PATRICIA A. PESHKA
PURCHASING AGENT

JOSEPH J. SOLOMON
MAYOR

CITY OF WARWICK
PURCHASING DIVISION
3275 POST ROAD
WARWICK, RHODE ISLAND 02886
TEL (401) 738-2013
FAX (401) 737-2364

To: All Prospective Bidders

From: Patricia A. Peshka, Purchasing Agent

Date: March 14, 2019

Re: **Bid2019-274 Fire Department Pumper**

Addendum #1

Please be advised that the information provided comprises Addendum # 1.

An updated specification file has been posted including the following changes:

1. Under the heading "***Suspensions***", remove the description entitled "***Independent Front Suspension***" in its entirety.
2. Under the heading "***Pump Panel Roll Up Compartment Doors***". Replace the word "*painted*" in the first sentence with the word "*satin*"
3. Under the heading "***Left Rear Discharge Akron Valve***", replace the word "*right*" with the word "*left*".
4. Remove sections entitled ***"Multiplex Electrical System"*** and ***"Multiplex System"*** in their entirety.
5. Under the heading "***Striping***". Remove the word "*customer*".

Should you have any questions regarding this proposal, please contact Captain Michael Mernick, Warwick Fire Department, at 401-440-1010.

Thank you for your interest in this project.

PLEASE COMPLETE THIS PAGE & SUBMIT WITH YOUR BID

Bid2019-274 Fire Department Pumper

	Bidder Complies	
	Yes	No

WARWICK FIRE DEPARTMENT PUMPER SPECIFICATIONS

CAPACITY, RESTRICTIONS AND COMPLIANCE

Vehicle Loaner

At the time that the Bid is awarded, the successful bidder must offer a loaner vehicle program. This apparatus must be approved by and used as a front-line apparatus by the WFD, until the specified vehicle is delivered and put in service.

Exterior Paint Scheme

The exterior paint scheme must be determined by the WFD prior to production.

Toolboard Mounting System, Pac Trac or similar

Toolboards must be provided for each of the six (6) side, body compartments (R1,R2,R3 & L1,L2,L3). These toolboards must be appropriately sized to accommodate tool mounting on the largest inside surface of each side compartment.

Toolboards must be manufactured from one or more, mill finish aluminum extrusion panels. These panels must have integrated grooves or channels for use with mounting inserts.

Toolboard panels must be mounted using appropriate mounting kits, each with pre-punched holes for fastening to each end of the extrusions and to the compartment wall. These panels must be appropriately assembled and mounted to the interior compartment walls, installer provided fasteners may be used as needed.

Toolboard Mounting System Allowance

An allowance must be provided for the allotment of tool and equipment mounting brackets and accessories for mounting specific tools and equipment as designated by the WFD in all six (6) side, body compartments. Location and equipment to be mounted must be specified prior to final acceptance.

Task Force Tips Blitz-Fire Portable Monitor

One (1) Task Force Tips Blitz-Fire lightweight, portable monitor with stackable tips and a mounting bracket must be provided.

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Bid2019-274 Fire Department Pumper

	Bidder Complies	
	Yes	No
Hose Bed Capacity The hose bed must have the capacity to store the following hose from the driver side to the officer side. 225 feet (3 – 75 foot sections/lengths) of 1.75 inch pre connected fire hose with fog nozzle 1000 feet (10 - 100 foot sections/lengths) of 4 inch large diameter supply hose 600 feet (12 – 50 foot sections/lengths) of 2.5 inch fire hose with nozzle 150 (3 – 50 foot sections/lengths) of 2.5 inch fire hose with nozzle **Equipment Capacity** Equipment allowance on the apparatus must be 2000 lbs. This allowance is in addition to the weight of the hoses and ground ladders listed in the shop order as applicable. **Overall Height Restriction** The maximum height of the apparatus and all topside protrusions must not exceed: 9feet – 11inches (119"). Must be capable of fitting under a ten foot (10') height restricted railroad overpass. No Exceptions. **Overall Length Restriction** The maximum length of the apparatus must not exceed: 32' (384") **Overall Width** An overall width restriction has not been specified for this apparatus. **Max Wheelbase** The maximum wheelbase of the apparatus must not exceed: 200" **Angle of Approach** The angle of approach for the apparatus must not be less than eight (8) degrees as specified by the current edition of NFPA 1901. **Angle of Departure** The angle of departure for the apparatus must not be less than eight (8) degrees as specified by the current edition of NFPA 1901. **Center Of Gravity** The apparatus, prior to acceptance, must be required to meet the vehicle stability of the		

	Bidder Complies	
	Yes	No

applicable NFPA Automotive Fire Apparatus Standard. While fully loaded to the estimated in service weight a calculated center of gravity must be provided. The calculated or measured center of gravity (CG) must be no higher that 80-percent of the rear axle track width.

NFPA Compliance

All components of the apparatus must be compliant with NFPA 1901, 2016 edition.

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FRONT BUMPER

Bumper

A heavy duty steel channel type front bumper must be provided. The bumper must be constructed from ASTM A36, 1/4" thick steel. The front corners of the bumper must be angled to reduce swing clearance. The bumper must be painted job color. The max height of the bumper must be 12"

Bumper Extension

The bumper chassis frame extension must be approximately 16" and no more than 20" from the face of the cab as required.

Bumper Gravel Shield

The extended front bumper gravel shield must be made of 3/16" (.188") aluminum tread plate material or from NFPA compliant, slip-resistant polished aluminum or Anti slip Line-x coating or similar. The shield must fully cover the top flange of the heavy duty front bumper.

Front bumper components must be in this order from left to right:

Air Horn / Q Siren /Fog Light / Fog Light/ Siren Speaker / Air Horn

Bumper Tray - Center

A hose tray constructed of 1/8" aluminum must be recessed into the front bumper extension. The tray must be located in the center of the bumper and be approximately 14" deep (13" to the top of the slats) and wide enough to accommodate 150 feet of 1.75 inch attack hose and 1 TaskForce

	Bidder Complies	
	Yes	No
Tip – MidForce fog nozzle. One inch thick aluminum slats must be included in the bottom of the hose tray to aid in the dissipation of water from the tray.		
Bumper Hose Tray Lid The center bumper tray must have a lid with the same slip resistant covering/material as the bumper gravel shield. The lid must be hinged with a piano style hinge and include a D-Ring latch, rubber seal and go past the vertical centerline by at least 60 degrees to be held open by an appropriate lifting piston. The bumper tray lid must be notched to allow for pre connected hose. The notch must be 4" front to rear and 3" side to side positioned on the same side as the front bumper discharge swivel.		
Bumper Guide Poles Two – (2) Road-master 48" or equivalent stainless steel lighted guide poles must be installed, one – (1) on each side of the front bumper wired to the chassis running lights.		
FRAME ASSEMBLY **Galvanized Frame Components** The two main C-channel frame rails, front chassis frame extensions, rear frame extensions, rear sub-frame (If equipped), heavy duty cross-members and battery brackets must be hot-dip galvanized for increased corrosion resistance. The coating must be done in compliance with the ASTM A123 Standard.		
Coated Fasteners The custom chassis frame assembly must be assembled using GEOMET 720 coated fasteners for corrosion resistance.		
Frame Assembly The frame must consist of two (2) C-channel frame rails with heavy-duty cross-members. Each frame rail must have the following minimum specifications in order to minimize frame deflection under load and thereby improve vehicle ride and extend the life of the frame: Dimensions: 10-1/4" x 3-1/2" x 3/8" Material: 110,000-psi minimum yield strength, high strength, low alloy steel Section Modulus: 16.61 cu. in.		

	Bidder Complies	
	Yes	No
Resistance to Bending Moment (RBM): 1,827,045 in. lbs. If larger rails are provided, the maximum height of each frame rail must not exceed the 10-1/4" dimension by more than 1/2" in order to ensure the lowest possible body height for ease of access as well as the lowest possible vehicle center of gravity for maximum stability. There must be a minimum of six (6) cross-members joining the two (2) frame rails in order to make the frame rigid and hold the rails/liners in alignment. The cross-members must be a combination of a formed steel C-channel design along with heavy duty steel fabricated designs as required for the exact chassis configuration. The cross-members must be attached to the frame rails with not less than four (4) bolts at each end arranged in a bolt pattern to adequately distribute the cross-member load into the rail/liner and minimize stress concentrations. All frame fasteners must be high-strength Grade 8, flanged-head threaded bolts and nuts for frame strength, durability, and ease of repair. The nuts must be Stover locknuts to help prevent loosening. The frame fasteners must be tightened to the proper torque at the time of assembly. The frame rails must be hot-dip galvanized and powder coated for improved corrosion resistance. The galvanization must be a minimum of 4 mils thick and done in accordance with ASTM A123. The powder coat must be 6.5 mils thick (+/- 1.5 mils) and pass ASTM D3359 testing. The frame cross-members and frame mounted components (suspensions, axles, air tanks, battery boxes, fuel tank, etc.) must be painted black. The apparatus manufacturer must supply a full lifetime frame warranty including cross-members against defects in materials or workmanship. Warranties that provide a lifetime warranty for only the frame rails, but not the cross-members, are not acceptable. NO EXCEPTIONS. The custom chassis frame must have a WHEEL ALIGNMENT in order to achieve maximum vehicle road performance and to promote long tire life. The alignment must conform to the manufacturer`s internal specifications. All wheel lug nuts and axle U-bolt retainer nuts must be tightened to the proper torque at the time of alignment. The wheel alignment documentation must be made available at delivery upon request. **Rear Underbody Support Frame** The body must be supported at the rear by a steel frame extension bolted to the chassis frame rails. The frame rails and frame extensions must be isolated from the aluminum body extrusions at all attachment and or contact points by 5/16" x 2" fiber reinforced rubber. The frame extension must be built with (2) 2.5" sq. x .25 wall thickness x full width cross rails welded to (2) 2.5" sq. x .25 wall thickness side rails. The frame extension assembly must be welded to steel weldments, which are secured to the chassis frame with grade 8 5/8" bolts. The		

	Bidder Complies	
	Yes	No
frame must have a hot-dipped galvanized zinc coating in place of standard for increased corrosion resistance. The coating must be done in compliance with the ASTM A123 Standard and be redone/reapplied to any locations where welding/grinding is required. The frame extension must not interfere with N.F.P.A. minimum requirements for angle of departure. **AXLE OPTIONS** **Front Axle** The vehicle must utilize a Meritor FL-941 or equivalent front axle with a rated capacity of 18,000 lbs. It must have "easy steer" knuckle pin bushings and 68.5" kingpin centers. The axle must be of I-beam construction. The vehicle must have a nominal cramp angle of 45 degrees, plus two (+ 2) degrees to minus three (- 3) degrees including front suction applications. The front axle hubs must be made from ductile iron and must be designed for use with 10 hole hub-piloted wheels in order to improve wheel centering and extend tire life. The front springs must be parabolic tapered, minimum 4" wide x 54" long (flat), minimum three (3) leaf, progressive rate with bronze bushings and a capacity of 18,000 lbs. at the ground. Tapered leaf springs provide a 20% ride improvement over standard straight spring systems. Supporting documentation/data must be provided upon request. The vehicle must be equipped with a Sheppard model M-110 or equivalent integral power steering gear. The steering assembly must be rated to statically steer a maximum front axle load of 18,000 lbs. Relief stops must be provided to reduce system pressure upon full wheel cut. The system must operate mechanically must the hydraulic system fail. In order to achieve maximum vehicle road performance and to promote long tire life, there must be a wheel alignment. The alignment must conform to the manufacturer`s internal specifications. All wheel lug nuts and axle U-bolt retainer nuts must be tightened to the proper torque at the time of alignment. The wheel alignment documentation must be made available at delivery. **Front Axle Oil Seals** The front axle wheel bearings must be oil lubricated with sight glass so the oil level can be visually checked via clear inspection windows in the front axle hubs.		

	Bidder Complies	
	Yes	No

Shock Absorbers Front

Koni model 99 or equivalent shock absorbers must be provided for the front axle. The shocks must be three way adjustable.

The shocks must be covered by the manufacturer`s standard warranty.

Rear Axle

The vehicle must be equipped with an Meritor RS-24-160 or equivalent single rear axle with single-reduction hypoid gearing and a manufacturer`s rated capacity of 24,000 lbs. The axle must be equipped with oil-lubricated wheel bearings with Meritor oil seals. The rear axle hubs must be made from ductile iron and must be designed for use with 10 hole hub-piloted wheels to improve wheel centering and extend tire life. A minimum 2-year unlimited miles – parts and labor warrantee must be provided by the axle manufacturer.

SUSPENSIONS

Rear Suspension

The rear suspension must be a Reyco Granning model 79KB or equivalent. The suspension must include pair of linear-rate slipper type leaf springs that eliminate spring eyes and shackles. The suspension must also include one (1) fixed torque arm, one (1) adjustable torque arm and cast spring hangers. The suspension must be rated for the maximum axle capacity.

WHEEL OPTIONS

Front Wheels

The front wheels must be steel hub-piloted disc sized appropriately for the tires.

Front Wheel Trim Package

The front wheels must have chrome plated plastic lug nut covers for use with steel wheels.

Rear Wheels

There must be four hub-piloted steel disc wheels sized appropriately for the tires.

Rear Wheel Trim Package

The rear wheels must have American made chrome plated plastic lug nut covers.

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Bid2019-274 Fire Department Pumper

	Bidder Complies	
	Yes	No

TIRE OPTIONS

Front Tires

Front tires must be two Michelin 315/80R22.5 tubeless type 20 PR radial tires with X Multiway 3D XZE tread or equivalent.

Tires with wheels must have the following weight capacity and speed rating:

18,000 lbs. @ 75 MPH. (Intermittent fire service max load 19,452 lbs)

The tires and wheels must conform to the Tire and Rim Association requirements.

Rear Tires

The rear tires must be Michelin 11R22.5 tubeless type radial tires with XDN2 all weather tread or equivalent.

The tires with wheels must have the following weight capacity:

24,000 lbs. (dual) @ 75 MPH

The wheels and tires must conform to the Tire and Rim Association requirements.

Tire Pressure Indicators

The apparatus must be provided with Real Wheels AirGuard LED tire pressure indicating valve stem caps. When the tire is under inflated by 5-10 PSI, the LED indicator on the cap must flash red. The indicator housings must be shock resistant and constructed from polished stainless steel. The indicators must be calibrated by attaching to valve stem of a tire at proper air pressure per load ratings and easily re-calibrated by simply removing and re-installing them during service.

Real Wheel Part number RWC1234 was superseded by RWC1235 as of June 2015

BRAKE SYSTEMS

Front Brakes

The front axle must be equipped with Meritor DiscPlus EX225H or equivalent 17 inch disc brakes.

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	Bidder Complies	
	Yes	No
The brakes must be covered by the manufacturer`s standard warranty which is two years, unlimited mileage and parts only.		
Rear Brakes		
The rear axle must be equipped with ArvinMeritor or equivalent 16-1/2" x 7" S-cam brakes with cast brake drums. Q-Plus shoes must be provided with up to 24,000 lb. axle ratings and P-Type shoes with over 24,000 lb. axle ratings.		
The rear axle brakes must be furnished with automatic slack adjusters. ArvinMeritor brand or equivalent must be supplied on RS-24-160 and RS-25-160 axles, and Haldex brand or equivalent must be supplied on RS-26-185 and RS-30-185 axles.		
A 3 year/unlimited miles parts and 3 year labor rear brake warranty must be provided as standard by the manufacturer. The warranty must include bushings, seals, and cams.		
Brake System		
The vehicle must be equipped with air-operated brakes and an anti-lock braking system (ABS). The brake system must meet or exceed the design and performance requirements of the current Federal Motor Vehicle Safety Standard (FMVSS)-121, and the test requirements of the current NFPA 1901 Standard.		
A dual-treadle brake valve must correctly proportion the braking power between the front and rear systems. The air system must be provided with a rapid pressure build-up feature, designed to meet current NFPA 1901 requirements, to allow the vehicle to begin its emergency response as quickly as possible.		
A pressure-protection valve must be installed to prevent use of the air horns or other air-operated devices must the air system pressure drop below 85 psi. This feature is designed to prevent inadvertent actuation of the emergency/parking brakes while the vehicle is in motion.		
Two (2) air pressure needle gauges, one (1) each for front and rear air pressure, with a warning light and buzzer must be installed at the driver`s instrument panel.		
The braking system must be provided with a minimum of three (3) air tank reservoirs for a total air system capacity of 5,214 cu. in. One (1) reservoir must serve as the wet tank and a minimum of one (1) tank must be supplied for each of the front and rear axles. The total system must carry a sufficient volume of air to comply with FMVSS-121.		
Tank Capacities in Cubic Inches:		
Wet Front Rear Total		

	Bidder Complies	
	Yes	No
1,738 1,738 1,738 5,214 Spring-actuated emergency/parking brakes must be installed on the rear axle. A Bendix-Westinghouse SR-1 valve, in conjunction with a double check valve system, must provide automatic emergency brake application when the air brake system pressure falls below 40 psi in order to safely bring the vehicle to a stop in case of an accidental loss of braking system air pressure. A four-channel Wabco ABS must be provided to improve vehicle stability and control by reducing wheel lock-up during braking. This braking system must be fitted to both front and rear axles. All electrical connections must be environmentally-sealed for protection against water, weather, and vibration. The system must constantly monitor wheel behavior during braking. Sensors on each wheel transmit wheel speed data to an electronic processor, which must detect approaching wheel lock-up and instantly modulate (or pump) the brake pressure up to five (5) times per second to prevent wheel lock-up. Each wheel must be individually controlled. To improve field performance, the system must be equipped with a dual-circuit design configured in a diagonal pattern. Must a malfunction occur in one circuit, that circuit must revert to normal braking action. A warning light at the driver`s instrument panel must signal a malfunction. The system must also be configured to work in conjunction with all auxiliary engine, exhaust, or driveline brakes to prevent wheel lock-up. To improve maintenance troubleshooting, provisions in the system for an optional diagnostic tester must be provided. The system must test itself each time the vehicle is started, and a dash-mounted light must go out once the vehicle is moving above 4 MPH. A 3 year/300,000 mile parts and labor Anti-Locking Braking System (ABS) warranty must be provided as standard by the manufacturer. **Park Brake Release** One (1) Bendix-Westinghouse PP-5 or equivalent parking brake control valve must be supplied on the dash panel within easy reach of the driver. **AIR SYSTEM OPTIONS** **Air Dryer** The chassis air system must be equipped with a Bendix-Westinghouse AD-9 or equivalent air dryer to remove moisture from the air in order to help prevent the air lines from freezing in cold weather and prolong the life of the braking system components.		

	Bidder Complies	
	Yes	No

Air Inlet

A 1/4" brass quick-release air inlet with a male connection must be provided. The inlet must allow a shoreline air hose to be connected to the vehicle, discharging air directly into the wet tank of the air brake system. It must be located driver door jamb.

Air Lines

Air brake lines must be constructed of color coded nylon tubing routed in a manner to protect them from damage. Brass fittings must be provided.

Air Horns

Dual air horns must be provided, connected to the chassis air system. The horns must be mounted through the front bumper opposite, outer most positions. The front bumper must have two (2) holes punched to accommodate the air horns. A pressure protection valve must be installed to prevent the air brake system from being depleted of air pressure.

Air Outlet

A 3/8" female air hose fitting must be mounted with a 3/8" valve. The fitting and valve must be connected to the air reservoir tank.

Location: driver's side pump panel.

ENGINE & TRANSMISSION

Transmission Selector

A push-button transmission shift module, Allison model 29538373, must be located to the right side of the steering column within easy reach of the driver. The shift position indicator must be indirectly lit for after dark operation. The shift module must have a "Do Not Shift" light and a "Service" indicator light. The shift module must have means to enter a diagnostic mode and display diagnostic data including oil life monitor, filter life monitor, transmission health monitor and fluid level. A transmission temperature gauge with warning light and buzzer must be installed on the cab instrument panel.

Transmission Fluid

The transmission fluid must be TranSynd, Shell Spirax S6ATF A295, or equivalent synthetic as required by the transmission manufacturer.

Vehicle Speed

The maximum speed must be electronic limited to 68 MPH as required by NFPA 1901.

	Bidder Complies	
	Yes	No

Note: Maximum speed may be set at 65 MPH due to tire rating.

ENGINE/TRANSMISSION PACKAGE

Engine

The vehicle must utilize a Cummins L9 or equivalent engine as described below:

- 400 maximum horsepower at 2100 rpm
- 1250 lb-ft peak torque at 1400 rpm
- Six (6) cylinder, charge air cooled, 4-cycle diesel
- 543 cu. in. (8.9 liter) displacement - 4.49 in bore x 5.69 in stroke
- 16.6:1 compression ratio
- Viable Geometry Turbocharged
- Engine must be equipped with Full-Authority Electronics
- Electronic Timing Control fuel system
- Fuel cooler (when equipped with a fire pump)
- Fleetguard FS1022 fuel filter with integral water separator and water-in-fuel sensor approved by the engine manufacturer for use on the engine
- Fleetguard LF9009 Venturi Combo combination full-flow/by-pass oil filter approved by the engine manufacturer for use on the engine
- Engine lubrication system, including filter, must have a minimum capacity of 25 quarts
- Delco-Remy 39 MT-HD 12-volt starter
- Engine manufacturer approved 18.7 cubic foot per minute (cfm) air compressor
- Corrosion inhibitor additive for coolant system
- After treatment system consisting of a oxidation catalyst and diesel particulate filter and selective catalyst reduction system
- Ember separator compliant with current NFPA 1901 standard
- The engine must be compliant with 2017 EPA Emission standards

The engine air intake must draw air through the front cab grill. The intake opening must be located on the officer (right) side behind front cab face with a plenum that directs air to the air filter. The air cleaner intake piping must be made from aluminized steel tubing with flexible rubber hoses. The intake piping clamps must be heavy-duty, constant-torque, T-bolt style to ensure proper sealing under all temperatures in order to keep dust and other contaminants out of the engine intake air stream and protect the engine.

The air cleaner must be an 11" diameter K&N for lower restriction and high air flow. The filtration media must be washable and easily accessed for service. The air filter must have a 3 year / 300,000 mile warranty.

The engine exhaust piping must be a minimum of 4" diameter welded stainless steel tubing. The aftertreatment system must be mounted horizontally under the right-hand frame rail in back

	Bidder Complies	
	Yes	No
of the cab in order to minimize heat transmission to the cab and its occupants. The exhaust must be directed away from the vehicle on the right side ahead of the rear wheels in order to keep exhaust fumes as far away as possible from the cab and pump operator position. A 5-year/100,000-miles parts and labor warranty must be provided as standard by the engine manufacturer. A copy of the Engine Installation Review stating the engine installation meets the engine manufacturer recommendations must be provided as requested. The engine installation must not require the operation of any type of "power-down" feature to meet engine installation tests. **Transmission** The vehicle must utilize an Allison EVS3000P, electronic, 5-speed automatic transmission. A push button shift module must be located right side of the steering column, within easy reach of the driver. The shift position indicator must be indirectly lit for after-dark operation. The shift module must have a "Do Not Shift" light and a "Service" indicator light that are clearly visible to the driver. The shift module must have means to enter a diagnostic mode and display diagnostic data. A transmission oil temperature gauge with warning light and buzzer must be installed on the cab instrument panel to warn the driver of high oil temperatures that may damage the transmission. The transmission must have a gross input torque rating of 1250 lb.-ft. and a gross input power rating of 450 HP. The gear ratios must be as follows: • 1 - 3.49 • 2 - 1.86 • 3 - 1.41 • 4 - 1.00 • 5 - .75 • R - 5.03 The transmission must have an oil capacity of 23 quarts and must be equipped with a fluid level sensor (FLS) system, providing direct feedback of transmission oil level information to the driver. A water-to-oil transmission oil cooler must be provided to ensure proper cooling of the transmission when the vehicle is stationary (no air flow). Air-to-oil transmission oil coolers, which require constant air flow, are not acceptable.		

	Bidder Complies	
	Yes	No
The transmission must be provided with two (2) engine-driven PTO openings located at the 4 o`clock and 8 o`clock positions for flexibility in installing PTO-driven equipment. The automatic transmission must be equipped with a power lock-up device. The transmission lock-up must prevent down shifting of the transmission when the engine speed is decreased during pump operations, thereby maintaining a constant gear ratio for safe operation of the pump. The transmission lock-up must be automatically activated when the pump is engaged in gear. The transmission lock-up must be automatically deactivated when the pump is disengaged for normal road operation. A 5-year/unlimited miles parts and labor warranty must be provided as standard by Allison Transmission. **Automatic Shift to Neutral** The transmission must be programmed to comply with NFPA 1901 and automatically shift to neutral upon application of the parking brake. **ENGINE BRAKE** **Engine Compression Brake** One (1) engine compression brake must be installed to assist in slowing and controlling the vehicle as required by NFPA 1901 for vehicles with gross vehicle weight ratings (GVWR) of 36,000 lbs. or greater. An on-off control switch and a high-medium-low selector switch must be mounted in the cab accessible to the driver. When activated, the engine compression brake must cut off the flow of fuel to the cylinders and alter the timing of the exhaust valves. This must transform the engine into a high-pressure air compressor, driven by the wheels, and the horsepower absorbed by the engine in this mode must slow the vehicle. The selector switch allows the driver to select the amount of retarding power. When the on-off switch is in the "on" position, the engine compression brake must be automatically applied whenever the accelerator is in the idle position and the automatic transmission is in the lock-up mode. If the accelerator is depressed or if the on-off switch is placed in the "off" position, the engine compression brake must immediately release and allow the engine to return to its normal function. **Transmission Programming** The transmission must include the Allison 2nd gear Pre-Select feature. This option must direct the transmission to down shift to second gear when the throttle is released and the engine		

	Bidder Complies	
	Yes	No

compression brake is engaged. This feature is designed to increase brake life and aid vehicle braking.

EXHAUST OPTIONS

Exhaust System

The Exhaust system must meet all current EPA standards. The exhaust system must be stainless steel from the turbo to the aftertreatment system. An insulation wrap must be provided on all exhaust pipes between the turbo and the aftertreatment system to minimize heat loss to that system. The exhaust must terminate horizontally ahead of the right rear wheels and a tailpipe diffuser must be provided to reduce exhaust temperatures. Heat shields must be provided to isolate chassis and body components from exposure to heat and friction of the exhaust system.

Exhaust End Modification

The end of the exhaust tail pipe must be modified to accommodate a Plymovent in-house exhaust extraction system. The tail pipe must be at 90 degrees and straight out below the side of body. A stop ring must be provided on the tail pipe to properly position the Plymovent nozzle. The exhaust outlet must be vented for use with 2013 and newer EPA engines.

ENGINE COOLING PACKAGE

Radiator

The cooling system must include an aluminum tube-and-fin radiator with a minimum of 1,408 total square inches of frontal area to ensure adequate cooling under all operating conditions. There must be a drain valve in the bottom tank to allow the radiator to be serviced. A sight glass must be included for quick fluid level assessment. The radiator must be installed at the prescribed angle in order to achieve the maximum operational effectiveness. This must be accomplished according to established work instructions and properly calibrated angle measurement equipment.

Silicone Hoses

All radiator and heater hoses must be silicone. Pressure compensating band clamps must be used to eliminate hose pinching on all hoses 3/4" diameter and larger. All radiator hoses must be routed, loomed, and secured so as to provide maximum protection from chafing, crushing, or contact with other moving parts.

	Bidder Complies	
	Yes	No

Coolant

The cooling system must be filled with a 50/50 mixture of water and antifreeze/coolant conditioner to provide freezing protection to minus 40 (- 40) degrees F for operation in severe cold temperatures.

Coolant Recovery

There must be a coolant overflow recovery system provided.

Charge Air Cooler System

The system must include a charge air cooler to ensure adequate cooling of the turbocharged air and for proper engine operation and maximum performance.

Charge Air Cooler Hoses

Charge air cooler hoses must be made from high-temperature, wire-reinforced silicone to withstand the extremely high temperatures and pressures of the turbocharged air. The hoses must incorporate a flexible hump section to allow motion and misalignment of the engine relative to the charge air cooler. Charge air cooler hose clamps must be heavy-duty, constant-torque, T-bolt clamps to ensure proper sealing under all temperatures in order to keep dust and other contaminants out of the engine intake air stream and protect the engine.

Fan/Shroud

The fan must be 30" in diameter with eleven (11) blades for maximum airflow and dynamic balance. It must be made of nylon for strength and corrosion resistance. The fan must be installed with grade 8 hardware which has been treated with thread locker for additional security. A fan shroud attached to the radiator must be provided to prevent recirculation of engine compartment air around the fan in order to maximize the cooling airflow through the radiator. The fan shroud must be constructed of fiber-reinforced high temperature plastic. The shroud must be specifically formed with curved surfaces which improves air flow and cooling.

Transmission Cooler

The cooling system must include a liquid-to-liquid transmission cooler capable of cooling the heat generated from the transmission. When a transmission retarder is selected, the cooler must have an increased capacity to handle the additional heat load.

	Bidder Complies	
	Yes	No

FUEL SYSTEMS

Fuel System

One (1) 50 gallon fuel tank must be provided. The tank must be of an all-welded, aluminized-steel construction with anti-surge baffles and must conform to all applicable Federal Highway Administration (FHWA) 393.65 and 393.67 standards. The tank must be mounted below the frame rails at the rear of the chassis for maximum protection. The tank must be secured with two (2) wrap-around T-bolt type stainless steel straps. Each strap must be fitted with protective rubber insulation and must be secured with grade 8 hardware. This design allows for tank removal from below the chassis.

The fuel tank must be equipped with a 2" diameter filler neck. The filler neck must extend to the rear of the vehicle behind the rear tires and away from the heat of the exhaust system as required by NFPA 1901 Standard for Automotive Fire Apparatus. The open end of the filler neck must be equipped with a twist-off filler cap with a retaining chain.

The tank must be plumbed with top-draw and top-return fuel lines in order to protect the lines from road debris. Bottom-draw and/or bottom-return fuel lines are not acceptable. A vent must be provided at the top of the tank. The vent must be connected to the filler neck to prevent splash-back during fueling operations. A .50" NPT drain plug must be provided at the bottom of the tank.

The tank must have a minimum useable capacity of 50 gallons of fuel with a sufficient additional volume to allow for thermal expansion of the fuel without overflowing the vent.

A mechanical fuel pump must be provided and sized by the engine manufacturer as part of the engine.

Fuel Shut-Off

A shut-off valve must be supplied to prevent drain back of fuel into the main supply line during fuel filter changes. The valve must be located on the inlet side of the OEM fuel filter.

Fuel Line

All fuel lines must be rubber.

ALTERNATOR

320 Amp Alternator

There must be a 320 amp Leece Neville or equivalent alternator installed as specified. The alternator must be a Leece Neville 4890JB series or equivalent brushless type with integral

	Bidder Complies	
	Yes	No

rectifier and adjustable voltage regulator with an output of 272 amps per NFPA 1901 rating (320 amps per SAE J56).

BATTERIES

Battery System

The manufacturer must supply four (4) heavy duty Group 31 12-volt maintenance-free batteries. Each battery must be installed and positioned so as to allow easy replacement of any single battery. Each battery must be equipped with carrying handles to facilitate ease of removal and replacement. There must be two (2) steel frame mounted battery boxes, one (1) on the left frame rail and one (1) on the right frame rail. Each battery box must be secured to the frame rail with Grade 8 hardware. Each battery box must hold (2) batteries. The batteries must have a minimum combined rating of 4,000 (4 x 1000) cold cranking amps (CCA) @ 0 degrees Fahrenheit and 820 (4 x 205) minutes of reserve capacity for extended operation. The batteries must have 3/8-16 threaded stud terminals to ensure tight cable connections. The battery stud terminals must each be treated with concentrated industrial soft-seal after cable installation to promote corrosion prevention. The positive and negative battery stud terminals and the respective cables must be clearly marked to ensure quick and mistake-proof identification.

Batteries must be placed on non-corrosive rubber matting and secured with hold-down brackets to prevent movement, vibration, and road shock. The hold-down bracket J-hooks must be cut to fit and must have all sharp edges removed. The batteries must be placed in plastic trays to provide preliminary containment must there be leakage of hazardous battery fluids. There must be two (2) plastic trays, each containing (2) batteries. Each battery tray must be equipped with a rubber vent hose to facilitate drainage. The rubber vent hose must be routed to drain beneath the battery box. The batteries must be positioned in well-ventilated areas.

Battery Jumper Studs

Battery jumper studs must be provided to allow jump-starting of the apparatus without having to tilt the cab.

One (1) positive and one (1) negative jumper stud must be provided.

Battery Warranty

Batteries must have a warranty of twelve (12) months that must commence upon the date of delivery of the apparatus.

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	Yes	No

CHASSIS OPTIONS

Engine Fan Clutch

The engine must be equipped with a thermostatically controlled engine cooling fan. The fan must be belt driven and utilize a clutch to engage when the engine reaches a specified temperature and / or the water pump is engaged (if equipped).

When disengaged, the fan clutch must allow for improved performance from optional floor heaters, reduced cab interior noise, increased acceleration and improved fuel economy.

The fan must be equipped with a fail-safe engagement so that if the clutch fails the fan must engage to prevent engine overheating.

Drivelines

Drivelines must have a heavy duty metal tube and must be equipped with Spicer 1710HD or equivalent universal joints to allow full-transmitted torque to the axle(s). Drive shafts must be axially straight, concentric with axis and dynamically balanced.

Front Tow Hooks

Two (2) heavy duty painted front tow hooks must be securely bolted to the front chassis frame rail extensions to allow towing (not lifting) of the apparatus without damage. They must be mounted in the downward position.

Rear Tow Eyes

Two (2) heavy duty tow eyes made of 3/4" (0.75") thick steel having 2-1/2" diameter holes must be mounted below the body at the rear of the vehicle to allow towing (not lifting) of the apparatus without damage. The tow eyes must be welded to the lower end of a 5" steel channel that is bolted at the end of the chassis frame rails. The tow eyes must be galvanized steel with the same process used for frame components and painted chassis black.

Rear Trailer Hitch Receiver

A rear mounted Class III/IV trailer hitch receiver must be integrated into the frame and constructed from similar galvanized steel used for frame members. The hitch receiver must accommodate a 2" square trailer hitch and have safety chain eyelets. A Class IV rating must be obtained only when a weight distributing hitch is used.

The two (2) trailer electrical connections located proximal to the receiver must be a four (4)-way flat blade recreational vehicle connector for trailer wiring and a second six (6)-way round

	Bidder Complies	
	Yes	No

connector with inverted ground meeting SAE J560 standards providing an auxiliary connection for wiring devices compatible with electric brake systems. An appropriate electric brake controller must be provided and located within reach of the driver.

DEF Tank

A diesel exhaust fluid (DEF) tank with a five (5) gallon capacity must be provided.

The DEF tank must include a heater fed by hot water directly from the engine block to prevent the DEF from becoming too cool to operate correctly per EPA requirements. The tank must include a temperature sensor to control the heater control valve that controls the feed of hot water from the engine to the DEF tank heater.

A sender must be provided in the DEF tank connected to a level gauge on the cab dash.

The tank must be located left side below rear of cab.

Power Steering Cooler

A heat exchanger (cooler) must be installed to maintain desired power steering fluid temperature. The cooler must be a model DH-073-1-1 with air / oil design rated at 6300 BTU/HR @10 GPM. The cooler must be mounted in front of the radiator and plumbed with #10 lines.

II CAB

CUSTOM TILTING CAB

Tilting Cab

The Cab must be a heavy duty, specifically designed for structural integrity and enhanced occupant protection. The cab must be manufactured by the chassis builder in a facility located on the manufacturer's premises. No Exceptions.

The vehicle must be an all-aluminum, fully enclosed tilt cab. The cab must be designed exclusively for fire/rescue service and must be pre-engineered to ensure long life. It must incorporate an integral welded substructure of high-strength aluminum alloy extrusions that creates an occupant compartment that is essentially a protective perimeter. The end result is a

	Bidder Complies	
	Yes	No
distinctive structure that is aesthetically appealing, functionally durable, and characterized by increased personnel safety. The cab must be constructed from 3/16" (0.188") 3003 H14 aluminum alloy plate roof, floor, and outer skins welded to a high-tstrength 6063-T6 aluminum alloy extruded sub frame. Wall supports and roof bows are 6061 T6 aluminum alloy. This combination of a high-strength, welded aluminum inner structure surrounded on all sides by load-bearing, welded aluminum outer skins provides a cab that is strong, lightweight, corrosion-resistant, and durable. The inner structure must be designed to create an interlocking internal "roll-cage" effect by welding two (2) 3" x 3" x 0.188" wall-thickness 6063-T5 aluminum upright extrusions between the 3" x 3" x 0.375" wall-thickness 6061-T6 roof crossbeam and the 2.25" x 3" x 0.435" wall-thickness 6063-T6 sub frame structure in the front. An additional two (2) aluminum upright extrusions within the back-of-cab structure must be welded between the rear roof perimeter extrusion and the sub frame structure in the rear to complete the interlocking framework. The four (4) upright extrusions -- two (2) in the front and two (2) in the rear -- must be designed to effectively transmit roof loads downward into the sub frame structure to help protect the occupant compartment from crushing in a serious accident. All joints must be electrically seam welded internally using aluminum alloy welding wire. The sub frame structure must be constructed from high-strength 6061-T6 aluminum extrusions welded together to provide a structural base for the cab. It must include a side-to-side 3" x 1.5" .375 thick C-channel extrusion across the front, with 3/4" x 2-3/4" (.75" x 2.75") full-width cross member tubes spaced at critical points between the front and rear of the cab. The cab floor must be constructed from 3/16" (0.188") 3003 H14 smooth aluminum plate welded to the sub frame structure to give the cab additional strength and to help protect the occupants from penetration by road debris and under-ride collision impacts. The cab roof must be constructed from 3/16" (0.188") 3003 H14 aluminum tread plate supported by a grid of fore-aft and side-to-side aluminum extrusions to help protect the occupants from		

	Bidder Complies	
	Yes	No
penetration by falling debris and downward-projecting objects. Molded fiberglass or other molded fiber-reinforced plastic roof materials are not acceptable. The cab roof perimeter must be constructed from 4" x 6-5/8" (4" x 6.625") 6063-T5 aluminum extrusions with integral drip rails. Cast aluminum corner joints must be welded to the aluminum roof perimeter extrusions to ensure structural integrity. The roof perimeter must be continuously welded to the cab roof plate to ensure a leak-free roof structure. The cab rear skin must be constructed from 3/16" (0.188") 3003 H14 aluminum plate. Structural extrusions must be used to reinforce the rear wall. The left-hand and right-hand cab side skins must be constructed from 3/16" (0.188") 3003 H14 smooth aluminum plate. The skins must be welded to structural aluminum extrusions at the top, bottom, and sides for additional reinforcement. The cab front skins must be constructed from 3/16" (0.188") 3003 H14 smooth aluminum plate. The upper portion must form the windshield mask, and the lower portion must form the cab front. Each front corner must have a full 9" outer radius for strength and appearance. The left-hand and right-hand sides of the windshield mask must be welded to the left-hand and right-hand front door frames, and the upper edge of the windshield mask must be welded to the cab roof perimeter extrusion for reinforcement. The cab front must be welded to the sub frame C-channel extrusion below the line of the headlights to provide protection against frontal impact. **Cab Mounts** The cab must be independently mounted from the body and chassis to isolate the cab structure from stresses caused by chassis twisting and body movements. Mounting points must consist of two (2) forward-pivoting points, one (1) on each side; two (2) intermediate rubber load-bearing cushions located midway along the length of the cab, one on each side; and two (2) combination rubber shock mounts and cab latches located at the rear of the cab, one (1) on each side. All mounting points must be bolted directly to the frame rail.		

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	Bidder Complies	
	Yes	No

Cab Tilt System

An electric-over-hydraulic cab tilt system must be provided to provide easy access to the engine. It must consist of two (2) large-diameter, telescoping, hydraulic lift cylinders, one (1) on each side of the cab, with a frame-mounted electric-over-hydraulic pump for cylinder actuation.

Safety flow fuses (velocity fuses) must be provided in the hydraulic lift cylinders to prevent the raised cab from suddenly dropping in case of a burst hydraulic hose or other hydraulic failure. The safety flow fuses must operate when the cab is in any position, not just the fully raised position.

The hydraulic pump must have a manual override system as a backup in the event of an electrical failure. Lift controls must be located in a compartment to the rear of the cab on the right side of the apparatus. A parking brake interlock must be provided as a safety feature to prevent the cab from being tilted unless the parking break is set.

The entire cab must be tilted through a 42-45 degree arc to allow for easy maintenance of the engine, transmission and engine components. A positive-engagement safety latch must be provided to lock the cab in the full tilt position to provide additional safety for personnel working under the raised cab. Before lowering the cab, this device must be disengaged using the stay arm control located on the driver's side rear of the cab, providing the operator protection from high engine exhaust temperatures. The stay arm must be safety yellow for high visibility so that it is easy to see whether the arm is in place or not. No Exception

In the lowered position, the cab must be locked down by two (2) automatic, spring-loaded cab latches at the rear of the cab. A "cab ajar" indicator light must be provided on the instrument panel to warn the driver when the cab is not completely locked into the lowered position.

Cab Exterior

The exterior of the cab must be approximately 94" wide x 130" long to allow sufficient room in the occupant compartment for up to four (4) fire fighters. The cab roof must be approximately 100" above the ground with the flat roof option (max height 9'11"). The back-of-cab to front axle length must be a minimum of 58".

Front Axle Fenderette

Front axle fenderette trim must be black rubber for damage and corrosion resistance.

	Bidder Complies	
	Yes	No

Bolt-In Front Wheel Well Liners

Bolt-in front wheel well liners must be constructed of 3/16" (0.188") composite material to provide a maintenance-free, damage-resistant surface that helps protect the underside of the cab structure and components from stones and road debris.

Cab Windshield

The cab windshield must be made from 1/4" (0.25") thick curved, laminated safety glass with a 75% light transmittance automotive tint. A minimum viewing area of 2,700-sq. in. must be provided. Forward visibility to the ground for the average (50th percentile) male sitting in the driver's seat must be no more than 11 feet 7 inches from the front of the cab to ensure good visibility in congested areas.

Cab Interior

The interior of the cab must be of the open design with an ergonomically-designed driver area that provides ready access to all controls as well as a clear view of critical instrumentation.

As an approximation the following must be provided; a minimum of 57.25" of floor-to-ceiling height must be provided in the front seating area of the cab and a minimum of 55.25" floor-to-ceiling height must be provided in the rear seating area. A minimum of 36" of seated headroom at the "H" point must be provided over each fender well.

The interior side to side dimensions must be approximately 87" from wall padding to wall padding and 89.5" from door to door.

The floor area in front of the front seat pedestals must be no less than 24" side to side by up to 25" front to rear for the driver and no less than 24" side to side by up to 27" front to rear for the officer to provide adequate legroom.

All exposed interior metal surfaces must be pretreated using a corrosion prevention system.

The interior of the cab must be insulated to ensure the sound (dbA) level for the cab interior is within the limits stated in the current edition of NFPA 1901. The insulation must consist of 2 oz. wadding and 1/4" (0.25") foam padding or equivalent. The padding board must be backed with 1/4" (0.25") thick reflective insulation. The backing must be spun-woven polyester. Interior cab padding must consist of a rear cab headliner, a rear wall panel, and side panels between the front and rear cab doors.

All cab floors must be covered with a black aggressive slip-resistant surface in accordance with current NFPA 1901.

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	Bidder Complies	
	Yes	No

Cab Interior Color

Cab instrument panel, overhead console, trim panels, headliner, and door panels must be gray.

Engine Cover

The engine cover between the driver and the officer must be a low-rise contoured design to provide sufficient seating and elbow room for the driver and the officer. The engine cover must blend in smoothly with the interior dash and flooring of the cab. An all-aluminum sub frame must be provided for the engine cover for strength.

Either the rear portion of the engine cover must be provided with a lift-up section or some other easily accessible and agreed upon location, to provide easy access for checking transmission fluid, power steering fluid, and engine oil without raising the cab.

The engine cover insulation must consist of 3/4" dual density fiberglass composite panels with foil backing manufactured to specifically fit the engine cover without modification to eliminate "sagging" as found with foam insulation. The insulation must meet or exceed DOT standard MVSS 302-1 and V-0 (UI subject 94 Test).

The rear engine cover area must be covered with molded polyurethane foam. The cover must be approximately .5" thick with a minimum skin thickness of 0.0625 inches. The cover must be provided to reduce the transmission of noise and heat from the engine. The cover must be black with a pebble grain finish for slip resistance.

The engine cover must blend in smoothly with the interior dash and flooring of the cab. The upper left and right sides must have a sloped transition surface running front to rear providing increased space for the driver and officer.

The engine cover and engine service access door cover must be molded 18 lb/cu. ft. (+/-0.5) flexible integral skinned polyurethane foam at a Durometer of 60 (+/- 5.0) per ASTM F1957-99. The cover must be approximately .5" thick with a minimum skin thickness of 0.0625 inches. The cover must be provided to reduce the transmission of noise and heat from the engine. The cover must be black and feature a pebble grain finish for slip resistance.

Steering Wheel

The vehicle must use a tilt and telescopic steering column to accommodate various size operators. An 18" padded steering wheel with a center horn button must be provided. The center horn button must be able to control the federal Q siren. A switch in the dash must be provided to toggle between the vehicle horn and the siren.

	Bidder Complies	
	Yes	No

Storage Areas

Storage areas, with hinged access doors, must be provided below the driver and officer seats. The driver side compartment must be approximately 20" deep x 12" wide x 3.5" high and the officer side compartment must be approximately 14" deep x 12" wide x 11" high (height must be reduced with air or electric seat).

Cab Steps

The front cab steps must be a minimum of 8" deep x 24" wide. The first step must be no more than 24.0" above the ground with standard tires in the unloaded condition per NFPA 1901 standards. The rear cab steps must be a minimum 12" deep x 21" wide. The first step must be no more than 24.0" above the ground with standard tires in the unloaded condition per NFPA 1901 standards. The rear steps must incorporate intermediate steps for easy access to the cab. The steps are to be located inside the doorsill, where they are protected against mud, snow, ice, and weather. The step surfaces must be aluminum diamond plate with a multi-directional, aggressive gripping surface incorporated into the aluminum diamond plate in accordance with current NFPA 1901.

Grip Handles

A black grip handle must be provided on the interior of each front door below the door window to ensure proper hand holds while entering and exiting the cab. An additional black grip handle must be provided on the left and right side windshield post for additional handholds.

Cab Instruments and Controls

Two (2) pantograph-style windshield wipers with two (2) separate electric motors must be provided for positive operation. Air-operated windshield wipers are not acceptable because of their tendency to accumulate moisture, which can lead to corrosion or to freezing in cold weather. The wipers must be a wet-arm type with a one (1) gallon washer fluid reservoir, an intermittent-wipe function, and an integral wash circuit. Wiper arm length must be approximately 28", and the blade length approximately 20". Each arm must have a 70 degree sweep for full coverage of the windshield.

Cab controls must be located on the cab instrument panel in the dashboard on the driver`s side where they are clearly visible and easily reachable. Emergency warning light switches must be installed in removable panels for ease of service. The following gauges and/or controls must be provided:

- Master battery switch/ignition switch (rocker with integral indicator)
- Starter switch/engine stop switch (rocker)

	Bidder Complies	
	Yes	No

- Heater and defroster controls with illumination
- Marker light/headlight control switch with dimmer switch
- Self-canceling turn signal control with indicators
- Windshield wiper switch with intermittent control and washer control
- Master warning light switch
- Transmission oil temperature gauge
- Air filter restriction indicator
- Pump shift control with green "pump in gear" and "o.k. to pump" indicator lights
- Parking brake controls with red indicator light on dash
- Automatic transmission shift console
- Electric horn button at center of steering wheel
- Cab ajar warning light on the message center enunciator

Controls and switches must be identified as to their function by backlit wording adjacent to each switch, or indirect panel lighting adjacent to the controls.

High Idle System

A high idle system must be provided and controlled by the cab-mounted switch. The system must increase engine idle speed to a preset RPM for increased alternator output.

Electrical System

The cab and chassis system must have a centrally located electrical distribution area. All electrical components must be located such that standard operations must not interfere with or disrupt vehicle operation. An automatic thermal-reset master circuit breaker compatible with the alternator size must be provided. Automatic-reset circuit breakers must be used for directional lights, cab heater, battery power, ignition, A/C,and other circuits. An access cover must be provided for maintenance access to the electrical distribution area.

A 6 place, constantly hot, and 6 place ignition switched fuse panel and ground for customer-installed radios and chargers must be provided at the electrical distribution area. Radio suppression must be sufficient to allow radio equipment operation without interference.

All wiring must be mounted in the chassis frame and protected from impact, abrasion, water, ice, and heat sources. The wiring must be color-coded and functionally-labeled every 3" on the outer surface of the insulation for ease of identification and maintenance. The wiring harness must conform to SAE 1127 with GXL temperature properties. Any wiring connections exposed to the outside environment must be weather-resistant. All harnesses must be covered in a loom that is rated at 280 degrees F to protect the wiring against heat and abrasion.

A Vehicle Data Computer (VDC) must be supplied within the electrical system to process and distribute engine and transmission Electronic Control Module (ECM) information to chassis

	Bidder Complies	
	Yes	No

system gauges, the message center, and related pump panel gauges. Communication between the VDC and chassis system gauges must be through a 4 wire multiplexed communication system to ensure accurate engine and transmission data is provided at the cab dash and pump. The VDC must be protected against corrosion, excessive heat, vibration, and physical damage.

Two (2) dual rectangular headlight bezels must be installed on the front of the cab. The low beam headlights must activate with the release of the parking brake to provide daytime running lights (DRL) for additional vehicle safety. The headlight switch must automatically override the DRL for normal low beam/high beam operation.

Cab Crashworthiness Requirement

The apparatus cab must meet and/or exceed relevant NFPA 1901 load and impact tests required for compliance certification with the following:

Side Impact Dynamic Pre-Load per SAE J2422 (Section 5).

Testing must meet and/or exceed defined test using 13,000 ft-lbs of force as a requirement. The cab must be subject to a side impact representing the force seen in a roll-over. The cab must exhibit minimal to no intrusion into the cab's occupant survival space, doors must remain closed and cab must remain attached to frame.

Cab testing must be completed using 13,776 ft-lbs of force **exceeding** testing requirements.

Quasi-static Roof Strength (proof loads) per SAE J2422 (Section 6) / ECE R29, Annex 3, paragraph 5.

Testing must meet and/or exceed defined test using 22,046 lbs of mass as a requirement. Testing must be completed using platen(s) distributed uniformly over all bearing members of the cab roof structure.

Cab testing must be completed using 23,561 lbs of mass **exceeding** testing requirements. The cab must exhibit minimal to no intrusion into the cab's occupant survival space and doors must remain closed.

Additional cab testing must be conducted using 117,336 lbs of mass **exceeding** testing requirements by **over five (5) times**. The cab must exhibit minimal to no intrusion into the cab's occupant survival space and the doors must remain closed.

Frontal Impact per SAE J2420.

Testing must meet and/or exceed defined test using 32,549 ft-lbs of force as a requirement. The cab must be subject to a frontal impact as defined by the standard. The cab must exhibit minimal

	Bidder Complies	
	Yes	No
to no intrusion into the cab's occupant survival space, doors must remain closed and cab must remain attached to frame. Cab testing must be completed using 34,844 ft-lbs of force **exceeding** testing requirements. Additional cab testing must be conducted using 65,891 ft-lbs of force **exceeding** testing requirements by **over two (2) times**. The cab must meet all requirements to the above cab crash worthiness; **NO EXCEPTIONS**. A copy of a certificate or letter verifying compliance to the above performance by an independent, licensed, professional engineer must be provided upon request. For any or all of the above tests, the cab manufacturer must provide either photographs or video footage of the procedure upon request. **Seat Mounting Strength** The cab seat mounting surfaces must be third party tested and in compliance with FMVSS 571.207. **Seat Belt Anchor Strength** The cab seat belt mounting points must be third party tested and in compliance with FMVSS 571.210. **ISO Compliance** The manufacturer must ensure that the construction of the apparatus cab must be in conformance with the established ISO-compliant quality system. All written quality procedures and other procedures referenced within the pages of the manufacturer`s Quality Manual, as well as all Work Instructions, Workmanship Standards, and Calibration Administration that directly or indirectly impacts this process must be strictly adhered to. By virtue of its ISO compliance the manufacturer must provide an apparatus cab that is built to exacting standards, meets the customer`s expectations, and satisfies the customer`s requirements. **Cab Roof** The cab must have a flat roof (non-vista). Maximum vehicle height 9'11".		

	Bidder Complies	
	Yes	No

GRILLE, Painted ABS Steel

The front cooling air intake grille must be constructed of steel mesh and supported by an impact-resistant ABS steel frame providing no less than 81% open area for excellent cooling performance.

CAB DOORS

Cab Doors

Four (4) side-opening cab doors must be provided. Doors must be constructed of a 3/16" (0.188") aluminum plate outer material with an aluminum extruded inner framework to provide a structure that is as strong as the side skins.

Front cab door openings must be approximately 36" wide x 71.5" high, and the rear cab door openings must be approximately 33.75" wide x 73" high. The front doors must open approximately 75 degrees, and the rear doors must open approximately 80 degrees.

The doors must be securely fastened to the doorframes with full-length, stainless steel piano hinges, with 3/8" (0.375") diameter pins for proper door alignment, long life, and corrosion resistance. Mounting hardware must be treated with corrosion-resistant material prior to installation. For effective sealing, an extruded rubber gasket must be provided around the entire perimeter of all doors.

Rear Cab Door Position

The cab rear doors must be moved to the rear of the wheel opening. This door placement facilitates easier entry and egress.

Rear door position to the 58" or (medium cab).

Cab Door Windows

The front door windows must provide a minimum viewing area of 530 sq. in. each. The rear door windows must provide a minimum viewing area of 500 sq. in. each. All windows must have 75% light transmittance automotive safety tint.

Full roll-down windows must be provided for all 4 (four) front cab doors with worm gear drive cable operation for positive operation and long life. Scissors or gear-and-sector drives are not acceptable. Window cranks must be heavy duty style. No exceptions.

	Bidder Complies	
	Yes	No
The rear cab door windows must be manually operated to raise and lower. Window cranks must be heavy duty style. No exceptions. The front windows of the cab must have manual actuation. Window cranks must be heavy duty style. No exceptions. Driver and officer door windows must be full width. **Cab Door Interior Door Handles** Heavy duty (not paddle style) door latches designed for use with a firefighter gloved hand must be provided on the interiors of the doors. The latches must be designed and installed to protect against accidental or inadvertent opening as required by NFPA 1901. No exceptions. Each door latch must feature a military grade aligning dove tail guide striker assembly for precision door closure which prevents sagging throughout the life of the vehicle. No exceptions. **Cab Door Exterior Door Handles** The exterior door handles must be constructed of die-cast steel. They must feature a vertically oriented heavy duty pull style handle which are extended out and suitable for easy grasping with a gloved hand. **Cab Door Locks** Each cab door must have a manual operated door lock actuated from the interior of each respective door. Exterior of each cab door must be provided with a barrel style keyed lock below the cab door handle. The cab must have 1250 keyed door locks provided on exterior doors to secure the apparatus. **Cab Door Panels** The inner door panels must be made from 1/8" (.125") aluminum plate painted Zolatone gray for increased durability. The cab door panels must incorporate an easily removable panel for access to the latching mechanism for maintenance or service. **Cab Door Area Lighting** There must be four (4) clear LED lights provided to illuminate the cab step well area. Each light must be located on each cab door in the inboard position. Each light must be activated by the cab door ajar circuit.		

	Bidder Complies	
	Yes	No

Cab Door Reflective Material

There must be reflective signs on each cab door interior in compliance with all NFPA requirements. Reflective Ruby Red/Lemon Yellow material striping must be supplied on each of the cab doors. The stripes must run from the lower outer corner to the upper inside corner of the panel, forming an "A" shape when viewed from the rear. The reflective material must meet NFPA 1901 requirements for size (96 square inches) and reflectivity.

Cab Compartment Door Trim

A anodize aluminum trim must be located at the bottom edge of the cab exterior compartment openings. The trim must provide added protection of the painted surface of the cab when equipment is placed or removed from the compartments.

MIRRORS

Cab Mirrors

Two (2) Velvac model 2010 or equivalent, heated, remote controlled, stainless steel mirrors must be installed. The west coast style mirrors must consist of a large 7" x 16" flat and 4" x 6" wide angle convex with stainless steel break-away mounts. The adjustment of the main sections of the mirror and the heater control must be through switches accessible to the driver.

MISC EXTERIOR CAB OPTIONS

Front Mud Flaps

Black linear low density polyethylene (proprietary blend) mud flaps must be installed on the rear of the cab front wheel wells. The design of the mud flaps must have corrugated ridges to distribute water evenly.

Handrails

Cab door assist handrails must consist of four (4) 1.25" diameter x 18" long 6063-T5 anodized aluminum tubes mounted directly behind the driver and officer side front and rear door openings each side of the cab. The handrails must be mounted approximately six inches (6") back from the door opening if possible. The handrails must be machine extruded with integral ribbed surfaces to assure a good grip for personnel safety. Handrails must be installed between chrome end stanchions and must be positioned at least 2" from the mounting surface to allow a positive grip with a gloved hand.

	Bidder Complies	
	Yes	No

Receptacle Mounting Plate

A mounting plate must be provided for the battery charger receptacle, battery charger indicator and if applicable the air inlet, etc. The plate must be constructed of 14 gauge brushed finish stainless steel and be removable for service access to the receptacle(s) and indicator.

HVAC

Air Conditioning

An overhead air-conditioner / heater system with a single radiator mounted condenser must be supplied.

The unit must be mounted to the cab interior headliner in a mid-cab position, away from all seating positions. The unit must provide ten (10) comfort discharge louvers, four (4) to the back area of the cab and six (6) to the front. These louvers must be used for AC and heat air delivery. Two (2) additional large front louvers must be damper controlled to provide defogging and defrosting capabilities to the front windshield as necessary.

The unit must consist of a high output evaporator coil and heater core with one (1) high output dual blower for front air delivery, and two (2) high performance single wheel blowers for rear air delivery.

The control panel must actuate the air-distribution system with air cylinders, which are to be separated from the brake system by an 85-90 psi pressure protection valve. A three-speed blower switch must control air speed.

The condenser must be radiator mounted and have a minimum capacity of 65,000 BTU's and must include a receiver drier.

Performance Data: (Unit only, no ducting or louvers)

- AC BTU: 55,000
- Heat BTU: 65,000
- CFM: 1300 @ 13.8V (All blowers)

The compressor must be a ten-cylinder swash plate type Seltec model TM-31HD or equivalent, with a capacity of 19.1 cu. in. per revolution.

The system must be capable of cooling the interior of the cab from 100 degrees ambient to 75 degrees or less with 50% relative humidity in 30 minutes or less.

	Bidder Complies	
	Yes	No
A maximum vehicle height of nine feet, eleven inches (9'11") must be maintained. No Exceptions.		
HVAC Control Location Heating and air conditioning controls must be located in the center dash area.		
SEATS		
Cab Seats All cab seats must be Bostrom brand.		
Officer's Seat One (1) H. O. Bostrom 400 Series fixed seat with high back SCBA storage for the officer`s position must be supplied. Features must include: • Officer's seat must be positioned approximately three and one half inches 3.5" from the outside wall. • Removable "Store-All" side cushions. • Auto-pivot and return headrest to open for improved exit with SCBA. • 12.5" wide SCBA cavity to store leading SCBA Brands. • Built in lumbar support. • Replaceable seat, side and headrest cushions. All seat positions must have a bright red retractable 3-point lap and muster harness, providing additional safety and security for personnel. Extensions must be provided with the seat belts so the male end can be easily grasped and the female end easily located while sitting in a normal position.		
Driver's Seat One (1) H. O. Bostrom Sierra Air 100 seat with high back styling must be supplied for the driver`s position. Features must include: • Removable "Store-All" side cushions. • Manual Fore/Aft. • Air Height Adjust. • Manual back Recline.		

	Bidder Complies	
	Yes	No
• Built in lumbar support. • Replaceable seat, side and headrest cushions. All seat positions must have a bright red retractable 3-point lap and muster harness, providing additional safety and security for personnel. Extensions must be provided with the seat belts so the male end can be easily grasped and the female end easily located while sitting in a normal position. **Seat Cover Material** All seats must have Durawear seat cover material. **Seat Fabric Color** All seats must be black in color. **Seating Capacity Tag** A tag that is in view of the driver stating seating capacity of four (4) personnel must be provided. **Mechanical Air Pack Bottle Bracket** IMMI Smart Dock SCBA bottle bracket(s) must be provided to fit all SCBA bottles currently on the market. No exceptions. The bracket(s) must be located officer's seat, inboard driver's side rear wall, inboard officer's side rear wall. **Rear Wall Seats** Two (2) fold down seats with Bostrom Res-Q-Back seat back with SCBA storage. Location on the rear wall to be driver's side inboard, officer's side inboard. Features must include: • Seat bottom constructed of high density foam with a heavy wear resistant covering • Automatically fold up when not in use to provide increased room in the rear of the cab. • Removable "Store-All" side cushions. • Auto-pivot and return headrest to open for improved exit with SCBA. • 12.5" wide SCBA cavity to store leading SCBA Brands. • Built in lumbar support. • Replaceable seat, side and headrest cushions. All seat positions must have a bright red retractable 3-point lap and muster harness, providing additional safety and security for personnel. Extensions must be provided with the seat belts so		

	Bidder Complies	
	Yes	No

the male end can be easily grasped and the female end easily located while sitting in a normal position.

Seat Belt Extender

ReadyReach seat belt extenders must be provided. The extender must include an arm that places the muster belt D-loop in a closer, easier to reach location.

The extenders must be provided for the driver's seat, officer's seat, inboard driver's side rear wall, inboard officer's side rear wall seat.

STORAGE CABINETS

Equipment Storage Cabinet

There must be one (1) equipment storage cabinet provided over the officer side wheel well of the cab. The storage cabinet must be constructed of 1/8" (.125") smooth aluminum plate. The storage cabinet must be approximately 42" high x 22" (25" Quest) wide x 28" deep.

There must be two (2) adjustable shelves provided in the storage cabinet. The shelves must be constructed of 1/8" (.125") smooth aluminum plate. Each shelf must have a 1" front and rear lip for strength and reinforcement. The shelves must be sized to the interior dimensions of the storage cabinet.

The storage cabinet must be accessible externally of the cab by a locking double pan door and internally by a heavy duty black nylon cargo netting.

The exterior door must be constructed using a box pan configuration. The outer door pan must beveled and must be constructed from 3/16" (0.188") aluminum plate. Inner door pan must be constructed from 3/32" (0.090") smooth aluminum plate and must have nutsert fittings to attach hold-open hardware. The inner pan must have a 95-degree bend to form an integral drip rail.

The exterior door must have a 1" x 9/16" (1" x 0.43") closed-cell "P" EPDM sponge gasket meeting ASTM D-1066 2A4 standards installed around the perimeter of the door to provide a seal that is resistant to oil, sunlight, and ozone.

A drain hole must be installed in the lower corner of the inside door pan to assist with drainage.

A polished stainless steel Hansen D-ring style twist-lock door handle with a #459 latch must be provided on the door. The 4-1/2" (4.5") D-ring handle must be mounted directly to the door latching mechanism with screws that do not penetrate the door material for improved corrosion resistance.

	Bidder Complies	
	Yes	No
The exterior door must be securely attached to the apparatus cab with a full-length stainless steel 1/4" (0.25") rod piano-type hinge isolated from the cab and exterior door with a dielectric barrier. The door must be attached with machine screws threaded into the door frame. The door must have a gas shock-style hold-open device. An anodized aluminum drip rail must be mounted over the compartment opening to assist in directing water run-off away from the compartment. **Medical Storage Cabinet** There must be one (1) medical storage cabinet provided over the driver side wheel well of the cab. The medical storage cabinet must be constructed of 1/8" (.125") smooth aluminum plate. The medical storage cabinet must be approximately 42" high x 22" (25" Quest) wide x 28" deep. There must be two (2) adjustable shelves provided in the medical storage cabinet. The shelves must be constructed of 1/8" (.125") smooth aluminum plate. Each shelf must have a 1" front and rear lip for strength and reinforcement. The shelves must be sized to the interior dimensions of the medical storage cabinet. The medical storage cabinet must be accessible externally of the cab by a locking double pan door and internally by a heavy duty black nylon cargo netting. The exterior door must be constructed using a box pan configuration. The outer door pan must be beveled and must be constructed from 3/16" (0.188") aluminum plate. Inner door pan must be constructed from 3/32" (0.090") smooth aluminum plate and must have nutsert fittings to attach hold-open hardware. The inner pan must have a 95-degree bend to form an integral drip rail. The exterior door must have a 1" x 9/16" (1" x 0.43") closed-cell "P" EPDM sponge gasket meeting ASTM D-1066 2A4 standards installed around the perimeter of the door to provide a seal that is resistant to oil, sunlight, and ozone. A drain hole must be installed in the lower corner of the inside door pan to assist with drainage. A polished stainless steel Hansen D-ring style twist-lock door handle with a #459 latch must be provided on the door. The 4-1/2" (4.5") D-ring handle must be mounted directly to the door latching mechanism with screws that do not penetrate the door material for improved corrosion resistance. The exterior door must be securely attached to the apparatus cab with a full-length stainless steel 1/4" (0.25") rod piano-type hinge isolated from the cab and exterior door with a dielectric barrier. The door must be attached with machine screws threaded into the door frame. The door must have a gas shock-style hold-open device.		

	Bidder Complies	
	Yes	No

An anodized aluminum drip rail must be mounted over the compartment opening to assist in directing water run-off away from the compartment.

Storage Cabinet Finish

The storage cabinets must have a Zolatone or equivalent, gray finish. The finish must be applied to the interior, exterior, shelves (if equipped) and trays (if equipped) of the cabinet.

MISC INTERIOR CAB OPTIONS

Map Box

An aluminum map/storage box must be installed in the cab. The map box must be constructed of 1/8" (.125) smooth aluminum. Hinged drop down doors with push-button latches must be installed on the front of the box for the access to two (2) storage areas. Each storage area must have three (3) fixed shelves for storage of ring binders, map books, etc. Each latch must have a 25 lb. rating.

The map box must be mounted on the engine cover in the center of the cab between the driver and officer seating positions. The map box must be secured and tested to meet with current NFPA requirements.

Approximate dimensions:

Divided storage area - 34" W x 12.50" H x 12" D.

Map Box Finish

The map box must have Zolatone black finish.

Sun Visors

Padded sun visors must be provided for the driver and officer matching the interior trim of the cab and must be flush mounted into the underside of the overhead console.

Air Horn Lanyard

There must be a"Y" style lanyard mounted in the center of the cab that allows the driver and officer to operate the air horns. The lanyard must activate an electrical air switch.

Cup Holder / Storage Tray Enlarged

An enlarged cup holder and tray assembly must be provided on the cab engine cover between the driver and officer. The tray must be approximately 19" wide x 12" long x 1.5" tall and constructed from .125" aluminum plate. The top edge of the tray sides must have a .5" lip and

	Bidder Complies	
	Yes	No
the front corners of the tray must be tapered for dash access. The two (2) cup holders must be constructed from 3.5" diameter pipe approximately 2.5" tall and be located one each side at the rear corners of the tray. The assembly must have a black finish color. **Cab Dash - Severe Duty** The center and officer side dash must be constructed from .125" smooth aluminum plate painted to match the cab interior. The officer side dash panel must be lowered to provide increased visibility. A hinged access panel must be provided on top of the center dash to provide easy access to components within. The lower kick panels below the dash to be constructed from .125" aluminum smooth plate painted to match cab interior. The panels must be removable to allow for servicing components that may be located behind the panels. **Severe Duty Driver Dash** The driver side upper dash must be constructed of smooth aluminum painted to match the cab interior. The upper gauge package must be provided with an ABS housing only. **Overhead Console** A full-width front overhead console must be mounted to the cab ceiling for placement of siren/radio heads (non-LTH cabs only) and for warning light switches. The console must be made from a thermoformed, non-metallic material and must have easily removable mounting plates. The overhead HVAC must be covered with thermoformed, non-metallic, non-fiber trim pieces to provide excellent scuff and abrasion resistance, as well as chemical stain resistance. The thermoformed material must comply with Federal Motor Vehicle Safety Standard (FMVSS) 302 for flammability of interior materials. **Fluid Data Plaque** One (1) fluid data plaque containing required information must be provided based on the applicable components for this apparatus, compliant with NFPA Standards: • Engine oil • Engine coolant • Chassis transmission fluid • Drive axle lubricant		

	Bidder Complies	
	Yes	No

- Power steering fluid
- Pump transmission lubrication fluid
- Other NFPA applicable fluid levels or data as required

Location must be in the driver's compartment or on driver's door.

Grease Fitting Location Map

A grease fitting location map must be provided. The map must show/list the location of all accessible grease fittings that require regular maintenance. The map must be a plaque style in the appropriate size and located in the driver's compartment or on driver's door.

CAB ELECTRICAL OPTIONS

Cab Dome Lights

A Weldon LED dome light assembly with one (1) white lens and one (1) red lens and plastic housing must be installed. The white light activates with appropriate cab door and light assembly switch, the red light activates with light assembly mounted switch only.

There must be two (2) mounted in the front of the cab, one (1) in the driver and one (1) in the officer ceiling.

There must be two (2) mounted in the rear of the cab, one (1) in the driver side and one (1) in the officer side ceiling.

Clamshell Switch

A heavy duty metal clamshell switch must be installed on the officer`s side of the engine cover to operate the Q2B.

Clamshell Switch

A heavy duty metal clamshell switch must be installed on the officer`s side of the engine cover to operate the electronic siren.

Auto-Eject Battery Charger Receptacle

The battery charger receptacle must be a Kussmaul 20 amp NEMA 5-20 Super Auto-Eject #091-55-20-120 with a cover. The Super Auto-Eject receptacle must be completely sealed and have an automatic power line disconnect.

	Bidder Complies	
	Yes	No

The receptacle must be located outside driver's door next to handrail and the cover color must be Yellow.

English Dominant Gauge Cluster

The cab operational instruments must be located in the dashboard on the driver side of the cab and must be clearly visible. The gauges in this panel must be English dominant and must be the following:

- Speedometer/Odometer
- Tachometer with integral hour meter
- Engine oil pressure gauge with warning light and buzzer
- Engine water temperature gauge with warning light and buzzer
- Two (2) air pressure gauges with a warning light and buzzer (front air and rear air)
- Fuel gauge
- Voltmeter
- Transmission oil temperature gauge

This panel must be backlit for increased visibility during day and night time operations.

Headlights

The front of the cab must have four (4) headlights. The headlights must be mounted on the front of the cab in the lower position. The headlights must be day time operational.

Cab Headlights

The quad cab headlight bezels must contain rectangular sealed beam halogen lights.

Cab Turn Signals

There must be a pair of Federal Signal QuadraFlare model QL64Z-ARROW LED (Light Emitting Diode) turn signal light heads with populated arrow pattern and amber lens mounted upper headlight bezel and wired with weatherproof connectors.

12 Volt Outlet

Plug-in type receptacles for hand held spotlights, cell phones, chargers, etc. must be installed in the cab on the officer side dash, driver side dash, rear wall of driver side medical compartment up high, and the rear wall of officer side equipment compartment up high. The receptacles must be wired battery hot.

Battery Charger Location

The battery charger must be located behind driver's seat.

	Bidder Complies	
	Yes	No

Battery Charger

An appropriate battery charger with remote mounted LED display must be installed.

A fully automatic charging system must be installed on the apparatus. The system must have a 120 volt, 60 hertz, 7 amp AC input with an output of 20 amps 12 volts DC. The battery charging system must be connected directly to the shoreline to ensure the batteries remain fully charged while the vehicle is in the fire station or firehouse.

The system must include a remote charging status indicator panel. The panel must consist of two (2) LED lights to provide a visual signal if battery voltage is good or drops below 11.5 volts. The microprocessor must be continuously powered from the battery to provide the charge status.

Cab USB Charging Port

Dual USB charging ports for cell phones, chargers, etc. must be installed in the cab on the officer side dash, driver side dash, rear wall of driver side medical compartment up high, rear wall of officer side equipment compartment up high. The receptacles must be wired battery hot.

DPF Regeneration Inhibit

A momentary regen inhibit switch must be provided for the Diesel Particulate Filter (DPF) regeneration. The switch must inhibit the regeneration process until the switch is reset or the engine is shut down and restarted. The switch must be located within reach of the driver.

III BODY

BODY

Body Mainframe

The body mainframe must be entirely constructed of aluminum. The complete framework must be constructed of 6061T6 and 6063T5 aluminum alloy extrusions welded together using 5356 aluminum alloy welding wire.

The body mainframe must include 3" x 3" 6061-T6 aluminum 3/8" (0.375") wall crossmember extrusion or 3" x 3" I-beam section aluminum extrusion depending on the application at the front of the body . A solid 3" x 3" "I-beam" section aluminum extrusion must be provided the full width of the body forward and rearward of the rear wheel well. The crossmembers must be designed to support the compartment framing and must be welded to 1-3/16" x 3" (1.188" x 3") solid 6063-T5 aluminum frame sill extrusions. The frame sill extrusions must be shaped to contour with the chassis frame rails and must be protected from contact with the chassis frame

	Bidder Complies	
	Yes	No

rails by 5/16" x 2" (0.31" x 2") fiber-reinforced rubber strips to prevent wear and galvanic corrosion caused when dissimilar metals come in contact.

Body Mounting System

The main body must be attached to the chassis frame rails with six (6) of 5/8" (0.625") diameter steel U-bolts. This body mounting system must be used to allow easy removal of the body for major repair or disassembly.

BODY LEFT SIDE

Driver Side Assembly

The driver side assembly must be constructed entirely of aluminum extrusions and interlocking aluminum plates. This aluminum modular design must provide a high strength-to-weight ratio for increased equipment carrying capacity.

The driver side body corners must be 6063-T5 extruded aluminum corner sections with a 3/16" (0.188") wall thickness. The side body extrusions must be 6063-T5 aluminum tubing with a 3/16" (0.188") wall thickness and 3/16" (0.188") outside corner radius. The corners and sides must be welded both internally and externally at each joint using an aluminum alloy welding wire.

The driver side body must be completely sanded and deburred to assure a smooth finish and painted job color.

Driver Side Compartments

The three (3) driver side compartments must be constructed from 3003 H14 1/8" (.125") smooth aluminum plate. The compartments must be modular in design and must not be a part of the body support structure.

There must be one (1) compartment located ahead of the rear wheels. This compartment must be **approximately** 42" wide x 68" high x 26" deep in the lower 30" high section and 12" deep in the upper 38" high section. The compartment must contain approximately 30 cu. ft. of combined storage space. The door opening must be approximately 42" wide x 68" high.

There must be one (1) compartment located over the rear wheel. The compartment must be **approximately** 56" wide x 34" high x 12" deep and contain approximately 13.2 cu. ft. of storage space. The door opening must be approximately 56" wide x 34" high.

There must be one (1) compartment located behind of the rear wheels. This compartment must be **approximately** 56" wide x 68" high x 26" deep in the lower 30" high section and 12" deep in

	Bidder Complies	
	Yes	No

the upper 38" high section. The compartment must contain approximately 40 cu. ft. of combined storage space. The door opening must be approximately 56" wide x 68" high.

Each compartment seam must be sealed using a permanent pliable silicone caulk. The walls of each compartment must be machine-louvered for adequate ventilation.

An externally-mounted compartment top must be provided and constructed of a 1/8" (.125") aluminum treadplate.

BODY RIGHT SIDE

Officer Side Assembly

The officer side assembly must be constructed entirely of aluminum extrusions and interlocking aluminum plates. This aluminum modular design must provide a high strength-to-weight ratio for increased equipment carrying capacity.

The officer side body corners must be 6063-T5 extruded aluminum corner sections with a 3/16" (0.188") wall thickness. The side body extrusions must be 6063-T5 aluminum tubing with a 3/16" (0.188") wall thickness and 3/16" (0.188") outside corner radius. The corners and sides must be welded both internally and externally at each joint using an aluminum alloy welding wire.

The officer side body must be completely sanded and deburred to assure a smooth finish and painted job color.

Officer Side Compartments

The three (3) officer side compartments must be constructed from 3003 H14 1/8" (.125") smooth aluminum plate. The compartments must be modular in design and must not be a part of the body support structure.

There must be one (1) compartment located ahead of the rear wheels. This compartment must be **approximately** 42" wide x 68" high x 26" deep in the lower 30" high section and 12" deep in the upper 38" high section. The compartment must contain approximately 30 cu. ft. of combined storage space. The door opening must be approximately 42" wide x 68" high.

There must be one (1) compartment located over the rear wheel. The compartment must be **approximately** 56" wide x 34" high x 12" deep and contain approximately 13.2 cu. ft. of storage space. The door opening must be approximately 56" wide x 34" high.

There must be one (1) compartment located behind of the rear wheels. This compartment must be **approximately** 56" wide x 68" high x 26" deep in the lower 30" high section and 12" deep in

	Bidder Complies	
	Yes	No

the upper 38" high section. The compartment must contain approximately 40 cu. ft. of combined storage space. The door opening must be approximately 56" wide x 68" high.

Each compartment seam must be sealed using a permanent pliable silicone caulk. The walls of each compartment must be machine-louvered for adequate ventilation.

An externally-mounted compartment top must be provided and constructed of a 1/8" (.125") aluminum treadplate.

BODY REAR

Rear Body Compartment

The rear body must be constructed entirely of aluminum extrusions and interlocking aluminum plates and includes a lower full height center rear compartment.

The rear body frame must be 6063-T5 1.5" x 4" and 1.5" x 3"aluminum extrusions with a 3/16" (0.188") wall thickness and 3/16" (0.188") outside corner radius and 1/8" (0.125") aluminum plate. The rear extrusions must be welded both internal and external at each joint using an aluminum alloy welding wire.

Rear Body Compartment

The rear compartment must be constructed from 3003 H14 1/8" (.125") smooth aluminum plate. The compartment must be modular in design and must not be a part of the body support structure.

The compartment must be **approximately** 38" wide x 30" high and as deep as applicable to required tank design per application. The door opening must be approximately 38" wide x 30" high. This compartment must be transverse through to the side rear compartments.

The compartment seams must be sealed using a permanent pliable silicone caulk. Machined louvers must be provided for adequate ventilation.

BODY TAILBOARD

Tailboard Step

A tailboard step must be provided at the rear of the body. The tailboard must 18" in depth and in accordance with NFPA in both step height and stepping surface. The maximum rear step height to the tailboard must not exceed 24".

	Bidder Complies	
	Yes	No
The tailboard step must be formed from 3/16" (0.188") aluminum treadplate and must be reinforced with 6063-T5 1.5" x 3" aluminum extrusion. The tailboard must be in accordance with current NFPA requirements and must include a multi-directional aggressive gripping surface incorporated into the diamond plate. The surface must extend in a vertical direction from the diamond plate sheet a minimum of 1/8" (0.125"). Gripping surfaces must be circular in design, a minimum of 1" diameter and on centers not to exceed 4". The tailboard step must be bolted on to the body from the underside assuring a clear surface and must be easily removable for replacement in the case of damage. **Rear Access Handrails** Handrails must be provided at the rear of the body to assist ground personnel accessing the tailboard step and hosebed area. Each handrail must be constructed of 6063T5 1.25" OD anodized aluminum tube, with an integral ribbed surface to assure a good grip for personnel safety, and must be mounted between chrome stanchions. The handrails must be located- two (2) handrails, one (1) on each side, appropriately sized handrail mounted vertical on the trailing edge of the body and appropriately sized handrail(s) mounted horizontal below the rear hosebed opening. **DOORS** **Roll Up Compartment Doors** An AMDOR brand or equivalent roll up door with satin finish must be provided on a compartment. The door(s) must be installed in the following location(s): B1, L1, L2, L3, R1, R2, R3. The door slats must be 1" aluminum double wall slats with continuous ball & socket hinge joint and recessed dual durometer slat seal, double wall reinforced bottom panel with stainless steel lift bar latching system, bottom panel flange with cut-outs for ease of access with gloved hands, reusable slat shoes with positive snap-in securement, smooth interior door curtain to prevent equipment hang-ups. The slats must have interlocking end shoes on each slat. The slats must have interlocking joints with a PVC/vinyl inner seal to prevent any metal to metal contact and inhibit moisture and dust penetration. The track must be a one-piece aluminum door track / side frame, top gutter with non-marring seal, non-marring recessed side seals with UV stabilizers to prevent warpage, dual leg bottom seal, with all wear component material to be Type 6 Nylon. The track must have a replaceable side seal to prevent water and dust from entering the compartment.		

	Bidder Complies	
	Yes	No

Door ajar switch system must be magnetic proximity based components. Door striker must include support beneath the lift bar to prevent door curtain bounce.

The door opening must be reduced by 2" in width and approximately 8-9" in height depending on door height.

Pump Panel Roll Up Compartment Doors

An AMDOR or equivalent brand roll up door with painted finish must be provided on all compartments. The door(s) must be installed in the following location(s): officer side pump panel, driver side pump panel. The door slats must be 1" aluminum double wall slats with continuous ball & socket hinge joint and recessed dual durometer slat seal, double wall reinforced bottom panel with stainless steel lift bar latching system, bottom panel flange with cut-outs for ease of access with gloved hands, reusable slat shoes with positive snap-in securement, smooth interior door curtain to prevent equipment hang-ups. The slats must have interlocking end shoes on each slat. The slats must have interlocking joints with a PVC/vinyl inner seal to prevent any metal to metal contact and inhibit moisture and dust penetration.

The track must be a one-piece painted aluminum door track / side frame, top gutter with non-marring seal, non-marring recessed side seals with UV stabilizers to prevent warpage, dual leg bottom seal, with all wear component material to be Type 6 Nylon. The track must have a replaceable side seal to prevent water and dust from entering the compartment.

Door ajar switch system must be magnetic proximity based components. Door striker must include support beneath the lift bar to prevent door curtain bounce.

The door opening must be reduced by 2" in width and approximately 8-9" in height depending on door height.

Drip Pans

Drip pan for all roll-up doors. Location(s): B1, L1, L2, L3, R1, R2, R3.

COVERS

Hose Bed Cover

A cover constructed of Black 18 oz. PVC vinyl coated polyester must be installed over the apparatus hose bed. The base fabric must be 1000 x 1300 Denier Polyester with a fabric count of 20 x 20 square inch.

The front edge of the cover must be mechanically attached to the body. The sides of the cover must be held in place with nylon covered elastic synthetic rubber cord with stainless steel hooks

	Bidder Complies	
	Yes	No
spaced approximately 12" apart running the length of the hose bed. The rear of the cover must have an integral flap that extends down to cover the rear of the hose bed. This flap must be secured in place with heavy duty nylon straps to comply with the latest edition of NFPA 1901. **Speedlay Cover - Sides [Qty: 3]** A pair of covers constructed of heavy duty black nylon cargo netting must be installed over the side openings of the apparatus speedlay. One pair per opening must be provided. The covers must be secured in place to comply with the latest edition of NFPA 1901. **SPEEDLAY MODULE** **Speedlay Module** An aluminum extruded speedlay module with an area for a triple speedlay must be provided and located to the forward area of the pump module. The speedlay module must be constructed entirely of aluminum extrusions and interlocking aluminum plates. The exterior surface of the speedlay module must have a sanded finish. **Speedlay Preconnect Storage** The module design must include an area for three (3) stacked speedlays (side by side). The floor of the module must be slotted to prevent the accumulation of water and allow for ventilation of wet hose. Two (2) 1/4" (.25") smooth aluminum plate non-adjustable divider with a sanded finish must be provided to separate the speedlays. **Speedlay Compartments** The area directly below the speedlay must include two (2) compartments, one (1) each side. Each compartment must provide approximately 1.4 cu. ft. of storage space. The compartments must include vertically-hinged 1/8" (.125") aluminum treadplate doors with push-button latches. A switch wired to the door ajar indicator light in the cab must be provided interlocked with the parking brake per NFPA. **Speedlay Module Running Boards** The speedlay module must include a running board on each side of the module. The running boards must be in accordance with NFPA in both step height and stepping surface. The maximum step height to each running board must not exceed 24". The running boards must be formed from 1/8" (.125") aluminum treadplate. Each running board must include a multi-		

	Bidder Complies	
	Yes	No
directional, aggressive gripping surface incorporated into the treadplate. The surface must extend vertically from the diamond plate sheet a minimum of 1/8" (.125"). Gripping surfaces must be circular in design, a minimum of 1" diameter and on centers not to exceed 4". Each running board must be bolted on to the pump module and be easily removable for replacement in the case of damage.		
Roller Assemblies Stainless steel rollers with nylon guides set in aluminum extrusions must be installed on the preconnect hose storage area(s).		
The rollers must assist with deployment of hose and to protect the module surface.		
PUMP MODULE		
Pump Module Width Pump module must be 76" wide.		
Enclosed Side Mount Pump Module		
The side mount pump module must be enclosed with roll up doors on both sides. This option increases the module width to be full width of the body.		
Seamless Panels		
The outboard panels of the pump module to be smooth plate seamless and painted job color.		
Pump Module Frame		
An extruded aluminum pump module must be provided and located forward of the apparatus body. The pump module must be constructed entirely of welded aluminum alloy extrusions and interlocking aluminum plates. The pump module framework must consist of 1.5" x 3" x .188" wall, 1.5" x 3" x .375" wall with center web and 3" x 3" x .188" wall extrusions.		
The pump module design and mounting must be separate from the body to allow the pump module and body to move independently of each other in order to reduce stress from frame twisting and vibration.		
The exterior surface of the pump module framework must have a sanded finish.		

	Bidder Complies	
	Yes	No

Pump Module Mounting

The pump module must be attached to the chassis using four (4) center bonded isolation mounts and a steel mounting frame. The isolation mounts must be 2.75" diameter and mount to the chassis with two (2) 4" x 4" x .312" A36 steel angles.

Pump Access

A pump service access door must be provided at the top of the pump panel on both the driver's and officer's side of the pump module. The door must be secured with two (2) thumb latches.

Pump Module Running Boards

The pump module must include a running board on each side. The running boards must be in accordance with NFPA in both step height and stepping surface. The running boards must be formed from .125" aluminum treadplate.

Stepping Surface

Each running board must include a multi-directional, aggressive gripping surface incorporated into the treadplate. The surface must extend vertically from the diamond plate sheet a minimum of .125". Gripping surfaces must be circular in design, a minimum of 1" diameter and on centers not to exceed 4". Each running board must be bolted on to the pump module and be easily removable for replacement in the case of damage.

Pump Panel Opening

The panel opening on the pump module must be 39" wide.

Pump Module Height

Pump module height must be customized per customer specific requirement.

Pump Panels

The driver and officer side pump panels must have a black zolatone or equivalent painted finish.

Pump Access Door

The officer side pump module must include an upper horizontally-hinged pump access door.

The compartment door must be securely attached with a full-length stainless steel piano type hinge with 1/4" pins. The hinge must be "staked" on every other knuckle to prevent the pin from

	Bidder Complies	
	Yes	No
sliding. The door must include two (2) push-button style latches to secure the door in the closed position and two (2) hold-open devices to hold the door in the open position. The door must have a Zolatone or equivalent painted finish the same color as the pump panels and of the same material. **Pump Panel Tags** Color coded pump panel labels must be supplied to be in accordance with NFPA 1901. Color coding must be designed by WFD members at a later date. **PUMP MODULE OPTIONS** **Flex Joint** The area between the pump module/speedlay module and body must include a rubber flex joint. **Air Horn Switch** A heavy duty weatherproof push-button switch must be installed at the pump operator`s panel to operate the air horns. The switch must be labeled:"Evacuation Alert". Location: driver side pump panel. **Storage Pan** A storage pan must be provided in the upper pump module area forward of the hose bed. The pan must be constructed of 3/16" (.188") aluminum treadplate and be removable to service items in the pump module below. Holes must be provided in the corners of the pan to facilitate drainage of water. **WATER TANK** **780 Gallon Water Tank** A 780 gallon (U.S.) "L" booster tank must be supplied. The booster tank must be constructed of polypropylene material. The booster tank must be completely removable without disturbing or dismounting the apparatus body structure. The top of the booster tank is fitted with removable lifting assembly designed to facilitate tank removal. The booster tank top, sides, and bottom must be constructed of a minimum 1/2" (0.50") thick black UV-stabilized copolymer polypropylene. Joints and seams must be fused using nitrogen		

	Bidder Complies	
	Yes	No
gas as required and tested for maximum strength and integrity. The tank construction must include technology wherein a sealant must be installed between the plastic components prior to being fusion welded. This sealing method must provide a liquid barrier offering leak protection in the event of a weld compromise. The tank cover must be constructed of 1/2" thick polypropylene and UV stabilized, to incorporate a multi-piece locking design, which allows for individual removal and inspection if necessary. The tank cover(s) must be flush or recessed 3/8" from the top of the tank and must be fused to the tank walls and longitudinal partitions for maximum integrity. Each one of the covers must have hold downs consisting of 2" minimum polypropylene dowels spaced a maximum of 40" apart. These dowels must extend through the covers and must assist in keeping the covers rigid under fast filling conditions. The tank must have a combination vent and manual fill tower with a hinged lid. The fill tower must be constructed of 1/2" polypropylene and must be a typical dimension of 8" x 8" outer perimeter (subject to change for specific design applications). The fill tower must be blue in color indicating that it is a water-only fill tower. The tower must have a 1/4" thick removable polypropylene screen and a polypropylene hinged cover. The capacity of the tank must be engraved on the top of the fill tower lid. The booster tank must have two (2) tank plumbing openings. One (1) for a tank-to-pump suction line with an anti-swirl plate, and one (1) for a tank fill line. All tank fill couplings must be backed with flow deflectors to break up the stream of water entering the tank, and be capable of withstanding sustained fill rates per the tank fill inlet size. The sump must be constructed of a minimum of 1/2" polypropylene. The sump must have a minimum 3" N.P.T. threaded outlet for a drain plug per NFPA. This must be used as a combination clean-out and drain. The tank must have an anti-swirl plate located approximately 3" above the inside floor. The transverse and longitudinal swash partitions must be manufactured of a minimum of 3/8" polypropylene. All partitions must be equipped with vent and air holes to permit movement of air and water between compartments. The partitions must be designed to provide maximum water flow. All swash partitions interlock with one another and are completely fused to each other as well as to the walls of the tank. All partitions and spacing must comply with NFPA 1901. The walls must be welded to the floor of the tank providing maximum strength. Inside the fill tower there must be a combination vent/overflow pipe. The vent overflow must be a minimum of schedule 40 polypropylene pipe with an I.D. of 3" or larger that is designed to run through the tank. This outlet must direct the draining of overflow water past the rear axle, thus reducing the possibility of freeze-up of these components in cold environments. This drain		

	Bidder Complies	
	Yes	No
configuration must also assure that rear axle tire traction must not be affected when moving forward. The booster tank must undergo extensive testing prior to installation in the truck. The water tank must be tested and certified as to capacity on a calibrated and certified tilting scale. The water tank must be weighed empty and full to provide precise fluid capacity. The tank must be delivered with a Certificate of Capacity delineating the weight empty and full and the resultant capacity based on weight. Engineering estimates for capacity calculations must not be permitted for capacity certification. The tank must be designed and fabricated by a tank manufacturer that is ISO 9001:2008 certified in each of its locations. The ISO certification must be to the current standard in effect at the time of the design and fabrication of the tank. A tag must be installed on the apparatus in a convenient location and contain pertinent information including the capacity of the water tank, the maximum fill and pressure rates, the serial number of the tank, the date of manufacture, the tank manufacturer, and contact information. The tank must have a limited Lifetime warranty that provides warranty service for the life of the fire apparatus in which the tank is installed. Warranties are transferable if the apparatus ownership changes by requesting the transfer from the tank manufacturer. Tank capacity is 780 US gallon / 649 Imperial gallons / 2952 Liters. **Fill Tower Location** Fill tower must be located offset to the driver's side of water tank. The fill tower must be located inside the hose bed storage pan as applicable. **Water Tank Mounting System** The body design must allow the booster tank to be completely removable without disturbing or dismounting the apparatus body structure. The water tank must rest on top of a 3" x 3" frame assembly covered with rubber shock pads and corner braces formed from 3/16" angled plate to support the tank. The booster tank mounting system must utilize a floating design to reduce stress from road travel and vibration. To maintain low vehicle center of gravity the water tank bottom must be mounted within 5" of the frame rail top.		

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	Bidder Complies	
	Yes	No

TANK PLUMBING

Tank Fill 2" Valve

One (1) 2" pump-to-tank fill line having a 2" manually operated full flow valve. The valve control must be located at the pump operator`s panel and must visually indicate the position of the valve at all times. The fill line must be controlled using a chrome handle with an integral tag.

The valve must be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve must have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position with water flowing through it.

The valve must be of unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

All fabricated piping must be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Tank To Pump 3" Valve

One (1) manually operated 3" Akron valve must be installed between the pump suction and the booster tank. Includes flex hose with stainless steel hose clamps for connection to the 4" tank sump outlet . The valve control must be located at the pump operator`s panel and must visually indicate the position of the valve at all times.

The valve must be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve must have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position and water is flowing through it.

The valve must be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

All fabricated piping must be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

A check valve must be provided in the tank to pump supply line to prevent the possibility of "back filling" the water tank. The valve control must be located at the pump operator`s panel and must visually indicate the position of the valve at all times.

	Bidder Complies	
	Yes	No

HANDRAILS / STEPS

Hose Bed Folding Steps

Innovative Controls dual lighted LED folding steps must be positioned to the driver side rear of the body. The steps must be NFPA compliant for access to the hose bed storage area and in step height and surface area. The steps must be staggered stepped as applicable with tailboard depth, not applicable with recessed step mounting.

Innovative Controls dual lighted folding step with LED lights integral to the step on the top to provide NFPA requirements of 2 fc (20 lx) on the stepping surface. Folding step must also have a LED light integral to the bottom of the step to meet NFPA requirements of a stepping surface up to 18" below the step. The folding step must sustain a minimum static load of 500 lb with a 3 to 1 safety factor. The folding step must also meet NFPA slip resistance qualifications. Corrosion resistance must be demonstrated by a 1000 hr salt spray test with no visible signs of deterioration of the step body or hardware.

One (1) hand rail must be installed (as applicable) in compliance with current NFPA. The hand rail must be constructed of 6063T5 1.25" OD anodized aluminum tube, with an integral ribbed surface to assure a good grip for personnel safety, mounted between chrome stanchions.

Intermediate Rear Step

An 10" intermediate step below the hosebed must be provided.

The step must be constructed of 3/16" (.187") aluminum embossed treadplate. The step must be bolted below the hosebed and be easily removable for replacement in the case of damage. The top rear surface of the step to have three (3) hand hold cut-outs horizontally.

HOSE BED

Hosebed Side Assembly

The hosebed side assemblies must be made of 3" x 3" slotted aluminum extrusion and 3/16" (.188") smooth plate. The hosebed side assemblies must provide a 85" high body.

The exterior hosebed side surface must be completely sanded and deburred to assure a smooth finish and painted job color. The interior hosebed side surface must be completely sanded and deburred to assure a smooth sanded finish.

	Bidder Complies	
	Yes	No

Hose Bed

The area above the booster tank must have a hose storage area provided. The hose bed must be constructed entirely from maintenance-free, 3/4" deep x 7.5" wide, extruded aluminum slats that must be pop-riveted into a one-piece grid system. Each slat must have all sharp edges removed and have an anodized ribbed top surface that must prevent the accumulation of water and allow for ventilation of wet hose.

The hose bed design must incorporate adjustable tracks in the forward area and the rearward area of the hose bed for the installation of an adjustable divider(s). The adjustable tracks must hold an adjustable divider(s) mounting nut straight, so only a Philips head screwdriver is required to adjust a divider(s) from side to side (as is practical with other hose bed mounted equipment).

The hose bed must be easily removable to allow access to the booster tank below.

Hose Bed Divider [Qty: 3]

There must be a hose bed divider provided the full fore-aft length of the hose bed.

The hose bed divider must be constructed of 1/4" (0.25") smooth aluminum plate with an extruded aluminum base welded to the bottom. The rear end of the divider must have a 3" radius corner to protect personnel. The divider must be natural finish aluminum for long-lasting appearance and must be sanded and de-burred to prevent damage to the hose.

The divider must be adjustable from side to side in the hose bed to accommodate varying hose loads.

Hose Bed Divider Hand Hold

There must be a hand hole cut-out(s) on the trailing edge of each hose bed divider. The cut-out(s) is specifically sized for use in adjusting of the hose bed divider.

Divider Support

Divider Support must run full width of hosebed (side to side) at the front of the hosebed and towards the rear of the hosebed at top of the divider(s). Attach to each hosebed divider to provide additional support.

Diamond Plate Box

Diamond plate box for Amber, Whelen TAL65 LED directional lightstick and (2) GH scene lights. Box must be mounted on 3" x 3" aluminum angle at rear of hosebed storage pan. Lights must be surface mounted to box.

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	Bidder Complies	
	Yes	No

MISC BODY OPTIONS

Fuel Fill

A recessed fuel fill must be provided at the driver side rear wheel well area. The fuel fill door must cover the recessed fuel fill and be separate from the SCBA storage tubes.

Mud Flaps

Black mud flaps must be provided for the body wheel wells.

Body Wheel Well

The body wheel well frame must be constructed from 6063-T5 aluminum extrusion with a slot the full length to permit an internal fit of 1/8" (0.125") aluminum treadplate. The wheel well trim fenderett must be black rubber to match the front fenderett. The wheel well liners must be constructed of a 3/16" (.187") composite material. The liners must be bolt-on and must provide a maintenance-free and damage-resistant surface.

Rub Rail

The pump area and speedlay modules and body must have rub rails mounted along the sides and at the rear.

The rub rail must be black polypropylene. The rub rail must be approximately 2.75" high x 1.25" deep and must extend beyond the body width to protect compartment doors, the body side, the front bumper and the rear tailboard. The rub rail depth must allow marker and/or warning lights to be recessed inside for protection.

The rub rail must be mounted a minimum of 3/16" off the pump module and body with nylon spacers. The ends of each section must be provided with a finished rounded corner piece.

Anodize Aluminum Trim

A anodize aluminum trim must be located at the bottom edge of all body compartment openings with painted edge (as applicable). The trim must provide added protection of the painted surface of the body when equipment is removed from the compartment.

FOAM

Foam Eductor

An Akron 95 GPM Pyrolite In-Line Foam Eductor with a 30" pick up tube and 1.5" connections must be provided. The eductor must be mounted inside the pump operator's compartment L1.

	Bidder Complies	
	Yes	No

TOOL CHEST

Three Drawer Tool Chest

A red three (3) drawer CTECH or similar insert style tool chest must be provided. The chest must be made of all extruded aluminum with Motionlatch style drawer operation and a tray style top surface. The exposed side must be a finished panel. The chest must be properly mounted in the bottom of the operator's compartment L1. The chest must be approximately half the width of the compartment but no less than twenty four inches (24") wide, with one large nine inch (9") bottom drawer, one five inch (5") middle drawer and one three (3") inch top drawer.

LADDER STORAGE / RACKS

Hose Bed Officer Side Tunnel Storage

An officer side vertical storage tunnel must be provided. The tunnel must be for use with a low hose bed. Tunnel must hold: 2-section 24', 14' roof, 10' attic and (2) pike poles. The tunnel must include a vertical hinged rear diamond plate door with a push-button latch.

Ladder Brand

The ladder brand capable of being carried on the unit must be Alco-Lite.

Ladders

The length of ladders capable of being stored must be the following: 24' 2-section, 14' roof and 10' attic ladders.

SCBA BOTTLE STORAGE

SCBA Strap

Straps must be provided in each exterior storage compartment to provide secondary means to hold each SCBA bottle in the compartment. The straps must be constructed from 1" nylon webbing formed in a loop. The strap(s) must be mounted to the storage compartment ceiling directly inside the door opening at each bottle location.

45 MINUTE SCBA 1 BOTTLE STORAGE

One (1) SCBA bottle storage constructed with aluminum plate with hinged door and push button latch must be provided in the body wheel well area.

The door must match wheel well area material and finish.

	Bidder Complies	
	Yes	No
U-shaped trough made out of aluminum smooth plate with rubber insert must be provided to store SCBA bottles. Location: driver side rear wheel well offset rearward, officer side rear wheel well offset rearward. **45 MINUTE SCBA 2 BOTTLE STORAGE** Two (2) SCBA bottle storage constructed with aluminum plate with hinged door and push button latch must be provided in the body wheel well area. The door must match wheel well area material and finish. U-shaped troughs made out of aluminum smooth plate with rubber inserts must be provided to store standard size 45 minute SCBA bottles up to 7.25" in diameter and 24.5" in length. The troughs can also store a standard size 20lbs ABC Extinguisher or 2.5 gal Water Extinguisher in each trough. Location: driver side rear wheel well offset forward, officer side rear wheel well offset forward. **FIRE PUMP** **Pump Rating** The fire pump must be rated at 1500 GPM. **Fire Pump System** The pump must be a midship-mounted single stage centrifugal pump. The pump must be mounted on the chassis frame rails of commercial or custom truck chassis and have the capacity of 1,250 to 2,250 gallons per minute (U.S. GPM) NFPA 1901 rated performance, and must be split-shaft driven from the truck transmission. The entire pump body and related parts must be of fine grain alloy cast iron, with a minimum tensile strength of 30,000 psi (207 MPa). All metal moving parts in contact with water must be of high quality bronze or stainless steel. Pump body must be horizontally split in two sections, for easy removal of impeller assembly including wear rings and bearings from beneath the pump without disturbing pump mounting or piping. The pump impeller must be hard, fine grain bronze of the mixed flow design and must be individually ground and hand balanced. Impeller clearance rings must be bronze, easily renewable without replacing impeller or pump volute body, and of wrap-around double labyrinth design for maximum efficiency.		

	Bidder Complies	
	Yes	No
The pump shaft must be heat-treated, corrosion-resistant stainless steel and must be rigidly supported by three (3) bearings for minimum deflection. The sleeve bearing is to be lubricated by a force fed, automatic oil lubricated design, pressure-balanced to exclude foreign material. The remaining bearings must be heavy-duty, deep groove ball bearings in the gearbox and must be splash-lubricated. Pump shaft must be sealed with double-lip oil seal to keep road dirt and water out of the gearbox. Two (2) 6" diameter suction ports with 6" NST male threads and removable screens must be provided, one each side. The ports must be mounted one (1) on each side of the midship pump and must extend through the side pump panels. Inlets must come equipped with long handle chrome caps. **Discharge Manifold** The pump system must utilize a stainless steel discharge manifold system that allows a direct flow of water to discharge valves. The manifold and fabricated piping systems must be constructed of a minimum of Schedule 10 stainless steel to reduce corrosion. **Pump Shift** The pump shift must be pneumatically-controlled using a power shifting cylinder. The power shift control valve must be mounted in the cab and be labeled "PUMP SHIFT". The apparatus transmission shift control must be furnished with a positive lever, preventing accidental shifting of the chassis transmission. A green indicator light must be located in the cab and be labeled "PUMP ENGAGED". The light must not activate until the pump shift has completed its full travel into pump engagement position. A second green indicator light must be located in the cab and be labeled "OK TO PUMP". This light must be energized when both the pump shift has been completed and the chassis automatic transmission has obtained converter lock-up (4th gear lock-up). **Test Ports** Two (2) test plugs must be pump panel mounted for third party testing of vacuum and pressures of the pump.		

	Bidder Complies	
	Yes	No

Pump Gearbox Auxiliary Cooler

A pump auxiliary cooler must be provided to maintain safe operating temperatures during prolonged pumping operations for pump rating 1500 GPM and over.

PUMP CERTIFICATION

Pump Certification

The pump, when dry, must be capable of taking suction and discharging water in accordance with current NFPA 1901. The pump must be tested at the manufacturer`s facility by an independent, third-party testing service. The conditions of the pump test must be as outlined in current NFPA 1901.

The tests must include, at a minimum, the pump test, the pumping engine overload test, the pressure control system test, the priming device tests, the vacuum test, and the water tank to pump flow test as outlined in current NFPA 1901.

A piping hydrostatic test must be performed as outlined in current NFPA 1901.

The pump must deliver the percentage of rated capacities at pressures indicated below:

- 100% of rated capacity at 150 psi net pump pressure
- 100% of rated capacity at 165 psi net pump pressure
- 70% of rated capacity at 200 psi net pump pressure
- 50% of rated capacity at 250 psi net pump pressure

A test plate, installed at the pump panel, must provide the rated discharges and pressures together with the speed of the engine as determined by the certification test, and the no-load governed speed of the engine.

A Certificate of Inspection certifying performance of the pump and all related components must be provided at time of delivery. Additional certification documents must include, but not limited to, Certificate of Hydrostatic Test, Electrical System Performance Test, Manufacturer`s Record of Pumper Construction, and Certificate of Pump Performance from the pump manufacturer.

PUMP OPTIONS

Zinc Anodes

The zinc anodes help prevent damage caused by galvanic corrosion within the fire pump. The system provides a sacrificial metal which helps to diminish or prevent pump and pump shaft

	Bidder Complies	
	Yes	No

galvanic corrosion. One anode must be located on the suction side and one must be located on the discharge side of the pump.

Pump Seal Packing

The pump shaft must have only one (1) packing gland located on the inlet side of the pump. It must be of split design for ease of repacking. The packing gland must be of a design to exert uniform pressure on packing and to prevent cocking and uneven packing load when tightened. The packing rings must be permanently lubricated, graphite composition and have sacrificial zinc foil separators to protect the pump shaft from galvanic corrosion.

The packing must be easily adjusted by hand with rod or screw driver with no special tools or wrenches required.

Master Drain Valve

A manual master drain valve must be installed on the pump panel. The master pump drain assembly must consist of a Class 1 bronze master drain with a rubber disc seal. The master drain must have a rubber seal to prevent water from running out on the running board.

The manual master drain valve must have twelve (12) individual-sealed ports that allow quick and simultaneous draining of multiple intake and discharge lines. It must be constructed of corrosion-resistant material and be capable of operating at a pressure of up to 600 PSI.

The master drain must provide independent ports for low point drainage of the fire pump and auxiliary devices.

Trident Air Primer

A Trident air operated priming system must be installed. The unit must be of all brass and stainless steel construction and designed for fire pumps of 1,250 GPM (4,600 LPM) or more. Due to corrosion exposure no aluminum or vanes must be used in the primer design. The primer must be three-barrel design with ¾" NPT connection to the fire pump.

The primer must be mounted above the pump impeller so that the priming line must automatically drain back to the pump. The primer must also automatically drain when the panel control actuator is not in operation. The inlet side of the primer must include a brass "wye" type strainer with removable stainless steel fine mesh strainer to prevent entry of debris into the primer body.

The system must create vacuum by using air from the chassis air brake system through a two-barrel multi-stage internal "venturi nozzles" within the primer body. The noise level during operation of the primer must not exceed 75 Db.

	Bidder Complies	
	Yes	No

Air Flow Requirements

The primer must require a minimum of 15.6 cubic foot per minute air compressor and must be capable of meeting drafting requirements at high idle engine speed. The air supply must be from a chassis supplied "protected" air storage tank with a pressure protection valve. The air supply line must have a pressure protection valve set between 70 to 80 PSIG.

Primer Control

The primer control must have a manually operated, panel mounted "push to prime" air valve. The valve must direct air pressure from the air brake storage tank to the primer body. To prevent freezing, no water must flow to and from the panel control.

Air Primer Warranty

The Trident Air primer must be covered by a five (5) year manufacturer's warranty.

INTAKES

Steamers, Flush+1

The pump 6" steamer intake(s) must be mounted approximately 1" from the pump panel to back of cap when installed. The "Flush+1" dimension can vary + or - 1-1/4" or as practicable depending on the pump module width and options selected. The intakes must be fitted with a six inch (6") to four inch (4") stortz connector with a locking cap.

Location: driver's side, officer's side.

Inlet Valve

A Master Intake Valve (MIV) must be provided and installed behind the pump panel. The large diameter inlet valve must be capable of achieving an NFPA test rating of 1500 GPM through a single 6" suction hose.

The inlet valve must be operated by a manual handwheel control located on the driver's side panel and control water inlet from either six inch (6") steamer intake. The gear actuator on the valve must cycle from full closed to full open in not less than 3 seconds.

An indicator light panel must be located at the pump operator`s position to show valve open, closed, or traversing from open to closed.

	Bidder Complies	
	Yes	No
A built-in adjustable pressure relief valve must be provided. The pressure relief valve must be factory set to 125 psi. The pressure relief valve must provide overpressure protection for the suction hose even when the intake valve is closed. A 3/4" air bleeder valve must be provided and controlled at the pump operator`s position.  A 1/4" water bleeder must be supplied and controlled at the pump operator`s position. Location: driver side pump panel. **Left Side Auxiliary Intake 2.5 Akron Valve** One (1) 2-1/2" suction inlet with a manually operated 2-1/2" Akron valve must be provided on the left side pump panel. The valve must be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve must have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position and water is flowing through it. The valve must be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing. The outlet of the valve must be connected to the suction side of the pump with the valve body located behind the pump panel. The valve must come equipped with a brass inlet strainer, 2-1/2" NST female chrome inlet swivel, and must be equipped with a chrome plated rockerlug plug with a retainer device. The valve control must be located at the pump operator`s panel and must visually indicate the position of the valve at all times. All fabricated piping must be a minimum of Schedule 10 stainless steel for superior corrosion resistance, and decreased friction loss. A 3/4" bleeder valve assembly must be installed on the left side pump panel. **DISCHARGES AND PRECONNECTS** **Front Jump Line 1.5 Akron Valve** One (1) 1-1/2" preconnect outlet with a manually operated Akron valve must be supplied to the extended front bumper. The preconnect must consist of a 2" heavy duty hose coming from the		

	Bidder Complies	
	Yes	No
pump discharge manifold to a 2" FNPT x 1-1/2" MNST mechanical swivel hose connection to permit the use of the hose from either side of the apparatus. The valve must be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve must have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position with water flowing through it. The valve must be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing. An air blow-out valve must be installed between the chassis air reservoir and the front jump line. The control must be installed on the pump operator`s panel. The discharge must be supplied with a Class 1 automatic 3/4" drain valve assembly. The automatic drain must have an all-brass body with stainless steel check assembly. The drain must normally be open and automatically close when the pressure is greater than 6 psi. The valve control must be located at the pump operator panel and must visually indicate the position of the valve at all times. All fabricated piping must be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss. **Swivel Elbow, Polished Stainless Steel** There must be a polished stainless steel swivel elbow provided for the front bumper discharge located on top of the bumper driver's side of center tray. **Deck Gun 3" Discharge Akron Valve** One (1) 3" deck gun discharge outlet with a manually operated Akron valve and 3" stainless steel pipe must be provided above the pump compartment. The valve must be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve must have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position with water flowing through it. The valve must be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing. The valve must be equipped with a device that limits the opening and closing speeds to comply with the current edition of NFPA 1901.		

	Bidder Complies	
	Yes	No
The valve control must be located at the pump operator's panel and must visually indicate the position of the valve at all times. All fabricated piping must be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss. **Speedlay Triple-1.5"&2.5" Top Mount Akron Valve** One (1) triple speedlay discharge must be provided. The first two (2) speedlay sections must include one (1) 2" brass swivel with a 1-1/2" NST male hose connection each to permit the use of the hose from either side of the apparatus. One (1) third speedlay section must include one (1) 2-1/2" brass swivel with a 2-1/2" NST male hose connection to permit the use of the hose from either side of the apparatus. The first two (2) speedlays must consist of a 2" heavy duty hose from the pump discharge manifold to the 2" swivel. The discharges must include a 2" manually-operated Akron valve. The third speedlay must consist of one (1) 2-1/2" heavy duty hose from the pump discharge manifold to the 2-1/2" swivel. The third discharge must include a 2-1/2" manually-operated Akron valve. The valve must be of the unique Akron Swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing. The valve control must be located at the pump The valve control must be located at the pump operator panel and must visually indicate the position of the valve at all times. **Left Panel 2.5 Discharge Akron Valve** One (1) 2-1/2" discharge outlet with a manually operated Akron valve must be provided at the left hand side pump panel. The valve must be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve must have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position with water flowing through it. The valve must be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing. The valve control must be located at the pump operator panel and must visually indicate the position of the valve at all times.		

	Bidder Complies	
	Yes	No
All fabricated piping must be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss. Location: left side discharge 1 **Right Panel 2.5 Discharge Akron Valve** One (1) 2-1/2" discharge outlet with a manually operated Akron valve must be provided at the right side pump panel. The valve must be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve must have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position with water flowing through it. The valve must be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing. The valve control must be located at the pump operator panel and must visually indicate the position of the valve at all times. All fabricated piping must be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss. Location: right side discharge 2 **Left Rear 1.5 Discharge Akron Valve** One (1) 1-1/2" discharge outlet with a manually operated Akron valve must be supplied to the left rear of the apparatus by a 2" stainless steel pipe. The valve must be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve must have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position with water flowing through it. The valve must be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing. The valve control must be located at the pump operator panel and must visually indicate the position of the valve at all times. All fabricated piping must be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.		

	Bidder Complies	
	Yes	No

Location: Left rear discharge.

Right Rear 2.5 Discharge Akron Valve

One (1) 2-1/2" discharge outlet with a manually operated Akron valve must be supplied to the right rear of the apparatus by a 2-1/2" stainless steel pipe.

The valve must be an Akron 8800HD series with a 316 stainless steel ball and dual polymer seats for ease of operation and increased abrasion resistance. The valve must have a self-locking ball feature using an automatic friction lock design to balance the stainless steel ball when in a throttle position with water flowing through it.

The valve must be of the unique Akron swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing.

The valve control must be located at the pump operator panel and must visually indicate the position of the valve at all times.

All fabricated piping must be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Location: right rear discharge.

4" Panel Discharge Electric Akron

One (1) 4" panel discharge with an Akron electric actuated valve must be provided.

The valve must be 4" Akron 8800HD series with bronze flat ball and polymer seals for ease of operation and increased abrasion resistance. The valve must have a self-locking ball feature using an automatic friction lock design to balance the brass ball when in a throttle position with water flowing. The valve must be of the unique Akron Swing-out design to allow the valve body to be removed for servicing without disassembling the plumbing. The end of the discharge outlet must be equipped with a chrome-plated, rocker-lug cap with a retainer.

The valve must utilize an electric driven worm gear actuator. The valve may also be operated manually in case of electrical system failure.

All fabricated piping must be a minimum of Schedule 10 stainless steel for superior corrosion resistance and decreased friction loss.

Location: right side discharge 1.

	Bidder Complies	
	Yes	No

Decontamination Discharge

A .75" decontamination discharge outlet must be provided on the driver side pump panel. The outlet must include a 1/4 turn valve, US standard garden hose bib connection and pressure reducing valve.

DISCHARGE OPTIONS

Color Coding

Each discharge valve must be labeled with a color code to match the discharge port that it controls. Color choices must be finalized prior to production by WFD personnel.

Extend-A-Gun Deck Gun

A Task Force Tips 18" Extend-A-Gun piping must be supplied for the deck gun discharge to allow for raising and lowering the deck gun monitor.

The Extend-A-Gun must include a raised monitor sensor connected to the door ajar light.

The maximum height of the apparatus and all topside protrusions must not exceed: 9feet – 11inches (119"). Must be capable of fitting under a ten foot (10') height restricted railroad overpass.

Deck Gun

One (1) Elkart Brass Stinger 2.0 Model 8297 Dual purpose break apart 1250 GPM monitor for use as a deck gun or portable monitor. The portable base must be fitted carbide tipped, spring loaded ground spikes, a safety tie down strap and a four inch (4") stortz connector on the input side.

Deck Gun Nozzle

One (1) Elkart Brass Solid Bore Quad Stacked Tip with Stream Shaper must be supplied. Each tip must be engraved with the appropriate pressure and flow chart.

Deck Gun Location

Deck gun piping must be positioned centered in deck gun channel. This location must allow for optimal operation of a deck gun monitor once installed.

	Bidder Complies	
	Yes	No

IC Push/Pull Control

The apparatus pump panel must be equipped with Innovative Controls Side Mount Valve Controls. The ergonomically designed ¼ turn push-pull T-handle must be chrome-plated zinc with recessed labels for color-coding and verbiage. An anodized aluminum control rod and housing must, together with a stainless spring steel locking mechanism, eliminate valve drift. Teflon impregnated bronze bushings in both ends of the rod housing must minimize rod deflection, never need lubrication, and ensure consistent long-term operation. The control assembly must include a decorative chrome-plated zinc panel-mounting bezel with areas for color-coding and/or FOAM and CAFS identification labels.

Bleeder Drain Valve [Qty: 10]

The bleeder/drain valves must be Innovative Controls ¾" ball brass drain valves with chrome-plated lift lever handles and ergonomic grips. Each lift handle grip must feature built-in color-coding labels and a verbiage tag identifying each valve, also supplied by Innovative Controls. The color labels must also include valve open and close verbiage.

Discharge/Intake Bezel

Innovative Controls intake and/or discharge swing handle bezels must be installed to the apparatus with mounting bolts. These bezel assemblies must be used to identify intake and/or discharge ports with color and verbiage. These bezel are designed and manufactured to withstand the specified apparatus service environment and must be backed by a warranty equal to that of the exterior paint and finish. The specified assemblies feature a chrome-plated panel-mount bezel with durable UV resistant polycarbonate inserts. These UV resistant polycarbonate graphic inserts must be sub-surface screen printed to eliminate the possibility of wear and protect the inks from fading. All insert labels must be backed with 3M permanent adhesive (200MP), which meets UL969 and NFPA standards.

Akron Electric Valve 9333 Controller

An Akron Brass Style 9333 Valve Controller must be provided with a five year manufacturer warranty. The display must be a full color LCD display with a backlight and manual adjustment of the brightness as well as an auto-dimming option. The electric controls must provide true position feedback, requiring no clutches in the motor or current limiting. The unit must be sealed with momentary open, close as well as an optional one touch full open feature to operate the actuator. The controller must provide an LCD display showing valve position indication and have up to three preset locations that can be user set and easily recalled upon each use. Valve position indication must be determined from true position feedback and indicate the exact position of the valve.

	Bidder Complies	
	Yes	No

Two additional buttons must be available to be used for preset selection, preset activation and menu navigation.

Locate on pump operator panel to control right side 4" discharge 1.

PRESSURE GOVERNORS

FRC PumpBoss Pressure Governor

Fire Research PumpBoss model PBA400 series pressure governor and monitoring display kit must be installed. The standard kit must include a control module, pump discharge pressure sensor, and cables. The control module case must be waterproof and have dimensions not to exceed 6-3/4" high by 4-5/8" wide by 1-3/4" deep. Inputs for engine information must be from a J1939 databus or from independent sensors and pump discharge pressure input must be from a pressure sensor.

The following continuous displays must be provided:

* CHECK ENGINE and STOP ENGINE warning LEDs.
* Engine RPM; shown with four daylight bright LED digits more than 1/2" high.
* Engine OIL PRESSURE; shown on an LED bar graph display in 10 psi increments.
* Engine TEMPERATURE; shown on an LED bar graph display in 10 degree increments.
* BATTERY VOLTAGE; shown on an LED bar graph display in 0.5 volt increments.
* PSI / RPM setting; shown on a dot matrix message display.
* PSI and RPM mode LEDs.
* THROTTLE READY LED.

A dot-matrix message display must show diagnostic and warning messages as they occur. It must show monitored apparatus information, stored data, and program options when selected by the operator.

The program must store the accumulated operating hours for the pump and engine, previous incident hours, and current incident hours in a non-volatile memory. Stored elapsed hours must be displayed at the push of a button. It must monitor inputs and support audible and visual warning alarms for the following conditions:

* Low Oil Pressure
* High Engine Coolant Temperature
* High Transmission Temperature
* Low Battery Voltage (Engine Off)
* Low Battery Voltage (Engine Running)
* High Battery Voltage
* High Engine RPM

	Bidder Complies	
	Yes	No
The governor must operate in two control modes; pressure and RPM. No discharge pressure or engine RPM variation must occur when switching between modes. A control knob that uses optical technology must adjust pressure or RPM settings. It must be 2" in diameter with no mechanical stops, a serrated grip, and have a red idle push button in the center. A throttle ready LED must light when the pump engaged interlock signal is recognized. The governor must be in pressure mode and set the engine RPM to idle. In pressure mode the governor must automatically regulate the discharge pressure at the level set by the operator. In RPM mode the governor must maintain the engine RPM at the level set by the operator except in the event of a discharge pressure increase. The governor must limit a discharge pressure increase in RPM mode to a maximum of 30 PSI. Other safety features must 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 display must be programmed to interface with a specific engine. The display module must be mounted at the pump operator`s panel.  **GAUGES**  **Led Water Tank Level Gauge** One (1) FRC Tankvision Pro 300 or equivalent water tank level gauge must be located at the pump operator`s panel to provide a high-visibility display of the water tank level. Nine (9) high-intensity light emitting diodes (LED`s) on the display module must have a 3-dimensional lens allowing the full, 3/4, 1/2, 1/4, and refill levels to be easily distinguished at a glance within full 180 degree visibility. The display module must be protected from vibration and contamination with the components being encased in an encapsulated plastic housing. The long life and extreme durability of LED indicators eliminates light bulb replacement and maintenance. A color coded cover plate must complete the assembly of the display module to the pump panel. **2.5 Gauges [Qty: 10]** The valve discharge gauges must be 2 ½"(63mm) diameter Innovative Controls pressure gauges. Each gauge must have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge. The gauges must be filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from –40F to +160F. Each gauge must exceed ANSI B40.1 Grade A requirements with an accuracy of +/-		

	Bidder Complies	
	Yes	No

1.5% full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.

A polished chrome-plated stainless steel bezel must be provided to prevent corrosion and protect the lens and gauge case. The gauges must be installed into decorative chrome-plated mounting bezels that incorporate valve-identifying verbiage and/or color labels. The gauges must display a range from 0 to 400 psi with black graphics on a white background.

4" Master Pressure Gauges w/Bezel

The master intake and master discharge gauges must be 4"(101mm) diameter IC pressure gauges. Each gauge must have a rugged corrosion free stainless steel case and clear scratch resistant molded crystals with captive O-ring seals to ensure distortion free viewing and seal the gauge. The gauges must be filled with a synthetic mixture to dampen shock and vibration, lubricate the internal mechanisms, prevent lens condensation and ensure proper operation from –40F to +160F. Each gauge must meet ANSI B40.1 Grade 1A requirements with an accuracy of +/- 1% full scale and include a size appropriate phosphorous bronze bourdon tube with a reinforced lap joint and large tube base to increase the tube life and gauge accuracy.

The two master gauges must be installed into decorative chrome-plated zinc mounting bezel that also incorporates a test port manifold and a graphic overlay that identifies the master intake and discharge gauges, the vacuum test port, and the pressure test port. The test port manifold is solid cast brass with chrome plated plugs. The master gauges must be installed on the pump panel no more than 6 inches apart. The gauge on the left must be the master pump intake gauge and display a range from 30" vac to 400 psi with black graphics on a white background. The gauge on the right must be the master pump discharge gauge and display a range from 0 to 400 psi with black graphics on a white background.

ELECTRICAL SYSTEMS

Vehicle Data Recorder

A vehicle data recorder system must be provided to comply with the 2009 and 2016 editions of NFPA 1901. The following data must be monitored:

- Vehicle speed MPH
- Acceleration (from speedometer) MPH/Sec.
- Deceleration (from speedometer) MPH/Sec.
- Engine speed RPM
- Engine throttle position % of full throttle
- ABS Event On/Off
- Seat occupied status Occupied Yes/No by position
- Seat belt status Buckled Yes/No by position

	Bidder Complies	
	Yes	No

- Master Optical Warning Device Switch On/Off
- Time: 24 hour time
- Date: Year/Month/Day

Occupant Detection System

There must be a visual and audible warning system installed in the cab that indicates the occupant buckle status of all cab seating positions that are designed to be occupied during vehicle movement.

The audible warning must activate when the vehicle's park brake is released and a seat position is not in a valid state. A valid state is defined as a seat that is unoccupied and the seat belt is unbuckled, or one that has the seat belt buckled after the seat has been occupied.

The visual warning must consist of a graphical display that must continuously indicate the validity of each seat position.

The system must include a display panel with LED back-lit ISO indicators for each seating position, seat sensor and safety belt latch switch for each cab seating position, audible alarm and braided wiring harness.

The display panel must be located Driver side of center dash electrical cover.

Wiring

All harnessing, wiring and connectors must be manufactured to the following standards/guidelines. No exceptions.

- NFPA 1901-Standard for Automotive Fire Apparatus
- SAE J1127 and J1127
- IPC/WHMA-A-620 – Requirements and Acceptance for Cable and Wire Harness Assemblies. (Class 3 – High Performance Electronic Products)

All wiring must be copper or copper alloys of a gauge rated to carry 125 of the maximum current for which the circuit is protected. Insulated wire and cable 8 gauge and smaller must be SXL, GXL, or TXL per SAE J1128. Conductors 6 gauge and larger must be SXL or SGT per SAE J1127.

All wiring must be colored coded and imprinted with the circuits function. Minimum height of imprinted characters must not be less than .082" plus or minus .01". The imprinted characters must repeat at a distance not greater than 3".

	Bidder Complies	
	Yes	No
A coil of wire must be provided behind electrical appliances to allow them to be pulled away from mounting area for inspection and service work.		
Wiring Protection		
The overall covering of the conductors must be loom or braid.		
Braid style wiring covers must be constructed using a woven PVC-coated nylon multifilament braiding yarn. The yarn must have a diameter of no less than .04" and a tensile strength of 22 lbs. The yarn must have a service temperature rating of -65 F to 194 F. The braid must consist of 24 strands of yarn with 21 black and 3 yellow. The yellow must be oriented the same and be next to each other.		
Wiring loom must be flame retardant black nylon. The loom must have a service temperature of -40 F to 300 F and be secured to the wire bundle with adhesive-backed vinyl tape.		
Wiring Connectors		
All connectors must be Deutsch series unless a different series of connector is needed to mate to a supplier's component. The connectors and terminals must be assembled per the connector/terminal manufacturer's specification. Crimble/Solderless terminals must be acceptable. Heat shrink style must be utilized unless used within the confines of the cab.		
NFPA Required Testing of Electrical System		
The apparatus must be electrical tested upon completion of the vehicle and prior to delivery. The electrical testing, certifications, and test results must be submitted with delivery documentation per requirements of NFPA 1901. The following minimum testing must be completed by the apparatus manufacturer:		
1. Reserve capacity test:		
The engine must be started and kept running until the engine and engine compartment temperatures are stabilized at normal operating temperatures and the battery system is fully charged. The engine must be shut off and the minimum continuous electrical load must be activated for ten (10) minutes. All electrical loads must be turned off prior to attempting to restart the engine. The battery system must then be capable of restarting the engine. Failure to restart the engine must be considered a test fail.		

	Bidder Complies	
	Yes	No

2. Alternator performance test at idle:

The minimum continuous electrical load must be activated with the engine running at idle speed. The engine temperature must be stabilized at normal operating temperature. The battery system must be tested to detect the presence of battery discharge current. The detection of battery discharge current must be considered a test failure.

3. Alternator performance test at full load:

The total continuous electrical load must be activated with the engine running up to the engine manufacturer`s governed speed. The test duration must be a minimum of two (2) hours. Activation of the load management system must be permitted during this test. However, an alarm sounded by excessive battery discharge, as detected by the system required in NFPA 1901 Standard, or a system voltage of less than 11.7 volts DC for a 12 volt nominal system, for more than 120 seconds, must be considered a test failure.

4. Low voltage alarm test:

Following the completion of the above tests, the engine must be shut off. The total continuous electrical load must be activated and must continue to be applied until the excessive battery discharge alarm activates. The battery voltage must be measured at the battery terminals. With the load still applied, a reading of less than 11.7 volts DC for a 12 volt nominal system must be considered a test failure. The battery system must then be able to restart the engine. Failure to restart the engine must be considered a test failure.

NFPA Required Documentation

The following documentation must be provided on delivery of the apparatus:

A. Documentation of the electrical system performance tests required above.

B. A written load analysis, including:

a. The nameplate rating of the alternator.
b. The alternator rating under the conditions.
c. Each specified component load.
d. Individual intermittent loads.

Multiplex Display

The V-MUX multiplex electrical system must include a text display.

	Bidder Complies	
	Yes	No
The display must have the following features: • Rugged vacuum fluorescent technology • Two twenty character lines • Programmed to show door ajar status and diagnostic information The display must be located in the dash. **Electrical Connection Protection** The vehicle electrical system must be made more robust by the application of a corrosion inhibiting spray coating on all exposed electrical connections on the chassis and body. If equipped with an aerial device, the exposed connections on the aerial components must also be protected. The coating must use nanotechnology to penetrate at the molecular level into uneven surfaces to create a protective water repellant film. The coating must protect electrical connections against the environmental conditions apparatus are commonly exposed to. **LIGHT BARS** **Opticom Traffic Emitter** A GTT (Global Traffic Technology) model 795H LED Opticom must be provided centered in the forward facing Whelen Freedom IV light bar. A switch must be provided accessible to the driver to activate the emitter. The emitter switch must be wired through master warning switch and/or the application of the park brake. **Light Bar Mount** One (1) pair of Whelen 1.5" tall (model MKEZ7) mounts must be provided on the front light bar. **Front Light Bar Color(s)** The front light bar must be provided with the following color LED modules: Red/White with clear lenses If applicable, includes side facing light bars when colors are the same.		

	Bidder Complies	
	Yes	No

Light Bar

A Whelen Freedom IV Series 72" LED light bar model F4X7 with ten (10) LED modules must be provided; two (2) front corner mounted LED modules, six (6) forward facing LED modules and two (2) side facing LED modules (with front vista windows) or two (2) rear corner LED modules (without front vista windows).

No rear facing LEDs.

The light bars must have clear lenses.

The white LEDs (if equipped) must be switched off in blocking right of way mode.

The light bar must be installed centered on the front cab roof.

WARNING LIGHT PACKAGES

Lower Level LED Warning Light Flash Rate

The lower level Federal Signal QuadraFlare and/or FireRay LED warning lights must be set to FedPulse 75 - Simultaneous pattern.

Lower Level Warning

Eight (8) Federal Signal QL64-RR LED light heads and two (2) Federal Signal IPX302-4 LED light heads all with red lenses must be provided.

The light heads must be mounted as close to the corner points of the apparatus (as is practical) as follows:

- Two (2) QL64-RR light heads on the front of the apparatus facing forward.
- Two (2) QL64-RR light heads on the rear of the apparatus facing rearward.
- Two (2) QL64-RR light heads each side of the apparatus, one (1) each side at the forward most point and one (1) centrally located to provide midship warning lighting.
- Two (2) IPX302-4 LED light heads must be mounted one (1) each side at the rearward most point (as practical).

The side facing lights must be located at forward most position, centered in rear wheel well, and side facing at rear of body in rubrail if equipped.

All warning devices must be surface mounted in compliance with NFPA standards.

	Bidder Complies	
	Yes	No

WARNING LIGHTS

Hazard (Door Ajar) Light

There must be a 2" red LED hazard light installed as specified.

The light must be located center overhead.

Upper Rear Warning Lights

Two (2) Whelen model RB6T rotating beacons with Red domes must be supplied. Each light must contain a 60 watt halogen bulb with dual parabolic reflectors and produce 130 FPM.

The lights must be located (1) each side of body on rearward compartment top to meet upper Zone C requirements.

DIRECTIONAL LIGHT BAR

Directional Traffic Warning Light

One (1) Whelen TAL65 or equivalent LED 36" long Traffic Advisor with amber lenses must be provided.

The directional bar must include a TACTLD1 control head. The control head must include a remote flash control and end lamp enable/disable feature.

The light must be installed at the rear of the body to direct traffic around the vehicle.

Directional Light Bar Control Location

The directional light bar control head must be located in the center overhead console offset to driver side.

SIRENS

Electronic Siren

A Whelen 295SLSA1 electronic siren must be installed in the cab. The siren amplifier and control panel module must include a rotary selector for six (6) functions, on/off switch, push button switch for manual siren or air horn tones, and noise canceling microphone.

Electronic Siren Control Location

The electronic siren control must be located in the center overhead console offset to officer side.

	Bidder Complies	
	Yes	No

Mechanical Siren

A Federal Q2B-P siren must be installed inside the front bumper extension. An electric siren brake switch must be located in the cab accessible to the driver.

The siren must be located on the officer's side of front bumper.

Siren Speaker

One (1) electronic siren speaker must be flush mounted as far forward as possible in the front bumper on the driver's side. A painted grille must be provided on the outside of the speaker to prevent road debris from entering the speaker. The speaker must produce a minimum sound output of 120 dB at 10 feet to meet current NFPA 1901 requirements.

The speaker must be located on the driver's side inside the front bumper.

DOT LIGHTING

License Plate Light

One (1) Truck-Lite model 15905 white LED license plate light mounted in a Truck-Lite model 15732 chrome plated plastic license plate housing must be mounted at the rear of the body.

LED Marker Lights

LED clearance/marker lights must be installed as specified.

Upper Cab:

- Five (5) amber LED clearance lights on the cab roof.

Lower Cab:

- One (1) amber LED side turn/marker each side of cab ahead of the front door hinge.

Upper Body:

- One (1) red Trucklite LED clearance light each side, rear of body to the side.

Lower Body:

- Three (3) red Trucklite LED clearance lights centered at rear, recessed in the rub rail.
- One (1) red Trucklite LED clearance light each side at the trailing edge of the apparatus body, recessed in the rub rail.

	Bidder Complies	
	Yes	No

- One (1) amber Trucklite LED clearance/auxiliary turn light each side front of body/module, recessed in the rub rail.

Tail Lights

One (1) Federal Signal model QL64Z-BTT red LED (Light Emitting Diode) light, one (1) Federal Signal model QL64Z-ARROW amber LED light and one (1) Federal Signal QL64Z-BACKUP white LED light must be installed in a Cast 4 housing in a vertical position each side at rear and wired with weatherproof connectors.

Light functions must be as follows:

- LED red running light with red brake light in upper position.
- LED amber populated arrow pattern turn signal in middle position.
- LED white back-up light in lower position.

A one-piece polished aluminum trim casting must be mounted around the three (3) individual lights in a vertical position. The lower space must be used by the 6" x 4" lower NFPA warning light.

LIGHTS - COMPARTMENT, STEP & GROUND

Compartment Light Package

Two (2) Hansen compartment light strips must be mounted in each body compartment greater than 4 cu. ft. Transverse compartments must have four (4) lights located two (2) each side.

Each light bar must include white LEDs mounted with a tough polycarbonate tube enclosure to protect the LED circuit board. The lights must produce 120 lumens per foot and be waterproof up to IP66 rating.

Compartment lights must be wired to a master on/off rocker switch on the cab switch panel.

The wiring connection for the compartment lights must be made with a weather-resistant plug in style connector. A single water and corrosion-resistant switch with a polycarbonate actuator and sealed contacts must control each compartment light. The switch must allow the light to illuminate if the compartment door is open.

Medical/Equipment Cabinet Lighting [Qty: 2]

One (1) Hansen LED compartment light strip must be mounted in the medical/equipment cabinet(s).

	Bidder Complies	
	Yes	No
Each light bar must include white LEDs mounted with a tough polycarbonate tube enclosure to protect the LED circuit board. The lights must produce 120 lumens per foot and be waterproof up to IP66 rating. The light must be controlled by a compartment door switch. **Ground Lights** The apparatus must be equipped with a sufficient quantity of lights to properly illuminate the ground areas around the apparatus in accordance with current NFPA requirements. The lights must be TecNiq model T440 4" circular LED (Light Emitting Diode) with clear lenses mounted in a resilient shock absorbent mount for improved bulb life. The wiring connections must be made with a weather resistant plug in style connector. Ground area lights must be switched from the cab dash with the work light switch. One (1) ground light must be supplied under each side of the front bumper extension if equipped. Lights in areas under the driver and crew area exits must be activated automatically when the exit doors are opened. **LIGHTS - DECK AND SCENE** **Hose Bed Light [Qty: 2]** One (1) Federal Signal GHSCENE flush-mounted scene light with a clear lens must be installed at the front area of the hose bed to provide hose bed lighting per current NFPA 1901. The light must include (2) 20 watt halogen light fixtures within the light housing. The two light fixtures must be adjustable horizontally and vertically to provide the desired coverage. All electrical connectors are to be enclosed in the housing providing protection against the elements. The hose bed light must be switched with work light switch in the cab. **Scene Lights** Two (2) Whelen model M6ZC series Linear Super LED clear scene lights must be provided. Each must have Linear Super LED diodes with internal light deflecting optics. The internal light deflecting optics must redirect the light without the use of angle brackets. The lights must be located (1) each side of cab, rearward of forward doors, up high and be controlled by a switch in cab accessible to driver (lights on sides of apparatus to be switched separately).		

	Bidder Complies	
	Yes	No

Rear Work Lights

Two (2) FireTech LED lights model FT-WL3500-FT-W must be installed. The lights must produce 1,981 effective lumens and have a white housing. The lights must be switched with work light switch in the cab.

Location: rear body/beavertail area on the trailing edge up high.

LIGHTS - NON-WARNING

Pump Compartment LED Light

An LED light must be provided in the pump compartment area for NFPA compliance. The light must be wired to operate with the work light switch in the cab.

LED Pump Panel Light Package

Three (3) TecNiq model E10 LED lights must be mounted under a light shield directly above each side pump panel. The work light switch in the cab must activate the lights when the park brake is set.

Engine Compartment Light

There must be lighting provided to illuminate the engine compartment area in compliance with NFPA 1901. The light must be an Optronics ILL22 Series LED that has a polycarbonate lens, sealed / waterproof housing and integral switch. The light wiring circuit must activate when the cab is tilted and master power is switched on.

CONTROLS / SWITCHES

Siren Brake Switch

A 12 volt momentary switch for Q2B brake must be provided. The switch must be appropriately labeled and located on the officer's side dash switch panel.

MISC ELECTRICAL

Back-Up Alarm

An electronic back-up alarm must be supplied. The 97 dB alarm must be wired into the chassis back-up lights to signal when the vehicle is in reverse gear.

	Bidder Complies	
	Yes	No

12 Volt DC Power Distribution Module

A Blue Sea model 5032 12 place, split bus fuse block with ground, 12 volt DC power distribution module must be provided. The module must provide two isolated groups of six circuits, and must be wired through switched hot and battery hot, and include a battery ground.

Location: behind officer's seat.

Pump Panel Mounted Speaker

A truck base radio speaker must be mounted in the area of the pump panel for external broadcast of radio communications. The speaker must be protected from the weather.

LIGHTS - QUARTZ

Cab Brow Light

One (1) FireTech 12V LED model FT-B-72-ML-W 72" white housing brow light with integral marker lights must be provided. The light must be installed on the front cab brow in place of the standard DOT marker lights. the light must feature 54 LEDs` producing 19,665 usable lumens and five (5) DOT approved marker lights. The 285W 12V light must draw 23.75 amps.

RECEPTACLES

Receptacle

A 20 amp, 110 volt 3-prong straight blade NEMA 5-20 duplex household receptacle with stainless steel cover plate must be installed in a non-weather exposed area as specified by the department. The receptacle must be wired to the inlet receptacle where it must have overcurrent protection from an external source.

Location: rear wall of driver side medical compartment up high, rear wall of officer side equipment compartment up high.

MISC LOOSE EQUIPMENT

DOT Required Drive Away Kit

Three (3) triangular warning reflectors with carrying case must be supplied to satisfy the DOT requirement.

	Bidder Complies	
	Yes	No

EXTERIOR PAINT

Painted Pump/Pre-Connect Module(s)

The apparatus pump/pre-connect module(s) must be painted job color.

The paint process must match what is applied to the body.

Paint Custom Cab

The apparatus cab must be painted Sikkens As Specified (Does not include metallic paint). The paint process must meet or exceed current state regulations concerning paint operations. Pollution control must include measures to protect the atmosphere, water, and soil. Contractor must, upon demand, provide evidence that the manufacturing facility is in compliance with State EPA rules and regulations.

The aluminum cab exterior must have no mounted components prior to painting to assure full coverage of metal treatments and paint to the exterior surfaces. Cab doors and any hinged smooth-plate compartment doors must be painted separately to assure proper paint coverage on cab, door jambs and door edges.

Paint process must feature Sikkens high solid LV products and be performed in the following steps:

- Corrosion Prevention - all aluminum surfaces must be pre-treated with the Alodine 5700 conversion coating to provide superior corrosion resistance and excellent adhesion of the base coat.
- Sikkens Sealer/Primer LV - acrylic urethane sealer/primer must be applied to guarantee excellent gloss hold-out, chip resistance and a uniform base color.
- Sikkens High Solid LVBT650 (Base coat) - a lead-free, chromate-free high solid acrylic urethane base coat must be applied, providing excellent coverage and durability. A minimum of two (2) coats must be applied.
- Sikkens High Solid LVBT650 (Clear coat) - high solid LV clear coat must be applied as the final step in order to ensure full gloss and color retention and durability. A minimum of two (2) coats must be applied.

Any location where aluminum is penetrated after painting, for the purpose of mounting steps, hand rails, doors, lights, or other specified components must be treated at the point of penetration with a corrosion inhibiting pre-treatment (ECK Corrosion Control). The pre-treatment must be applied to the aluminum sheet metal or aluminum extrusions in all locations where the aluminum has been penetrated. All hardware used in mounting steps, hand rails, doors, lights, or other specified components must be individually treated with the corrosion inhibiting pre-treatment.

	Bidder Complies	
	Yes	No
After the paint process is complete, the gloss rating of the unit must be tested with a 20 degree gloss meter. Coating thickness must be measured with a digital MIL gauge and the orange peel with a digital wave scan device.		

Paint Body Small

The apparatus body must be painted Sikkens As Specified (Does not include metallic paint). The paint process must meet or exceed current state regulations concerning paint operations. Pollution control must include measures to protect the atmosphere, water, and soil. Contractor must, upon demand, provide evidence that the manufacturing facility is in compliance with State EPA rules and regulations.

The aluminum body exterior must have no mounted components prior to painting to assure full coverage of metal treatments and paint to the exterior surfaces of the body. Any vertically or horizontally hinged smooth-plate compartment doors must be painted separately to assure proper paint coverage on body, door jambs and door edges.

Paint process must feature Sikkens high solid LV products and be performed in the following steps:

- Corrosion Prevention - all aluminum surfaces must be pre-treated with the Alodine 5700 conversion coating to provide superior corrosion resistance and excellent adhesion of the base coat.
- Sikkens Sealer/Primer LV - acrylic urethane sealer/primer must be applied to guarantee excellent gloss hold-out, chip resistance and a uniform base color.
- Sikkens High Solid LVBT650 (Base coat) - a lead-free, chromate-free high solid acrylic urethane base coat must be applied, providing excellent coverage and durability. A minimum of two (2) coats must be applied.
- Sikkens High Solid LVBT650 (Clear coat) - high solid LV clear coat must be applied as the final step in order to ensure full gloss and color retention and durability. A minimum of two (2) coats must be applied.

Any location where aluminum is penetrated after painting, for the purpose of mounting steps, hand rails, doors, lights, or other specified components must be treated at the point of penetration with a corrosion inhibiting pre-treatment (ECK Corrosion Control). The pre-treatment must be applied to the aluminum sheet metal or aluminum extrusions in all locations where the aluminum has been penetrated. All hardware used in mounting steps, hand rails, doors, lights, or other specified components must be individually treated with the corrosion inhibiting pre-treatment.

After the paint process is complete, the gloss rating of the unit must be tested with a 20 degree gloss meter. Coating thickness must be measured with a digital MIL gauge and the orange peel with a digital wave scan device.

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Bid2019-274 Fire Department Pumper

	Bidder Complies	
	Yes	No

Painted Wheels

The exterior outer chassis wheels must be painted Job Color. The paint must be of the highest quality finish for low maintenance, long life, and attractive appearance. The finish must consist of a corrosion-resistant primer, urethane high build primer, and high performance durable color coat.

The paint process must meet or exceed current State regulations concerning paint operations. Pollution control must include measures to protect the atmosphere, water and soil. Manufacturer must, upon demand, provide evidence that the manufacturing facility is in compliance with State EPA rules and regulations.

Paint process must feature Akzo-Nobel's high solid LV products and be performed in the following steps:

- Corrosion Prevention - all raw material must be pre-treated with the Weather Jacket Corrosion Prevention system to provide superior corrosion resistance and excellent adhesion of the top coat.
- Akzo-Nobel Sealer/Primer LV - acrylic urethane sealer/primer must be applied to guarantee excellent gloss hold-out, chip resistance and a uniform base color.
- Akzo-Nobel High Solid LV (Top coat) - a lead-free, chromate-free high solid acrylic urethane top coat must be applied, providing excellent coverage and durability. A minimum of two (2) coats must be applied.
- Akzo-Nobel High Solid LV (Clear coat) - high solid LV clear coat must be applied as the final step in order to ensure full gloss and color retention and durability. A minimum of two (2) coats must be applied.

Undercoating

Undercoating must consist of a heavy coating of soft seal film sprayed on the entire underside of the vehicle to repel water and road elements. Must be applied after customer final inspection.

INTERIOR PAINT

Cab Interior Paint

The interior of the cab must be painted Zolatone gray #20-64. Prior to painting, all exposed interior metal surfaces must be pretreated using a corrosion prevention system.

STRIPING

Striping

Reflective striping must be provided and installed by the dealer.

	Bidder Complies	
	Yes	No

Rear Body Scotchlite Striping

Individual chevron style Scotchlite striping must be provided on the rear of the apparatus. The stripes must consist of 6" Ruby Red/Lemon Yellow alternating stripes in an "A" pattern. The striping must be located on the rear facing extrusions, panels and doors inboard and outboard of the beavertails if applicable.

Designated Standing / Walking Area Indication

1" wide yellow perimeter marking consisting of individual Reflexite diamonds must be applied to indicate the outside edge of designated standing and walking areas above 48" from the ground in compliance with 2016 NFPA 1901. Steps, ladders and areas with a railing or structure at least 12" high are excluded from this requirement.

SUPPORT, DELIVERY, INSPECTIONS AND MANUALS

Approval Drawings

A general arrangement drawing depicting the vehicles appearance must be provided. The drawing must consist of left side, right side, front, and rear elevation views.

Vehicles requiring pump controls must include a general arrangement view of the pump operator`s position, scaled the same as the elevation views.

Electronic Manuals

Two (2) copies of all operator, service, and parts manuals MUST be supplied at the time of delivery in digital format -NO EXCEPTIONS! The electronic manuals must include the following information:

- Operating Instructions, descriptions, specifications, and ratings of the cab, chassis, body, aerial (if applicable), installed components, and auxiliary systems.
- Warnings and cautions pertaining to the operation and maintenance of the fire apparatus and firefighting systems.
- Charts, tables, checklists, and illustrations relating to lubrication, cleaning, troubleshooting, diagnostics, and inspections.
- Instructions regarding the frequency and procedure for recommended maintenance.
- Maintenance instructions for the repair and replacement of installed components.
- Parts listing with descriptions and illustrations for identification.
- Warranty descriptions and coverage.

The electronic document must incorporate a navigation page with electronic links to the operator`s manual, service manual, parts manual, and warranty information, as well as

	Bidder Complies	
	Yes	No
instructions on how to use the manual. Each copy must include a table of contents with links to the specified documents or illustrations. The electronic document must be formatted in such a manner as to allow not only the printing of the entire manual, but to also the cutting, pasting, or copying of individual documents to other electronic media, such as electronic mail, memos, and the like. A find feature must be included to allow for searches by text or by part number. These electronic manuals must be accessible from any computer operating system capable of supporting portable document format (PDF). Permanent copies of all pertinent data must be kept file at both the local dealership and at the manufacturer`s location. NOTE: Engine overhaul, engine parts, transmission overhaul, and transmission parts manuals are not included. **Fire Apparatus Safety Guide** Fire Apparatus Safety Guide published by FAMA, latest edition. This safety manual is intended to point out some of the basic safety situations that may be encountered during the normal operation and maintenance of a fire apparatus and to suggest possible ways of dealing with these situations. This manual is NOT a substitute for the E-ONE`s fire apparatus operator and maintenance manuals or commercial chassis manufacturer`s operator and maintenance manuals. **WARRANTY / STANDARD & EXTENDED** **Standard 1 Year Warranty** The apparatus manufacturer must provide a full 1-year standard warranty. All components manufactured by the apparatus manufacturer must be covered against defects in materials or workmanship for a 1-year period. All components covered by separate suppliers such as engines, transmissions, tires, and batteries must maintain the warranty as provided by the component supplier. A copy of the warranty document must be provided with the proposal. **Lifetime Frame Warranty** The apparatus manufacturer must provide a full lifetime frame structural warranty. This warranty must cover all apparatus manufacturer designed frame, frame members, and cross-members against defects in materials or workmanship for the lifetime of the covered apparatus. A copy of the warranty document must be provided with the proposal. Frame warranties that do not cover cross-members for the life of the vehicle must not be acceptable.		

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Bid2019-274 Fire Department Pumper

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	Yes	No
10 Year 100,000 Mile Structural Warranty The apparatus manufacturer must provide a comprehensive 10 year/100,000 mile structural warranty. This warranty must cover all structural components of the cab and/or body manufactured by the apparatus manufacturer against defects in materials or workmanship for 10 years or 100,000 miles, whichever occurs first. Excluded from this warranty are all hardware, mechanical items, electrical items, or paint finishes. A copy of the warranty document must be provided with the proposal. **10 Year Stainless Steel Plumbing Warranty** The apparatus manufacturer must provide a full 10-year stainless steel plumbing components warranty. This warranty must cover defects in materials or workmanship of apparatus manufacturer designed foam/water plumbing system stainless steel components for 10 years. A copy of the warranty document must be provided with the proposal. **10 Year Paint and Corrosion Warranty** The apparatus manufacturer must provide a 10-year limited paint and corrosion perforation warranty. This warranty must cover paint peeling, cracking, blistering, and corrosion provided the vehicle is used in a normal and reasonable manner. The paint must be prorated for 10 years as follows: **Topcoat & Appearance:** (Gloss, Color Retention, Cracking) 0 to 72 months 100% 73 to 120 months 50% **Coating System, Adhesion & Corrosion:** (Includes Dissimilar metal corrosion, Flaking, Blistering, Bubbling) 0 to 36 months 100% 37 to 84 months 50% 85 to 120 months 25% Corrosion perforation must be covered 100% for 10 years. Corrosion perforation is defined as complete penetration through the exterior metal of the apparatus. The warranty period must begin upon delivery of the apparatus to the original user-purchaser. A copy of the warranty document must be provided with the proposal. UV paint fade must be covered in a separate warranty supplied by Akzo Nobel (Sikkens) and must be for a minimum of 10 years.		

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25 Year Frame Rail Corrosion Warranty

The chassis manufacturer must provide a 25 year corrosion warranty on the chassis frame rails. This warranty must cover the chassis frame rails, including frame rail liners (if equipped), for a period of 25 years after the date on which the vehicle is delivered to the original purchaser. A copy of the warranty document must be provided with the proposal. Please refer to warranty document for complete details and exclusions.

20 Year Frame Components Corrosion Warranty

The chassis manufacturer must provide a 20 year corrosion warranty on the galvanized chassis frame components. This warranty must cover the front frame extensions, chassis crossmembers (from engine rearward), battery tray brackets and rear underbody support (if applicable) for a period of 20 years after the date on which the vehicle is delivered to the original purchaser. A copy of the warranty document must be provided with the proposal. Please refer to warranty document for complete details and exclusions.

Meritor Front Axle Warranty

A 5-year/unlimited miles, 5-year parts and 5-year labor **front non-drive steer** axle warranty must be provided by Meritor Automotive or a 2-year/unlimited miles, 2-year parts and 2-year labor **front drive steer** axle warranty must be provided by Meritor Automotive.

Meritor Rear Axle Warranty

A 5-year/unlimited miles, 5-year parts and 5-year labor rear drive single or rear drive tandem axle warranty must be provided by Meritor Automotive.

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	Bidder Complies	
	Yes	No