compartment (back wall near ceiling)

Breaker - 20 Amp, No Ground Fault Interrupter (Ea)

One (1) 20-amp breaker(s) shall be installed. It shall not have a ground fault interrupter.

Cab 12v Front Brow Mount Light(S)

One (1) Fire Tech Hi-Viz LED combination pattern model FT-B-72-B, 72.69" brow light(s) (or equivalent) shall be mounted to the cab front brow. The light head shall have 57 LED and shall provide 30,096 raw lumen/21,067 effective lumens and draw 23.75 amps total. A combination spot, scene and flood pattern shall be provided. It shall operate at 12 volts DC.

The light head and mounting bracket shall be black.

Cab Front Brow Mount Location - Center

The mount shall be on the center of the cab front brow.

12V Light Switched At Cab Dash & 2nd Location With 3 Way Momentary Switch (Ea)

One (1) 12-volt light(s) shall be switched at the cab dash and a second location with a 3-way momentary switch.

The second location for the switch shall be:Zone #7 for officer

Cab 12v Side Roof Mount Lights

Two (2) Fire Tech Hi-Viz LED combination pattern model FT-MB-18-FT-B-GWA0011, (or equivalent) approximately 25.2" long mini brow lights shall be mounted to the cab roof with a TRGWA mount, one each side parallel to the edge. The light head shall have 18 LED and shall provide 9,504 raw lumen/6,660 effective lumens and draw 7.5 amps. It shall operate at 12 volts of DC.

The light head and mounting bracket shall be black.

Cab Side Roof Light Location - Just Forward Of The Raised Roof Each Side

The cab side roof lights shall be as follows:
Just forward of the raised roof each side

12V Light Switched At Cab Dash & 2nd Location With 3 Way Momentary Switch (Ea)

Two (2) 12-volt light(s) shall be switched at the cab dash and a second location with a 3-way momentary switch.

The second location for the switch shall be: dash zone #7 for officers.

Light Shall Not Activate With Respective Cab Door

The light shall not activate when a cab door on that side opens.

Cab Back 12v Telescopic Light(S)

Two (2) Fire Research Evolution II LED model FCA530-V20-BLA-SW side mount push up telescopic light(s) shall be installed on the back of the cab. The light pole shall be anodized aluminum and have a knurled twist lock mechanism to secure the extension pole in position. The extension pole shall rotate 360 degrees. The outer pole shall be a grooved aluminum extrusion and qualify as an NFPA compliant
handrail. The pole mounting brackets shall have a 3 1/2" offset. Wiring shall extend from the pole bottom with a 4' retractile cord. A steady rest shall be included A steady rest shall be included to provide additional bottom support for the inside pole when it is in the retracted position.

The light head shall have eight (8) ultra-bright white LEDs. It shall operate at 12 volts DC, draw 13/6.5 amps, and generate 20,000 lumens. The light head shall direct 50 percent of the light onto the action area while providing 50 percent to illuminate the working area. The light head angle of elevation shall be adjustable at a pivot in the mounting arm and the position locked with a round knurled locking knob. The light head shall incorporate heat-dissipating fins and be no more than 5 3/16" deep by 3 5/16" high by 11 1/2" wide. A hazard switch shall be provided.

The light head and mounting arm shall be powder coated black.

Cab Telescopic Pole Light Location - One On Each Side Of Cab

The cab telescopic pole lights shall be located on each side of the cab back.

Cab Telescopic Pole Light Head Height - Below Cab Roof Line, Rear Facing

The cab telescopic pole light head height(s) shall be below the cab roof line and shall face the rear.

12V Light Switched With Momentary Switch (Ea)

Two (2) 12-volt light(s) controlled at the master gauge panel with a momentary switch.

Nfpa Required Equipment

NFPA requires that the purchasing authority supply a detailed list of furnished equipment that identifies who will be providing that equipment. The list shall be provided at the time of bid submittal to the manufacturer.

Ground Ladders

Ladders shall be provided in full compliance with NFPA 1901 requirements for pumper trucks. Forty-eight (48) feet of Duo-Safety ladders shall be provided as follows:

- One 24 ft., 2-Section Model 900-A
- One 14 ft., Roof Model 775-A
- One 10 ft., Folding Model 585-A

Folding Ladder Location - Inside Ladder Storage Compartment

The folding ladder shall be located inside the ladder storage compartment.

Ladder Slides

The ladders shall be stored on individual slides to permit easy removal and shall be arranged to allow access and removal of each ladder individually.

Pike Poles/Mounting

The following pike poles shall be furnished:

N.Y.Hooks (S)

One (1) 10 ft. Fire Hooks Unlimited N.Y. Hook shall be provided. The handles shall be solid steel with a pry end at the bottom.

One (1) 8-foot Fire hooks Unlimited N.Y. Hook shall be provided. The handles shall be solid steel with a pry end at the bottom.

Two (2) 6-foot Fire Hooks Unlimited N.Y. Hook shall be provided. The handles shall be solid fiberglass with stainless steel wear sleeves. There shall be a gas shutoff on the end of the pole opposite the hook. (mounting discussed at pre-construction meeting)

Pvc Pike Pole Mount(S)

Two (2) PVC tube(s) shall be mounted to facilitate storage of pike poles.

Pike Pole Mount Location - in Ladder Compartment

The pike pole mount shall be located in the ladder compartment.

Wheel Chocks

Two (2) Worden HWG wheel chocks shall be furnished and shipped loose by the apparatus manufacturer. Two (2) U815

holders shall be installed by the manufacturer on the left side of the body, one in front of and one behind the rear wheel(s).

Processes (if bidder uses another process, please state what the processes are)

The following processes shall be employed in the finishing of the apparatus

Manual Surface Preparation

All metal surfaces on all custom body and cabs shall be thoroughly cleaned and prepared for painting. Surfaces that shall not be painted include all chrome plated, polished stainless steel and bright aluminum tread plate. As required, weld seams and other areas shall be caulked to prevent water leaks or for appearance reasons. Each imperfection on the exterior metal surface shall be removed or filled and then sanded for a smooth flat appearance.

Chemical Cleaning And Treatment

All painted surfaces shall be washed with a chemical degreaser, cleaner and surface conditioner to allow for proper adherence of primer coat. Then they shall be washed with a neutralizer product. All products used are approved by paint supplier and applied under strict process control to meet performance requirements on corrosion prevention and chip resistance.

Primer / Surface Coating For Top Coat Application

A minimum of 2 coats of Epoxy based primer shall be applied to surfaces inside and outside of cabs and bodies and all other parts of apparatus that shall receive a Top color coat to achieve required corrosion protection. After that a minimum of 2 coats of sealer shall be applied over the primer surface. The overall thickness of the primer/sealer coat shall be between 3 to 8 mil wet. Once dried and cured all surfaces
that shall receive a topcoat shall be hand sanded to achieve a flat and smooth surface to meet gloss and other paint quality standards. All products used are approved by paint supplier and applied under strict process control to meet performance and appearance requirements according to Seagrave's Paint Quality Standard. The underside of the cab and body shall be finished with one coat of epoxy primer specifically designed for this application to prevent corrosion and provide chip resistance to typical paved road conditions.

Top Coat Application

Each Topcoat final color on the apparatus is applied using a two-stage paint process. The unit shall be thoroughly hand cleaned to eliminate dust residues and to detect any imperfection in the surfaces to be painted. A fast drying 3.5 VOC polyurethane base coat color shall be applied using a cross-coat application technique. Additional coats may be applied as required until the coat thickness reaches 2.0 to
6.0 mils wet and a full hide appearance. If a second color is required, proper masking shall be applied to the unit, and the base coat application process shall be repeated for the second color. A slow drying low VOC High Build clear coat shall be applied using a cross-coat application technique until a minimum of
5.0 mils wet is achieved. The unit is then properly heated to assure flash and cure the paint before leaving the paint booth. All products used are approved by paint supplier and applied under strict process control to meet performance and appearance requirements according to Seagrave's Paint Quality Standard.

Each batch of topcoats shall be tested for precise color match following paint supplier color matching process. A visual color match shall be checked prior to painting using customer approved paint chips.

The cab and body shall be primed and painted prior to installation on the chassis to ensure paint coverage in all areas

including the difficulty of reaching places. The exterior and interior of the cab shall be finish painted before the doors are installed or any assembly is started to ensure a finished painted surface beneath all trim items.

PRIMER / SURFACE COATING FOR SINGLE COAT APPLICATION

A minimum of 2 coats of Epoxy based primer shall be applied to all surfaces of the apparatus that shall receive a single-color coat to achieve required corrosion protection. This is a wet coat process, and it shall achieve a 3.0 to 8.0 mills wet thickness and complete coverage of all bare metal. All products used are approved by paint supplier and applied under strict process control to meet performance and appearance requirements according to the manufacturer's Paint Quality Standard.

Single Coat Application

A minimum of 2 coats of direct gloss paint shall be applied over all primed surfaces to achieve corrosion protection and appearance in accordance with Seagrave's Paint Quality Standard. This application shall be used for Gloss Black, Job Color and Color finishes in parts of the apparatus such as frame rails, outriggers, ladders and other aerial devices, suspension and other chassis parts, etc. as defined in the sales order.

Zolatone Coat Application

All areas to receive a Zolatone coat shall be primed following the primer/surface coating for topcoat application. A high-pressure coat of Zolatone paint shall be applied in a cross-pattern technique to achieve smooth finished surface. A second low pressure coat of Zolatone paint shall be applied in a single pattern to achieve a textured appearance.

Zolatone Clear Coat Application

Starting with a completed and dry Zolatone coat application 2 to 3 coats of Zolatone clear coat shall be applied until a thickness of 5.0 mills wet is achieved.

Painters

All painters shall be painting supplier certified. They shall be re-certified periodically in order to keep up with the current standards and procedures required by the coatings manufacturer. This certification is performed independently by the paint supplier.

Facility

The finishing facility shall be certified independently by the paint supplier by meeting or exceeding its extensive and stringent requirements. The paint facility shall be audited quarterly by the paint supplier to ensure proper equipment, procedures and safety regulations are being used and adhered to in addition to the controls implemented by manufacturer to assure paint quality requirements are met in every job.

Quality Standards

The finish quality and appearance shall be in accordance with the manufacturer's Paint Quality Standards for dirt, gloss, reflectivity, clarity and depth of image. The standard is available to the customer at any time upon request.

Frame & Undercarriage Finish

The chassis frame, bumper extension, suspension, axles, air tanks, fuel tank, etc., shall be matte black finish as supplied by the component manufacturer. The chassis frame rails; cross members and front bumper extension shall have an additional coat of gloss black paint applied over the primed surface. Single Coat application process shall be used to apply Gloss Black direct gloss paint on identified parts.

The following items shall be furnished with the finish as provided by their respective manufacturers.

- Engine, transmission and accessories.
- Exhaust system.
- Retarder (when furnished).
- PTO & hydraulic pump (when furnished).
- Cab lift cylinders & hydraulic pump.
- Shock absorbers.
- Fuel filter.
- Air drier and air cleaner.
- Electrical wiring and loom.
- Air brake lines, valves and mounting brackets.

Paint Inside Of Cab

The inside of the cab shall be provided with gray Zolatone paint following the Zolatone Coat application process.

The following components shall be painted:

- Exposed interior surfaces of the cab structure
- Exposed interior surfaces of the driver/officer/crew doors
- All interior "Metal" access/wire covers of the cab
- Head bumper brackets
- Miscellaneous brackets, if present: camera mounts, non-recessed radios, charger covers.

Paint Inside Of Cab

The inside of the full tilt cab shall be clear coated following the Zolatone Clear Coat application process in the same components that received a Zolatone application.

Line-X® - Cab Interior

All cab interior LINE-X® shall have a textured finish.

Single Color Cab Paint

The cab shall be painted one color. The paint shall follow the Topcoat application process for a single color.

Cab exterior paint PPG Red as close to the other AFD pumpers.

Note: Paint prices do not allow for metallic or pearlescent paint colors.

Cab Decorative Trim Molding - 5G Radius

Decorative molding shall be provided around the cab. The decorative molding shall be horizontal a c r o s s the front of the cab above the wipers and taper down with a radius even with the outside corners of the grille.

Body Paint, Single Color

The body of the apparatus shall be painted to match the primary cab color. The paint shall follow the Top Coat application process for a single color.

Operator Stand Finish

The operator stand compartment interior, pump, intake and discharge valve, drains, drain lines, and foam system components, and all hard piping, shall have mill finish.

All exposed pipe (not including cut threads) at the rear of the truck or welded pre-connect assemblies at the front of the body shall be painted.

Standard Finishes For Small Parts, Custom Cab

Definition: Mill Finish: as is from the manufacturer; no finish applied. It may have scratches, but it shall be shiny as a result of being cleaned through a deoxidization process. Parts with mill finish may have been cleaned in a dipping process to deoxidize the part.

Definition: Etch finish: The part(s) shall be cleaned and etched to a uniform bright finish.

Chassis

Chassis bracket: Painted same as cab exterior CAB

· Cab compartments, including cab side access compartments:
o Exterior Finish: LINE-X®.
o Interior Finish:
D Mill finish
D Upgrade available to DA or Paint

· Cab compartment shelves:
o DA -Just the outside edge of the shelf shall be DA'd.
o All other surfaces shall be mill finish.

· Bumper / running board hose wells:
o Flange: DA
o Interior & exterior walls: Mill finish
o If the hose well sticks above the gravel pan: DA the edges

· Inner liners: Mill finish

· All steps, including pull downs & those on access ladders: DA outsides

· Hat Section Bracket for Compartment, Ground or Step Lights:
o Mill finish.
o If compartment is painted, then the hat section brackets shall be painted.

· Trim Rings: Mill finish

· Patch plates: Brushed S/S (Upgrade available to polished or ATP) STD is No patch plates

· Label backing plates: DA

· Marker light guards: As purchased

· Switch guards – S/S: Brushed

· Pike poles tubes - Aluminum:
o D/A
o Upgrade available to paint
· Pike poles tubes – S/S:
o D/A
o Upgrade available to paint

Standard Finishes For Small Parts, Operator Stand And Plumbing

Definition: Mill Finish: as is from the manufacturer; no finish applied. It may have scratches, but it shall be shiny as a result of being cleaned through a deoxidization process. Parts with mill finish may have been cleaned in a dipping process to deoxidize the part.

Definition:

Etchfinish: The part(s) shall be cleaned and etched to a uniform bright finish. FINISHES:

· Plumbing: Pump, intake & discharge valves, drains, all hard piping*, including pipes protruding from the pump panel:
o Mill finish
o Upgrade available to job color

·· All exposed pipe (not including cut threads) at the rear of the truck or welded pre-connect assemblies at the front of the body shall be painted job color.

·· All pipe holding brackets made of black steel shall be painted black, or job color if the whole surrounding area is painted job color.

· Pump enclosure interior:
o Mill finish
o Upgrade available to job color

· Open bin interior surfaces:
o Mill finish (or ATP if that is the original surface).
o In no cases, paint unless "specialed" by the customer.

· Crosslays –
o Inside surfaces – DA
o Partitions - DA

· Heat Pans:

o Mill finish
o Upgrade available to DA or paint color of underside

· Running Board w/ Floating Trough:
o Frame shall be painted black.

Standard Finishes For Small Parts, Body Only

Definition: Mill Finish: as is from the manufacturer; no finish applied. It may have scratches, but it shall be shiny as a result of being cleaned through a deoxidization process. Parts with mill finish may have been cleaned in a dipping process to deoxidize the part.

Definition: Etch finish: The part(s) shall be cleaned and etched to a uniform bright finish. BODY

· Bumper / running board hose wells:
o Flange: DA
o Interior & exterior walls: Mill finish
o If the hose well sticks above the gravel pan: DA the edges

· Inner liners: Mill finish

· All steps, including pull downs: DA outsides
·
· Hat Section Bracket for Compartment, Ground or Step Lights:
o Mill finish.
o If compartment is painted, then the hat section brackets shall be painted.

· Trim Rings: Mill finish

· Patch plates:
o STD is No patch plates
o Brushed S/S
o Upgrade available to polished or ATP

· Label backing plates: DA

· Marker light guards: As purchased

- Switch guards – S/S: Brushed

· Compartment louvers: Same color as compartment interior walls,

· Compartment shelves & trays:
o DA (Just the outside edge of the shelf shall be DA'd. All other surfaces shall be mill finish.
o Upgrades available: Paint Zolatone or job color. All surfaces shall be painted.

· Compartment shelf & tray brackets: Mill finish

· Compartment door auxiliary locking brackets: Brushed

· Rear aluminum compartments:
o Mill finish
o Upgrade available to paint

· Rear aluminum compartment door interiors:
o ATP Exterior Door: DA Finish Interior
o Smooth Exterior Door: Etchfinish Interior

· Breaker box mounting brackets: Mill finish

· Pegboard:
o Mill finish
o Upgrade available to DA

· Ladders-Thru Compartments:
o Mill finish
o Upgrade available to paint

· Partition mounting brackets: Mill finish
Ground ladder brackets: Etchfinish

· Pike poles tubes - Aluminum:
o D/A

· Pike poles tubes – S/S:

o D/A
o Upgrade available to paint

· Wheel chock holders: Mill finish

Acorn Nuts

Acorn nuts shall be installed on all exposed screws and bolts in areas where personal injury may result and/or damage to equipment may occur. For further details, please refer to the enclosed standards document

Reflective Striping

An 8" reflective stripe shall be provided around the perimeter of the vehicle. At least 50 percent of the cab and body sides, at least 50 percent of the rear body width and at least 25 percent of the width of the cab front shall have reflective material affixed to it per NFPA standards.

Reflective Striping Color Shall Be White

The reflective striping color shall be white.

2" Reflective Striping

A Two-inch border shall be provided just below the large reflective apparatus striping.

Reflective Striping Color Shall Be White

The reflective striping color shall be white.

Pin Striping

A black 1/4" pin stripe shall be located on each side of the reflective striping.

PIN STRIPING

A black 1/4" pin stripe shall be located on each side of the reflective striping.

Chevron Striping

The front bumper shall be covered with 6" wide reflective striping in an alternating 3M™ Scotchlite™ Red #680-72 and Scotchlite™ Yellow #680-71 chevron pattern with the stripes running at a 45-degree downward angle from the top center of the bumper.

Pin Striping

A black 1/4" pin stripe shall be located between each color of chevron.

Chevron Striping

All rear facing body panels, both outside the hose bed area and under the hose bed, shall be covered with 6" wide reflective striping in an alternating Scotchlite™ Red #680-72 and Scotchlite™ Yellow #680-71 chevron pattern. The stripes shall run at a 45-degree downward angle from the top center of the vehicle.

If the rear compartment is recessed below the hose bed, the surfaces in the recessed area not on the rear face of the truck will be covered with aluminum tread plate. Aluminum tread plate is needed to protect these inner surfaces when hose is loaded or laid.

Pin Striping

A black 1/4" pin stripe shall be located between each color of chevron.

Graphics Files Formats

In order to produce the desired lettering, seals and/or emblems, the customer shall provide graphics files of the lettering, seals and/or emblems in the following file formats:

- Vector images (Ai or EPS file types)
- Full Color (CMYK) version or
- Full color Pantone version, if exact color matching is required

The customer shall also provide the name and size of font for any graphics text, if specific font is desired.

Apparatus Logos And Name Plaques

Logos and name plaques shall be placed on the apparatus as identified in the preconstruction meeting

Manufacturer's Limited Warranty

A manufacturer's limited two (2) year warranty for parts and labor shall be provided.

Cab Fifteen Year Structural Limited Warranty

A manufacturer's cab limited fifteen (15) year structural warranty shall be provided.

Body Fifteen Year Structural Limited Warranty

A manufacturer's limited stainless-steel body fifteen (15) year structural warranty shall be provided.

Chassis Frame Rail & Cross Member Structural Limited Lifetime Warranty

A manufacturer's limited lifetime frame rail and cross members structural warranty shall be provided.

Paint/Corrosion Limited Warranty

A manufacturer's limited pro-rated paint six (6) year warranty shall be provided.

PUMP PLUMBING LIMITED WARRANTY

A manufacturer's limited stainless-steel pump plumbing ten (10) year warranty shall be provided.

Weight Analysis - Loose Equipment

It shall be the responsibility of the purchaser to specify the details of the apparatus; its required performance, including where operations at elevations above 2000 ft (610m) or on grades greater than 6 percent are required; the maximum number of fire fighters to ride within the apparatus; specific added continuous electrical loads which exceed the minimum of this standard; and any hose, ground ladders, or equipment to be carried by the apparatus that exceed the minimum requirements of this standard.

Dealer Service Center

The Dealer must have an authorized service mechanic or service within 50 miles of the Alsip Fire Department.

Electronic Operator's & Parts Manual

An electronic copy of documents as listed below.
Each electronic copy shall have:

· Operations & maintenance instructions for items on the vehicle, except all purchased components. The operations manual shall include locations of the Intelex electrical modules on the apparatus and an Emergency Troubleshooting Guide which includes emergency instructions if the apparatus won't start.
· Material Safety Data Sheets.

- Electrical diagrams including charts illustrating the individual wire color, number code, and function.
- Parts manuals.
- Parts drawings and an overall vehicle layout.
- Certificates
- Warranties

Printed documents shall include:

- Certificates of independent test results.
- Warranty documents.
- Manufacturer's record of construction details and engine power curve.
- Vehicle final alignment report.
- Vendor literature provided by the manufacturer that arrives with the purchased component.

An electronic copy for the water pump shall be included, if there is a pump on the unit, and as provided by the pump manufacturer. Additional electronic copies, as provided by other equipment suppliers, shall also be included.

End of Spec.