CITY OF MURRAY FIRE DEPARTMENT

2022 NEW FIRE PUMPER SPECIFICATIONS

Eric Pologruto – Fire Chief

INVITATION TO BID

City of Murray Kentucky
500 Main Street
Murray, KY 42071

Sealed bids shall be **received** at Murray City Hall Building located at: 500 Main Street Murray, Kentucky 42071 no later than 2:00 p.m., CST, on May 20, 2022. The **bid opening** will be held at City Hall located at: 500 Main Street at 2:00 p.m., CST on May 20, 2022 at which time the bids will be opened and read aloud publicly in the Council Chambers at the said address.

The following pages contain the Invitation for Bid, General Conditions, and Specifications. Please advise if any of the documents are not received.

The Mayor and City Council may reject any part of, or all bids, and waive informalities, technicalities, or negotiate directly with any party submitting a bid. The City of Murray may accept any bid to be in its best interest, whether or not it is the lowest dollar proposal.

Any and all bids not prepared and submitted in accordance with provisions of this advertisement and/or specifications may be rejected by the City of Murray.

GENERAL CONDITIONS

1. INSTRUCTIONS, SPECIFICATIONS AND FORMS: Instructions, specifications and forms may be obtained via email Eric.pologruto@murrayky.gov.

   (a) All bids shall be submitted on the provided Bid Forms. The form must be signed and dated in the appropriate spaces or the bid will be rejected.

   (b) Each bid must be submitted in a sealed envelope, clearly and prominently marked on the outside of the envelope with the following:

   BID #22FD13 Pumper Truck Attn: City Clerk

   (c) Sealed bids will be received in person or via official mail. If sending through the mail, ensure the package is clearly marked (as stated above), and send Attn: City Clerk - 500 Main Street Murray, KY 42071. Always allow for sufficient time to reach the address prior to the scheduled closing time for receipt of bids. Late bids will not be accepted for any reason and will be returned to the bidder unopened.

   (d) Additional information or clarification of any of the instructions or information contained herein may be obtained from Chief Pologruto.

   (e) The successful bidder must have or obtain a City of Murray business license prior to the official award of the bid/contract.

(f) Any bidder may withdraw the bid, either in person or in writing at any time prior to the scheduled time for closing the receipt for bids. Withdrawals after the scheduled time for closing the receipt of bids will not be permitted.

2. AWARD OF CONTRACTS

(a) All bids will be considered on the basis of best value to the City of Murray and compliance with the General Conditions and conformance with the specifications.

(b) The City of Murray reserves the right to reject any or all bids received, waive informalities, and technicalities or negotiate directly with any party.

(c) The City may accept the bid they deem to be in its best interest, whether or not it is the lowest dollar proposal.

(d) Any other considerations or basis for consideration of award will be stated in the specifications.

(e) The City Procurement Specialist reserves the right to award contracts or place orders to a single source or divide awards and orders or enact combinations that are in the best interest of the City of Murray.

3. COMPETITION

In order to assure fair competition and to permit determination of the best bid:

(a) Bids that show omission, irregularity and alteration of forms or additions that were not requested or conditional and unconditional bids or unresponsive, unbalanced bids may be rejected.

(b) All bids shall be accompanied by such descriptive literature and documentation that are requested in the specifications or the bid may be rejected.

(c) Specifications provided are based on the City of Murray needs and uses, estimated costs of operation and maintenance, and other significant and/or limiting factors to meet City of Murray requirements and shall be consistent with City policies. Minimum and/or maximum specifications are not established to limit competition or to exclude competitive bidders. Specifications are used to designate a standard and for no other reason.

4. DISPUTES

In cases of disputes as to whether or not an item, service or delivered product meets specifications, the decision of the Mayor, or authorized representative, shall be final and binding on all parties.

5. BID BINDING

The submission of a bid shall be considered an agreement to all the terms, conditions, and specifications provided herein and in the various bid documents, unless specifically noted otherwise in the space provided on the Bid Form.

Any bid may be withdrawn prior to the scheduled time for the opening of the bids or authorized postponement thereof. No bidder may with draw a bid within sixty (60) days after the actual date of the opening thereof.

6. UNIT PRICING

Unit pricing shall include all delivery fees to the specified destination, (if applicable). Cost plus a percentage is not acceptable.

7. SAMPLES

Sample(s) must be furnished free of cost to the City. If the samples are not destroyed by testing or other means, the bidder may request, in writing, that the sample(s) received are returned to the Bidder at the Bidders expense. If no return request is received, the samples will be discarded.

9. BIDDER'S RESPONSIBILITY

The City of Murray will hold each bidder responsible to perform their due diligence with all specifications listed in the bid packet/contract and to comply with all federal, state, local laws, and regulations applicable to the bid and any subsequent contract.

10. TAXES

The City of Murray is tax exempt and will provide a tax-exempt form to the successful bidder.

11. HOLD HARMLESS AGREEMENT

The contractor shall indemnify, defend and to hold harmless the City, its agents and employees from and against all claims, damages, losses, and expenses including attorney's fees arising from the execution under this contract.

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City of Murray Kentucky Fire Department
Pumper Specifications

SECTION 1 – GENERAL

The City of Murray currently owns a Pierce Contender pumper. This truck's design has been generally used as the framework to draft the specifications within this document. This is not meant to limit another manufacturer's ability to submit a bid. Consideration will be given to all apparatus manufacturer's whose specifications are equivalent or exceed the specifications contained in this document.

Bids are requested for one custom fire pumper apparatus, with a four-person, full tilt cab.

The manufacturer, who is awarded the bid, shall meet with a Fire Department representative to review the apparatus, installed equipment, and to ensure the specifications (model numbers, sizes, etc.) are the most appropriate, as to ensure the completed apparatus functions at the most appropriate performance levels.

1-1 Intent

The apparatus shall comply with all Federal, State, I.C.C. and D.O.T. regulations, standards, and laws relating to commercial vehicles as well as to fire apparatus.

Any error, omission, or inconsistency that is identified by the bidder shall be listed as such in the exceptions, and a proposal to meet the intent of the specifications shall be listed.

Bids shall only be considered from companies that have an established reputation in the field of fire apparatus construction and have been in business for a minimum of 20 years. Further, bidder shall maintain dedicated service facilities for the repair and service of products. Evidence of such a facility shall be included in bidder proposal.

Each bid shall be accompanied by a detailed set of Contractor's Specifications consisting of a detailed description of the apparatus and equipment proposed, and to which the apparatus furnished under contract shall conform. These specifications shall indicate size, type, model and make of all component parts and equipment.

1-2 Bid Requirements

Bidders shall also clearly indicate any item that does not meet the specification of this bid. All exceptions must be fully explained in Section 37. Any exceptions not taken shall be assumed by the purchaser to be included in the proposal, regardless of the cost to the bidder.

Bid responses and the "Bidder Questionnaire" shall be responded to in their entirety.

1-3 NFPA Standards

This apparatus and associated equipment shall comply with the most current applicable NFPA standards. Any specifications that differ from NFPA specifications shall be indicated in the proposal as "non-NFPA" in Section 37. Items not described in this specification for construction or performance, or in NFPA 1901, may be accepted as the standard of the bidder who shall be solely responsible for the design, construction, and performance of apparatus and equipment. Some items in the specifications may exceed NFPA standards and will be considered minimum for compliance.

All surfaces used for stepping, standing and walking shall be certified as slip resistance. This documentation shall be supplied with delivery of the apparatus.

A plate that is highly visible to the driver while seated shall be provided. This plate shall show the overall height, length, and gross vehicle weight rating.

The manufacturer shall have a training program that tests the proficiency and performance for any staff involved with certifications.

The manufacturer shall designate in writing the qualified representative who witnessed and certified the test results.

1-4 General Construction

The apparatus shall be designed with due consideration to distribution of load between the front and rear axles. Weight balance and distribution shall be in accordance with the recommendations of the National Fire Protection Association. It is preferable that the overall apparatus length shall not exceed 373" and the overall apparatus height not exceed 114". If these measurements cannot be fulfilled, then the Manufacturer and the Fire Chief shall agree on the proposed height and length prior to construction beginning. The apparatus width shall not exceed 118". These maximum measurements include the apparatus, mirrors and installed equipment.

1-5 Quality and Workmanship

The design of the apparatus shall embody the latest approved automotive engineering practices. Special consideration shall be given to the following points: Accessibility of the various units which require periodic maintenance; ease of operation (including both pumping and driving); and symmetrical proportions. Construction shall be rugged and ample safety factors shall be provided to carry the loads specified and to meet both on and off-road requirements and speed conditions as set forth under Performance Tests and Requirements. Welding shall not be employed in the assembly of the apparatus in a manner that shall prevent the ready removal of any component part for service or repair. All steel welding shall follow the most current standard of the American Welding Society for structural steel welding. All aluminum welding shall follow the most current standard of the American Welding Society and ANSI requirements for structural welding of aluminum. All sheet metal welding shall follow the most current standard of the American Welding Society-requirements for structural welding of sheet metal. Employees classified as welders are tested and certified to meet American Welding Society codes. It is preferable that the manufacturer be required to have an American Welding Society certified welding inspector in plant during working hours to monitor weld quality.

1-6 ISO Compliance

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

1-7 Single Source Manufacturer

Bids shall only be accepted from a single source apparatus manufacturer. The definition of single source is a manufacturer that designs and manufactures their products using an integrated approach, including the chassis, cab and body being fabricated and assembled on the bidder's premises. The warranties relative to the chassis and body design (excluding component warranties such as engine, transmission, axles, pump, etc.) must be from a single source

manufacturer and not split between manufacturers (i.e. body and chassis). The bidder shall provide evidence that they comply with this requirement.

1-8 Approval Drawing
A drawing of the proposed apparatus shall be provided for approval before construction begins. The sales representative shall also have a copy of the same drawing. The final and approved drawing shall become part of the contract documents. This drawing shall indicate the chassis make and model, location of the lights, siren, horns, compartments, major components, etc.

Any revised drawings shall be prepared by the bidder/manufacturer and submitted to the fire chief for final approval.

1-9 Electrical

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

1-10 Loose Equipment
The manufacturer shall provide loose equipment in accordance with the current edition of NFPA 1901 standards.

1-11 Mandatory and Optional Work/Equipment
All items listed in the specifications are to be considered mandatory except items in Sections 36 and 37, which are optional equipment that the fire department may choose to include. The Fire Department has the right to adjust the quantity of these options. Bidders shall submit the cost of each optional piece of equipment. The Fire Department may choose to include all, none, or a portion of the equipment when considering the bid price to determine the award.

1-15 Information Required at Delivery
The manufacturer shall supply at time of delivery, complete operation and maintenance manuals covering the completed apparatus as delivered. A permanent plate shall be mounted in the driver's compartment which specifies the quantity and type of fluids required including engine oil, engine coolant, transmission, pump transmission lubrication, pump primer and drive axle. Documentation provided at the time of delivery shall also include an apparatus safety video, in DVD format. This video shall address key safety considerations for personnel to follow when they are driving, operating, and maintaining the apparatus. Safety procedures for the following shall be included: vehicle pre-trip inspection, chassis operation, pump operation, and maintenance.

1-16 The Right to Reject Bids
The City of Murray reserves the right to reject any and all bids received and accept any bid that, in its judgment, best serves the interest of the township.

1-17 Acceptance

The finished apparatus will be inspected upon delivery for compliance with specifications, proof of required tests, inspections, change orders, and previously authorized exceptions. Deviations are unacceptable and will be cause for rejection of apparatus. Equipment items not delivered at the time of the delivery or not in conformance with the proposal will be cause for the City of Murray to withhold payment until delivery is complete and acceptable.

SECTION 2 - LIABILITY/INSURANCES/BONDS

2-1 Liability

The successful bidder shall defend any and all suits and assume all liability for the use of any patented process including any device or article forming a part of the apparatus or any appliance furnished under the contract.

2-2 Commercial General Liability Insurance

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

Each Occurrence: $1,000,000

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

Personal and Advertising Injury: $1,000,000

General Aggregate: $5,000,000

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

2-3 Commercial Automobile Liability Insurance

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

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

Coverage shall be written on a Commercial Automobile liability form.

2-4 Umbrella/Excess Liability Insurance

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

Aggregate: $25,000,000

Each Occurrence: $25,000,000

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

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

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

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

Insurance with the coverage's listed above along with its bid. The certificate shall show the purchaser as certificate holder.

2-5 Bid Bond

All bidders shall provide a bid bond as security for the bid in the form of a 10% bid bond to accompany their bid. This bid bond shall be issued by a Surety Company who is listed on the U.S. Treasury Departments list of acceptable sureties as published in Department Circular 570. The bid bond shall be issued by an authorized representative of the Surety Company and shall be accompanied by a certified power of attorney dated on or before the date of bid. The bid bond shall include language, which assures that the bidder/principal shall give a bond or bonds as may be specified in the bidding or contract documents, with good and sufficient surety for the faithful performance of the contract, including the Basic Warranty (Section 34-1) after delivery of the vehicle, and for the prompt payment of labor and material furnished in the prosecution of the contract.

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

If the successful bidder does not manufacture the chassis, the bidder shall supply a warranty bond, in addition to their performance bond, along with their signed contract. This warranty bond shall guarantee all terms and conditions of the Basic Warranty and names both the bidder and chassis manufacturer as co-principals. This warranty bond shall be issued for the contract amount and shall remain in force for a term which is consistent with the term of the Basic Warranty (Section 34-1).

Notwithstanding any document or assertion to the contrary, any surety bond related to the sale of a vehicle shall apply only to the Basic Warranty (Section 34-1) for such vehicle. Any surety bond related to the sale of a vehicle shall not apply to any other warranties that are included within this bid (OEM or otherwise) or to the warranties (if any) of any third party of any part, component, attachment or accessory that is incorporated into or attached to the vehicle. In the event of any contradiction or inconsistency between this provision and any other document or assertion, this provision shall prevail.

2-6 Performance Bond

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

Bidder and Bidder's surety agree that the Bond issued hereunder, whether expressly stated or not, also includes the surety's guarantee of the vehicle manufacturer's Basic Warranty (Section 34-1) period included within this proposal. Owner agrees that the penal amount of this bond shall be simultaneously amended to 100% percent of the total contract amount upon satisfactory acceptance and delivery of the vehicle(s) included herein. Notwithstanding anything contained within this contract to the contrary, the surety's liability for any warranties of any type shall not exceed the actual Basic Warranty period (Section 34-1).

SECTION 3 - CHASSIS

3-1 Wheelbase
It is preferable the wheelbase of the vehicle shall be no greater than 193.00 inches.

3-2 GVW Rating
The gross vehicle weight rating shall be a minimum of 40,000 pounds.

3-3 Frame
The chassis frame shall be built with two (2) steel channels bolted to five (5) cross members or more, depending on other options of the apparatus. The side rails shall be heat-treated steel measuring 10.13" x 3.06" x .31".

Each rail shall have a section modulus of 13.48 $in.^3$, yield strength of 120,000 psi, and a resisting bending moment (rbm) of 1,617,600 inch-pounds.

3-4 Frame Reinforcement
In addition to the chassis frame rails, an inverted "L" type outside frame reinforcement shall be provided. The frame reinforcement shall start 19.00" to the rear of the front axle centerline and shall extend back to the rear spring shackles. The frame reinforcement shall be heat-treated steel measuring 9.50" x 3.31" x .25". Total rbm at the wheelbase center shall be 2,140,613 pounds per rail.

3-5 Front Axle
The front axle shall be a reverse "I" beam type with inclined kingpins. It shall be a Meritor™ axle, with a rated capacity of 16,000 pounds.

A viewing window shall be provided on each side of the axle for checking the oil level.

3-6 Suspension Front
Front springs shall be semi-elliptical, 4.00" x 54.00" seven (7)-leaf, constant rate type with a ground rating of 16,000 pounds.

Kaiser spring pins shall be provided, with double figure-eight grease grooves and a layer of electroless nickel plating, 1.0 mil thick around the entire pin. The bushing that holds the spring pin in place shall also have a grease groove.

3-7 Shock Absorbers
Heavy-duty telescoping shock absorbers shall be provided on the front axle.

3-8 Oil Seals
Oil seals with viewing window shall be provided on the front axle.

(10)-stud, 11.25" bolt circle.

3-9 Rear Axle
The rear axle shall be a Meritor™, with a capacity of 24,000 pounds.

3-10 Rear Suspension

The rear springs shall be semi-elliptical, 3.00" x 55.00", 10 leaves with a ground rating of 24,000 pounds. Spring hangers shall be castings with provisions for lubrication. The grease fittings shall be 90-degree type and shall be accessible without removing the wheels or cutting any sheet metal.

Kaiser spring pins shall be provided, with double figure-eight grease grooves and a layer of electroless nickel plating, 1.0 mil thick, around the entire pin. The bushing that holds the spring pin in place shall also have a grease groove.

3-11 Oil Seals

Oil seals shall be provided on the rear axle.

3-12 Bumper

A one (1)-piece, ten (10) gauge, 304-2B type polished stainless-steel bumper, a minimum of 10.00" high, shall be attached to a bolted modular extension frame constructed of 50,000 psi tensile steel "C" channel mounted directly behind it to provide adequate support strength.

Documentation shall be provided, upon request to show that the options selected have been engineered for fit-up and approval for this modular bumper extension. A chart shall be provided to indicate the option locations and shall include, but not be limited to the following options: air horns, sirens, speakers, storage compartment, winches, and lights.

3-13 Tow Hooks

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

3-14 Gravel Pan

A gravel pan, constructed of bright aluminum treadplate, shall be furnished between the bumper and cab face.

The gravel pan shall be properly supported from the underside to prevent flexing and vibration of the aluminum treadplate.

3-15 Fender Liners

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

SECTION 4 - TIRES

4-1 Front Tires

Front tires shall be Michelin 315/80R22.50 radials, 20 ply all-position XZA1 tread, rated for 18,180-pound maximum axle load and 75 mph maximum speed.

The tires shall be mounted on Alcoa 22.50" x 9.00" polished aluminum disc wheels with a ten (10)-stud 11.25" bolt circle.

4-2 Rear Tires

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

The tires shall be mounted on Alcoa 22.50" x 9.00" polished aluminum disc wheels with a ten (10)-stud 11.25" bolt circle.

4-3 Tire Balance

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

4-4 Hub Covers (Front)

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

4-5 Hub Covers (Rear)

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

4-6 Lug Nut Covers

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

4-7 Mud Flaps

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

4-8 Tire Chains

A set of Onspot Automatic Tire Chains shall be installed near the rear of the apparatus.

SECTION 5 – COOLING SYSTEM

5-1 Radiator

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

The radiator shall be mounted in such a manner as to prevent the development of leaks caused by twisting or straining when the apparatus operates over uneven ground. The radiator assembly shall be isolated from the chassis frame rails with rubber isolators.

The radiator shall include an integral deaeration/expansion tank. For visual coolant level inspection, the radiator shall have a built-in sight glass. A coolant overflow tank shall be provided and mounted in a suitable location.

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

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

5-2 Coolant Lines

Gates, or Goodyear, rubber hose shall be used for all engine coolant lines installed by the chassis manufacturer.

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

5-3 Auxiliary Fuel Cooling System

A supplementary fuel cooling system shall be provided to allow the use of water from the discharge side of the pump for cooling the chassis engine fuel. The heat exchanger shall be a cylindrical type and shall be a separate unit. The cooler shall operate any time the pump is discharging water and shall be plumbed to the master drain valve.

SECTION 6 – EXHAUST SYSTEM

6-1 Exhaust System

The exhaust system shall be stainless steel from the turbo to the inlet of the selective catalytic reduction (SCR) device. The exhaust system shall include a diesel particulate filter (DPF) and an SCR device to meet current EPA standards. An insulation wrap shall be provided on all exhaust pipe between the turbo and SCR to minimize the transfer of heat to the cab. The exhaust shall terminate horizontally ahead of the passenger side rear wheels. A tailpipe diffuser shall be provided to reduce the temperature of the exhaust at the exit. Heat deflector shields shall be provided to isolate chassis and body components from the heat of the tailpipe diffuser.

6-2 Diesel Exhaust Fluid Tank

A minimum of 4.5-gallon diesel exhaust fluid (DEF) tank shall be provided and mounted in the driver's side body forward of the rear axle. The tank shall be constructed of 16-gauge type 304-L stainless steel.

A .50" drain plug shall be provided in a low point of the tank for drainage.

A fill inlet shall be located on the driver's side of the body and be covered with a hinged, spring loaded, stainless steel door that is marked "Diesel Exhaust Fluid Only".

The tank shall meet the engine manufacturer’s requirement for 10 percent expansion space in the event of tank freezing.

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

SECTION 7 – FUEL TANK

Fuel Tank

A minimum of 65-gallon fuel tank shall be provided and mounted at the rear of the chassis. The tank shall be constructed of 12-gauge, hot rolled steel. It shall be equipped with swash partitions and a vent. To eliminate the effects of corrosion, the fuel tank shall be mounted with stainless steel straps.

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

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

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

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

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

SECTION 8 – BRAKES

8-1 System

The brake system shall include:

- Bendix-Westinghouse dual brake treadle valve with vinyl covered foot surface

- A heated automatic moisture ejector on air dryer

- A minimum total air system capacity of 4,362 cubic inch

- Two (2) air pressure gauges with red warning light and audible alarm, that activates when air pressure falls below 60 psi

- MGM spring set parking brake system

- Parking brake operated by a Bendix-Westinghouse PP-1 control valve

- A parking "brake on" indicator light on instrument panel

- Bendix-Westinghouse SR-1 valve, in conjunction with a double check valve system, shall be provided with an automatic spring-brake application at 40 psi

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

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

- Wabco System Saver 1200 air dryer with spin-on coalescing filter cartridge

- 100-Watt Heater

- One (1) Kussmaul Air Auto Ejector Model # 091-28 shall be installed with Kussmaul Weatherproof Adapter Kit Model # 091-28AK. It shall allow station air to be supplied to the apparatus brake system through a shoreline hose. A check valve shall be provided to prevent reverse flow of air. The inlet shall discharge into the “wet” tank of the brake system. A solenoid wired to the vehicle’s starter is energized when the engine is started. This instantaneously drives the connector from the receptacle. A mating Kussmaul connector Model #091-28-FC shall be supplied. The Kussmaul Air Auto Ejector shall be installed on the driver’s side exterior of the cab behind the crew cab door.

8-2 Brakes

The service brake system shall be full air type by Meritor™.

Front brakes shall be disc type with automatic pad wear adjustment and ventilated rotors.

The rear brakes shall be Meritor™ cam operated with automatic slack adjusters.

8-3 Brake System Air Compressor

The air compressor shall be a Cummins/Wabco with 18.7 cubic feet per minute output.

8-4 Brake Lines

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

8-5 Anti-Lock Brake System

The vehicle shall be equipped with a Wabco anti-lock braking system. The ABS shall provide a four (4) channel anti-lock braking control on both the front and rear wheels. A digitally controlled system that utilizes microprocessor technology shall control the anti-lock braking system. Each wheel shall be monitored by the system. When any particular wheel begins to lockup, a signal shall be sent to the control unit. This control unit then shall reduce the braking of that wheel for a fraction of a second and then reapply the brake. This anti-lock brake system shall eliminate the lockup of any wheel thus helping to prevent the apparatus from skidding out of control.

SECTION 9 - ENGINE

9-1 General

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

Make: Cummins
Power: Minimum of 400 hp at 2100 rpm
Torque: Minimum of 1250 lb.-ft at 1400 rpm
Governed Speed: 2200 rpm
Fuel: Diesel
Cylinders: Six (6)
Fuel Filters: Spin-on style primary filter with water separator & water-in-fuel sensor.
Coolant Filter: Spin-on style with shut off valves on the supply and return line.

9-2 High Idle

A high idle switch shall be provided, inside the cab, on the instrument panel, that shall automatically maintain a preset engine rpm. A switch shall be installed, at the cab instrument panel, for activation/deactivation.

The high idle shall be operational only when the parking brake is on and the truck transmission is in neutral. A green indicator light shall be provided, adjacent to the switch. The light shall illuminate when the above conditions are met. The light shall be labeled "OK to Engage High Idle."

9-3 Engine Brake

A Jacobs's engine brake is to be installed with the controls located on the instrument panel within easy reach of the driver.

The driver shall be able to turn the engine brake system on/off and have a high, medium and low setting.

The high setting of the brake application shall activate and work simultaneously with the variable geometry turbo (VGT) provided on the engine.

The engine brake shall be installed in such a manner that when the engine brake is slowing the vehicle the brake lights are activated.

The ABS system shall automatically disengage the auxiliary braking device, when required.

9-4 Clutch Fan

A Horton fan clutch shall be provided. The fan clutch shall be automatic when the pump transmission is in "Road" position, and constantly engaged when in "Pump" position.

9-5 Engine Air Intake

The air intake with ember separator shall be mounted on the passenger side of the apparatus, to the front of the engine. The ember separator is designed to prevent road dirt and recirculating hot air from entering the engine. The ember separator shall be easily accessible by tilting the cab.

SECTION 10 - TRANSMISSION

10-1 Transmission

An Allison electronic torque converting automatic transmission shall be provided.

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

Two (2) PTO openings shall be located on left side and top of converter housing (positions 9 o'clock and 3 o'clock).

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

10-2 Transmission Shifter

A five (5)-speed push button shift module shall be mounted to the right of driver on console. The shift module shall have a programmable “mode” button option installed below the “5” speed push button. Shift position indicator shall be indirectly lit for after dark operation.

10-3 Transmission Cooler

A transmission oil cooler shall be provided that is integral to the radiator and located at the bottom of the radiator. The cooler shall use engine coolant to control the transmission oil temperature.

SECTION 11– DRIVE SHAFT/STEERING

11-1 Driveline

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

The shafts shall be dynamically balanced before installation.

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

11-2 Steering

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

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

11-3 Steering Wheel

The steering wheel shall have tilting and telescoping capabilities.

SECTION 12 - CAB

12-1 General

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

Construction of the cab shall consist of 5052-H32 .125" aluminum welded to extruded aluminum framing.

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

The cab shall be approximately 96.00" wide, with an interior width of approximately 87.50".

The forward cab section shall have an overall height (from the cab roof to the ground) of approximately 99.00". The crew cab section shall preferably have a 12.00" raised roof.

Floor to ceiling height inside the crew cab shall be approximately 67.00" on the outside and 61.75" in the center.

The crew cab shall be of the totally enclosed design.

The cab shall be a full tilt design, allowing easy maintenance of the engine compartment. The engine shall be easily accessible and capable of being removed with the cab tilted.

Provisions for checking the transmission, oil, and power steering fluid levels shall be placed so that they are accessible without raising the cab.

The cab shall have three (3)-point rubber mounting and shall be tilted by a hydraulic pump connected to two (2) cab lift cylinders. The cab shall then be locked down by a two (2)-point automatic locking mechanism that actuates after the cab has been lowered.

The cab and crew cab shall be completely open to allow visual and audio communication with the passengers.

A clipboard/book holder shall be mounted in the cab. The holder shall be made of metal and have a minimum of three slats. Specific mounting location shall be determined by the customer.

12-2 Engine Tunnel

The engine hood shall be constructed of insulated aluminum.

The engine hood shall be insulated for protection from heat and sound. The noise insulation shall keep the DBA level within the limits stated in the current NFPA series 1900 pamphlet.

12-3 Windshield

A curved, safety glass windshield shall provide over 2,754 square inches of clear viewing area. The cab windshield shall have bright trim inserts in the rubber molding holding the glass in place.

All cab glass shall be tinted.

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

12-4 Windshield Wipers

The two (2) windshield wipers shall be electrically controlled and meet FMVSS requirements.

Each wiper shall be individually controlled and have a speed modulation feature allowing the driver to adjust the speed of the wiper. The windshield wipers shall also be furnished with a return to park feature, which allows the wiper to return to the stored position when the wiper is not in use.

Each wiper shall be equipped with a washer and wiper control.

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

12-5 Cab Rear Wall Exterior Covering

The exterior surface of the rear wall of the cab shall be overlaid with bright aluminum treadplate except for areas that are not typically visible when the cab is lowered.

12-6 Cab Lift

A hydraulic cab lift system shall be provided consisting of an electric powered hydraulic pump, dual lift cylinders, and necessary hoses and valves.

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

Lift controls shall be located on the front area of the body in a convenient location within an enclosed compartment.

The cab shall be locked down by a two (2)-point normally closed spring-loaded hook type latch that fully engages after the cab has been lowered. The system shall be hydraulically actuated to release the normally closed locks when the cab lift control is in the raised position and cab lift system is under pressure. When the cab is completely lowered and system pressure has been relieved, the spring-loaded latch mechanisms shall return to the normally closed and locked position.

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

12-7 Grille

A front cab grille shall be supplied. It shall consist of a polished stainless-steel grille screen with decorative bright anodized aluminum framework.

12-8 Mirrors

One (1) Ramco, polished aluminum mirror shall be mounted on each of the cab doors. The mirrors shall be 9.25" x 13.50", with a full flat face. An additional convex section shall be bolted to the top of each mirror. The mirror head shall have a highly polished aluminum finish.

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

The convex section in each mirror shall be adjusted manually.

12-9 Doors
The cab doors shall be approximately 35.00" wide x 68.00" high.

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

All cab and crew cab doors shall contain a conventional roll down window.

Crew cab entrance doors shall be located on the side of the cab behind the front wheels.

The crew cab doors shall be double pan type and measure approximately 35.00" wide x 80.00" high.

Flush mounted, chrome plated paddle type door handles shall be provided on the exterior of the cab and crew cab doors.

All interior cab and crew cab door handles shall also have flush paddle handles.

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

The door hinges shall be a stainless-steel piano type with a .25" pin.

There shall be double automotive type rubber seals around the perimeter of all cab and crew cab doors to ensure a weather tight fit.

12-10 Cab Steps
The forward cab and crew cab access steps shall be 22.00" wide with an 8.00" minimum depth. The steps shall be located inside the doors, protecting them from weather elements. A slip-resistant handrail shall be provided adjacent to each cab door opening to assist during cab ingress and egress.

12-11 Fender Crowns
Stainless steel fender crowns shall be installed at the cab wheel openings.

12-12 Cab Interior
The door panels shall be constructed of smooth aluminum and painted to match the cab interior.

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

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

12-13 Cab Interior Upholstery
The cab interior upholstery shall be dark silver gray.

12-14 Interior Paint (Cab)
The cab interior metal surfaces shall be painted gray, vinyl texture paint.

12-15 Cab Floor

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

The top surface of the material has a series of raised pyramid shapes evenly spaced, which offer a superior grip surface. Additionally, the material has a .25" thick closed cell foam (no water absorption) which offers a sound dampening material for reducing sound levels.

12-16 Interior Cab Insulation

The cab and crew cab walls shall be insulated with 1.50" insulation and the ceiling shall have 1.00" insulation to reduce heat transfer into the cab.

The insulation shall be covered with a vinyl liner or a metal panel painted to match the interior.

12-17 Grab Handle

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

The driver's grab handle shall be 3.00" higher than the officer's grab handle, to allow additional clearance between the steering wheel and grab handle.

12-18 Engine Hood Cover

The exterior surface of the engine hood shall have a 46.00-ounce padded vinyl cover. A flap shall be provided over the hinged access door leading to the fluid level dipsticks. The flap shall be secured with Velcro.

12-19 Helmet Holders

There shall be four (4) helmet holder bracket(s) provided in the cab. The brackets shall provide quick access and secure storage of the helmet(s). The bracket location(s) shall be determined at time of final inspection.

12-20 Power Supply Stations

There shall be two (2) power station hubs that will provide a range of power options for electronics. These outlets shall be energized regardless if the vehicle is running or not. Each hub shall contain a one (1) 110V outlet, one (1) cigarette charger, and two (2) USB ports (power rating to be decided). One station shall be installed in the front cab near the officer and the other shall be installed in the rear of the cab. Confirm mounting locations with customer.

Section 13 – SEATING

13-1 Seating Capacity
The seating capacity in the cab shall be four.

13-2 Driver's Seat
A Seats Inc. #911 scissor-action air-ride, mid-height with headrest style seat shall be provided in the cab for the driver.

The driver's seat shall be furnished with three (3) point shoulder type seat belt. The seat belt shall be furnished with automatic retractor. Extension shall be provided with the seat belt so the male end can be easily grasped and the female end easily located while sitting in a normal position.

13-3 Officer's Seat
A Seats Incorporated 911 SCBA seat with high-back shall be provided in the cab for the officer. The SCBA cavity shall be adjustable front to rear in 0.50" increments to accommodate different size SCBA bottles.

Moving the SCBA cavity shall be accomplished by unbolting, relocating and re-bolting in the desired location.

The officer seat shall be furnished with three (3)-point shoulder type seat belts. The seat belts shall be furnished with automatic retractors. Extensions shall 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.

13-4 Forward Facing Rear Positions
There shall be two (2) forward facing, Seats Incorporated 911 SCBA seats provided at the center position in the crew cab. The SCBA cavity shall be adjustable front to rear in .50" increments to accommodate different size SCBA bottles.

Moving the SCBA cavity shall be accomplished by unbolting, relocating and re-bolting in the desired location.

The seats shall be furnished with a three (3)-point, shoulder type seat belt. The seat belts shall be furnished with automatic retractors. Extensions shall 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.

13-5 Seat Upholstery
All Seats Inc. 911 seat upholstery shall be gray woven with black Imperial 1200 material.

13-6 SCBA Air Bottle Holders
All SCBA type seats in the cab shall have an IMMI SmartDock handsfree SCBA holding system. This bracket shall be compliant with the current NFPA 1901 standards. The bracket seats shall be a "one size fits all" style seat and shall accommodate SCBA cylinders from the high pressure 30-minute to the high pressure 60-minute.

13-7 Seat Belts
All seating positions in the cab and crew cab shall have red seat belts.

SECTION 14 – CAB LIGHTING

14-1 Cab Interior Lighting

Auxiliary lights shall be provided in the cab and consisting of:

- One (1) Clear Dome Light: Located in the center, controlled by automatic door switches.

- Two (2) ½ Red/ ½ Clear Dome Lights: Red lights controlled by pushing lens. Clear lights controlled by automatic door and by pushing lens. One each over Driver and Officer.

- Two (2) Adjustable Map Lights: With switches mounted on the cab ceiling.

-One (1) Red Warning Light – Automatically flashes when transmission is placed into "drive" and truck cab and/or compartment doors are open.

- An LED Courtesy Light at Each Door Opening: Controlled by automatic door switches.

14-2 Crew Cab Location

There shall be two (2) Weldon, LED dome lights with bezels installed in the crew cab located one (1) each side, controlled by the following:

The forward, clear light shall be controlled by the door switch and the lens switch.

The rear, red light shall be controlled by the lens switch only.

A courtesy located light at each door opening controlled by automatic door switches.

14-3 Handheld Spotlight

There shall be one (1) Collins LED spotlight with a 9-foot coil cord and momentary switch. The housing shall be made from aircraft aluminum that is black powder coated. Location of the spotlight shall be on the officer's side cab dash panel.

14-4 Engine Compartment Light

An engine compartment light shall be installed under the engine hood, of which the switch is an integral part.

SECTION 15 - CLIMATE CONTROL

15-1 Cab Heater/Defroster

Appropriately sized fresh air heater/defroster units shall be provided inside the cab. A three (3)-speed blower and temperature control shall be provided with the heating units. Blower control shall allow for independent control of defrost and heat for driver and passenger.

15-2 Crew Cab Heaters

Appropriately sized auxiliary heater(s) shall be provided in the crew cab. The heaters shall have a three (3)-speed blower and temperature controls.

15-3 Air Conditioning

A high performance, customized air conditioning system shall be furnished inside the cab and crew cab.

The air conditioning system shall be capable of cooling the average cab temperature from 100 degrees Fahrenheit to 75 degrees Fahrenheit within 30 minutes at 50 percent relative humidity. The cooling performance test shall be run only after the cab has been heat soaked at 100 degrees Fahrenheit for a minimum of four (4) hours.

A roof mounted condenser with a BTU rating sufficient to meet and exceed the performance specification shall be installed on the cab roof. Mounting the condenser below the cab or body shall be unacceptable.

The air conditioning system shall be capable of cooling the average cab temperature from 100-degree Fahrenheit to 75-degree Fahrenheit within 30 minutes at 50% relative humidity. The cooling performance test shall be run only after the cab has been heat soaked at 100-degree Fahrenheit for a minimum of four hours.

Two (2) evaporator units shall be installed, one (1) in the cab and one (1) in the crew cab. The crew cab evaporator shall be mounted centered above the engine tunnel. The evaporator units shall have an adequate BTU rating to meet the performance specifications.

Adjustable air outlets shall be strategically located per the following:

Two (2) shall be directed towards the driver’s location

Two (2) shall be directed towards the officer’s location

Four (4) shall be directed towards the crew cab area

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

All refrigerant lines and hose connections shall be mechanically crimped to ensure a long-lasting sealed system is achieved.

SECTION 16 - COMMUNICATION EQUIPMENT

16-1 Compartment

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

The inside compartment dimensions shall be 17.63" deep x 15.75" across x 5.25" high.

A drop-down door with a chrome plated lift and turn latch shall be provided for access.

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

16-2 Radio Antenna Mount

There shall be three (3) standard antenna-mounting bases, with 25 feet of coax cable and weatherproof cap provided for a two (2)-way radio installation. The standard mount shall be located on the cab roof, just to the rear of the officer’s seat and the additional mounts shall be located on the lower cab roof. The cables shall be routed to the dash instrument panel.

SECTION 17 - CAB INSTRUMENTATION

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

17-1 Gauges

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

Voltmeter gauge (volts):

Low volts (11.8 VDC)

Amber telltale light on indicator light display with steady tone alarm

High volts (15.5 VDC)

Amber telltale light on indicator light display with steady tone alarm

Engine Tachometer (RPM)

Speedometer MPH

Fuel level gauge (Empty - Full)

Low fuel (1/8 full)

Amber telltale light on indicator light display with steady tone alarm

Engine Oil pressure Gauge (PSI):

Low oil pressure to activate engine warning lights and alarms

Red telltale light on indicator light display with steady tone alarm

Front Air Pressure Gauges (PSI):

Low air pressure to activate warning lights and alarm

Red telltale light on indicator light display with steady tone alarm

Rear Air Pressure Gauges (PSI):

Low air pressure to activate warning lights and alarm

Red telltale light on indicator light display with steady tone alarm

Transmission Oil Temperature Gauge (Fahrenheit):

High transmission oil temperature activates warning lights and alarm

Amber telltale light on indicator light display with steady tone alarm

Engine Coolant Temperature Gauge (Fahrenheit):

High engine temperature activates an engine warning light and alarms

Red telltale light on indicator light display with steady tone alarm

Diesel Exhaust Fluid Level Gauge (Empty - Full)

Low fluid (1/8 full)

Amber telltale light on indicator light display

17-2 Indicator Lamps

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

The following amber telltale lamps shall be present:

Low coolant

Check engine

Check Trans (check transmission)

Air rest (air restriction)

Driver's door open

Passenger's door open

DPF (engine diesel particulate filter regeneration)

HET (engine high exhaust temperature) (where applicable)

ABS (antilock brake system)

MIL (engine emissions system malfunction indicator lamp) (where applicable)

Regeneration inhibit (where applicable)

Transmission temperature (transmission temperature)

Auxiliary brake overheat (where applicable)

DEF (low diesel exhaust fluid level)

The following red telltale lamps shall be present:

Parking brake

Stop engine

The following green telltale lamps shall be present:

Left turn

Right turn

Battery on

Ignition

Aux brake (auxiliary brake engaged) (where applicable)

The following blue telltale lamps shall be present:

High beam

17-3 Alarms
Audible steady tone warning alarm: A steady audible tone alarm shall be provided whenever a warning message is present.

17-4 Back-up Alarm
A PRECO, solid-state electronic audible back-up alarm that actuates when the truck is shifted into reverse shall be provided. The device shall sound at 60 pulses per minute and automatically adjust its volume to maintain a minimum ten (10) DBA above surrounding environmental noise levels.

17-5 Indicator Lamp and Alarm Prove-Out
A system shall be provided which automatically tests telltale indicator lights and alarms located on the cab instrument panel. Telltale indicators and alarms shall perform prove-out when the ignition switch is held in the up position for three (3) to five (5) seconds to ensure proper performance.

17-6 Control Switches
For ease of use, the following controls shall be provided immediately adjacent to the cab instrument panel within easy reach of the driver. All switches shall have backlit labels for low light applications.

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

Panel backlighting intensity control switch: A variable voltage control switch shall be provided. The switch turned counter clockwise increases the panel backlighting intensity to a maximum level and the switch turned clockwise decreases the panel backlighting intensity to a minimum level.

Ignition switch: A three (3)-position maintained/momentary rocker switch shall be provided. The first switch position shall deactivate vehicle ignition. The second switch position shall activate vehicle ignition. The third momentary position shall perform prove-out on the telltale indicators and alarms when the ignition switch is held in the up position for three (3) to five (5) seconds to ensure proper performance. A green indicator lamp is activated with vehicle ignition.

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

Hazard switch shall be incorporated into the steering column.

Heater and defroster controls.

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

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

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

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

17-7 Custom Switch Panels
The design of cab instrumentation shall allow for emergency lighting and other switches to be placed within easy reach of the operator thus improving safety. There shall be positions for up to five (5) switch panels in the engine tunnel console. All switches have backlit labels for low light applications.

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

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

Diesel particulate filter regeneration switch (where applicable).

Diesel particulate filter regeneration inhibit switch (where applicable).

17-8 Diagnostic Panel
A diagnostic panel shall be accessible while standing on the ground and shall be located inside the driver's side door right of the steering column. The diagnostic panel shall allow diagnostic tools such as computers to connect to various vehicle systems for improved troubleshooting providing a lower cost of ownership. Diagnostic switches shall allow engine and ABS systems to provide blink codes should a problem exist. The diagnostic panel shall include the following:

Engine diagnostic port

Transmission diagnostic port

ABS diagnostic port

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

An ABS diagnostic switch shall be accessible while standing on the ground and located inside the passenger's cab side door. The diagnostic switch shall allow ABS system blink codes should a problem exist. The diagnostic panel shall include the following:

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

17-9 Air Restriction Indicator
A high air restriction warning indicator light (electronic) shall be provided.

17-10 “Do Not Move Apparatus” Indicator
A flashing red indicator light, located in the driving compartment, shall be illuminated automatically per the current NFPA requirements. The light shall be labeled "Do Not Move Apparatus If Light Is On."

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

17-11 Open Door Indicator
Two (2) amber indicator lights shall be provided and located in clear view of the driver, warning of an open passenger or equipment compartment door.

One (1) light shall indicate the status of doors on the driver's side and rear of the vehicle and the other light shall indicate the status of the doors on the passenger side.

17-12 Wiper Control
One wiper control switch that operates both wipers is preferable. The switch shall be two (2)-speeds and control the washer fluid.

17-13 Spare Circuit
There shall be two (2) pair of wires, including a positive and a negative, installed on the apparatus.

The above wires shall have the following features:

The positive wire shall be connected directly to the battery power.

The negative wire shall be connected to ground.

Wires shall be protected to 15 amps at 12 volts DC.

Power and ground shall terminate at the officer's side on the cab dash.

Termination shall be with a 15-amp power point plug with a rubber cover.

Wires shall be sized to 125% of the protection.

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

17-14 Seat Belt Monitoring System
A seat belt monitoring system (SBMS) shall be provided. The SBMS shall be capable of monitoring up to ten (10) seat positions indicating the status of each seat position with a green or red LED indicator as follows:

Driver's Seat:

Seat Occupied Buckled Green

No Occupant Unbuckled Not Illuminated

The driver seat shall not include an occupant sensor. The display indication for the driver seat shall illuminate red any time the parking brake is released and the driver seat belt is not buckled.

All Other Seats:

Seat Occupied Buckled Green

Seat Occupied Unbuckled Red

No Occupant Buckled Red

No Occupant Unbuckled Not Illuminated

Alarm:

The SBMS shall include an audible alarm that shall be activated when a red illumination condition exists and the parking brake is released, or a red illumination condition exists and the transmission is not in park.

17-15 Tire Chains Wiring
A locking style switch shall be installed on the instrument panel for activation of tire chains.

SECTION 18-VEHICLE DATA RECORDER

A vehicle data recorder (VDR) shall be provided. The VDR shall be capable of reading and storing vehicle information. The VDR shall be capable of operating in a voltage range from 8VDC to 16VDC. The VDR shall not interfere with, suspend, or delay any communications that may exist on the CAN data link during the power up, initialization, runtime, or power down sequence. The VDR shall continue operation upon termination of power or at voltages below 8VDC for a minimum of 10ms.

The information stored on the VDR can be downloaded through a USB port mounted in a convenient location determined by cab model. A CD provided with the apparatus shall include the programming to download the information from the VDR. A USB cable can be used to connect the VDR to a laptop to retrieve required information.

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

Vehicle Speed - MPH

Acceleration - MPH/sec

Deceleration - MPH/sec

Engine Speed - RPM

Engine Throttle Position - % of Full Throttle

ABS Event - On/Off

Seat Occupied Status - Yes/No by Position (7-12 Seating Capacity)

Seat Belt Buckled Status - Yes/No by Position (7-12 Seating Capacity)

Master Optical Warning Device Switch - On/Off

Time - 24 Hour Time

Date - Year/Month/Day

SECTION 19 – ELECTRICAL SYSTEM

19-1 Electrical Power Control System

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

Serviceable components shall be readily accessible.

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

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

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

19-2 Voltage Monitor System

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

19-3 Power and Ground Stud

A 12-volt power stud and a grounding stud shall be provided in the electrical component compartment for two-way radio equipment.

19-4 EMI/RFI Protection

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

The apparatus proposed shall have the ability to operate in the electromagnetic environment typically found in fire ground operations. The contractor shall be able to demonstrate the EMI and RFI testing has been done on similar apparatus and certifies that the vehicle proposed meets SAE J551 requirements.

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

19-5 General Electrical

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

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

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

(2) Any electrical component that is installed in an exposed area shall be mounted in a manner that shall not allow moisture to accumulate in it. Exposed area shall be defined as any location outside of the cab or body.

(3) Electrical components designed to be removed for maintenance shall not be fastened with nuts and bolts. Metal screws shall be used in mounting these devices. A coil of wire shall be provided behind the appliance to allow them to be pulled away from mounting area for inspection and service work.

(4) Corrosion preventative compound shall be applied to all terminal plugs located outside of the cab or body. All non-waterproof connections shall require this compound in the plug to prevent corrosion and for easy separation (of the plug).

(5) All lights that have their sockets in a weather exposed area shall have corrosion preventative compound added to the socket terminal area.

(6) All electrical terminals in exposed areas shall have silicon (1890) applied completely over the metal portion of the terminal. All emergency light switches shall be mounted on a separate panel installed in the cab. A master warning light switch and individual switches shall be provided to allow pre-selection of emergency lights. The light switches shall be "rocker" type with an internal indicator light to show when switch is energized. All switches shall be properly identified and mounted in a removable panel for ease in servicing. Identification of the switches shall be done by either printing or etching on the switch panel. The switches and identification shall be illuminated.

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

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

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

19-6 Battery System
Six 12 volt, Exide batteries that include the following features shall be provided:

- Minimum of 950 CCA, cold cranking amps

- Minimum of 190-amp reserve capacity

- High cycle

- Group 31

- Minimum of 760 minutes of reserve capacity

- Threaded stainless steel studs

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

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

19-7 Ignition Starting System
A single starting system shall be provided.

An ignition switch and starter button shall be located on the instrument panel.

19-8 Master Battery Switch
A master battery switch, to activate the battery system, shall be provided inside the cab within easy reach of the driver.

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

19-9 Battery Compartments
Batteries shall be placed on non-corrosive mats and be stored in well ventilated compartments located under the cab.

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

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

19-10 Jumper Studs
One (1) set of battery jumper studs with plastic color-coded covers shall be included on the battery compartments.

19-11 Battery Charger
A Kussmaul Auto charge battery charger with internal battery saver shall be installed. A bar graph display indicating the state of charge shall be included.

The battery saver circuit shall be capable of supplying up to three (3) amps for external loads such as hand light or auxiliary radio batteries.

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

Battery charger shall be located in the front left body compartment, mounted on the cab roof.

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

19-12 Kussmaul Auto Eject Shoreline
One (1) shoreline receptacle shall be provided to operate the dedicated 120-volt circuits on the truck.

The shoreline receptacle shall be installed with a NEMA 5-15, 120-volt, 15-amp, straight blade Kussmaul Super auto eject plug with a yellow weatherproof cover. The cover is spring loaded to close, preventing water from entering when the shoreline is not connected.

The unit is completely sealed to prevent road dirt contamination.

A solenoid wired to the vehicle's starter is energized when the engine is started. This instantaneously drives the plug from the receptacle.

An internal switch arrangement shall be provided to disconnect the load prior to ejection to eliminate arcing of the connector contacts.

The shoreline shall be connected to the battery charger.

A mating connector body shall also be supplied with the loose equipment.

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

19-13 Alternator
An appropriately sized Leece-Neville alternator shall be provided. The alternator shall feature an integral, self-diagnostic regulator and rectifier. The alternator shall be connected to the power and ground distribution system with heavy-duty cables sized to carry the full rated alternator output.

19-14 Electronic Load Management
A Kussmaul Load Manager shall be provided on the apparatus. The device is an electronic load management (ELM) system that monitors the vehicles 12-volt electrical system, and automatically reduces the electrical load in the event of a low voltage condition and by doing so, ensures the integrity of the electrical system.

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

SECTION 20 - EXTERIOR LIGHTING

Exterior lighting shall meet or exceed Federal Department of Transportation, Federal Motor Vehicle Safety Standards and National Fire Protection Association requirements.

Front headlights shall be LED's, rectangular shaped, quad style mounted in a chrome and polished aluminum housing.

Seven (7) LED clearance and marker lights shall be installed across the leading edge of the cab.

20-1 Rear ID/Marker DOT Lighting

There shall be one (1) Truck-Lite three (3) LED light kit used as identification lights located at the rear of the apparatus per the following:

- As close as practical to the vertical Centerline.
- Centers spaced not less than six (6) inches or more than twelve (12) inches apart.
- Red in color.
- All at the same height.

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

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

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

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

20-2 Directional (Front)

Front turn signals shall be Whelen, populated sequencing LED arrow shape amber lamps housed in chrome bezels. The turn signals shall be housed in the same common bezel as the front warning light and be located above the headlights.

In addition to the front facing directional, a Weldon, marker/turn indicator shall be provided on each side of the cab.

20-3 Rear FMVSS Lighting
The rear stop/tail and directional lighting shall consist of the following:

Two (2) Whelen red LED combination stop/tail lights.

Two (2) Whelen, amber LED populated arrow turn signal lights.

These lights shall be installed at the rear of the truck in a polished housing.

Four (4) red reflectors shall be provided.

A Weldon, license plate bracket shall be mounted on the driver's side above the warning lights. A Weldon, LED step lamp shall illuminate the license plate.

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

20-4 Lighting Bezel
Two (2) Whelen, four (4) light aluminum housings shall be provided for mounting four (4) Whelen LED lights.

20-5 Lights (Intermediate)
There shall be one (1) pair, of Truck-Lite, amber, LED, turn signal, marker lights furnished, one (1) each side, horizontally in the rear fender panel.

A stainless-steel trim shall be included with this installation.

20-6 Perimeter Scene Lights (Cab)
There shall be a Truck-Lite, grommet mount weatherproof LED light provided for each cab door. Lighting shall be designed to provide illumination on areas under the driver, officer, and crew cab riding area exits, which shall be activated automatically when the exit doors are opened and by the same means as the body perimeter lights.

The lighting shall be capable of providing illumination at a minimum level of two (2) foot-candles on ground areas within 30.00" of the edge of the apparatus in areas which personnel climb in or out of the apparatus or descend from the apparatus to the ground level.

20-7 Perimeter Scene Lights, (Body)
There shall be a total of four (4) Truck-Lite, grommet mount, LED weatherproof lights provided on the apparatus. Two (2) lights shall be provided under the rear step area and two (2) lights shall be provided under the pump panel running boards. The lights shall be spaced one (1) each side of apparatus and have a clear lens. The perimeter scene lights shall be activated by a switch in the cab.

The lighting shall be capable of providing illumination at a minimum level of two (2) foot-candles on ground areas within 30.00" of the edge of the apparatus in areas designed for personnel to climb onto the apparatus or descend from the apparatus to the ground level.

20-8 Step Lights
Four (4) white Truck-Lite LED, step lights shall be provided. One (1) step light shall be provided on each side, on the front compartment face and two (2) step lights at the rear to illuminate the tailboard.

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

minimum of 1.5 fc covering an entire 30" x 30" square at the same ten (10) inch distance below the light.

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

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

20-9 12 Volt Lighting

There shall be two (2) Havis 12-volt DC, lights, with pull up poles installed, one (1) located each side adjacent to the side pump panels. These lights shall be installed to minimize the intrusion of the open space in the basket. The light heads shall be Whelen, LED combination flood and spotlights.

A control for the lights selected above shall be the following:

A switch located at the pump operator's panel.

The lights shall be connected to the "Do Not Move Truck" indicator.

The lights may be load managed when the parking brake is set.

There shall be one (1) Whelen 12-volt LED combination spot and floodlight provided on the front visor, centered.

The light shall be controlled by the following:

A switch located at the driver's side cab switch panel

A switch located at the passenger's side cab switch panel

This light may be load managed when the parking brake is set.

20-10 Deck Lights

Two (2)-6.00" Whelen LED deck lights with swivel mount shall be provided at the rear of the hose bed, one (1) each side.

One (1) light shall be furnished with a minimum 160,000 candle power LED spot bulb and the other shall be furnished with a minimum 6,000 candle power LED flood bulb.

20-11 Booster Tank Fill Level Lights Mounted to Cab

Two (2) Whelen Strip-Lite Plus XL Tank Lights PSXLFC shall be mounted on each side of the rear cab.

SECTION 21 - WATER TANK

Booster tank shall have a capacity of 750 gallons and be constructed of polypropylene plastic by United Plastic Fabricating, Incorporated. The tank shape configuration shall be designed to accommodate the ladder storage tunnel and to minimize the overall height of the hose bed.

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

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

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

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

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

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

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

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

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

A sump that is 8.00" long x 8.00" wide x 6.00" deep shall be provided at the bottom of the water tank.

Sump shall include a drain plug and the tank outlet.

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

Sufficient crossmembers shall be provided to properly support bottom of tank. Crossmembers shall be constructed of steel bar channel or rectangular tubing.

Tank shall "float" in cradle to avoid tortional stress caused by chassis frame flexing. Rubber cushions, .50" thick x 3.00" wide, shall be placed on all horizontal surfaces that the tank rests on.

Stops or other provision shall be provided to prevent an empty tank from bouncing excessively while moving vehicle.

Mounting system shall be approved by the tank manufacturer.

Fill tower shall be constructed of .50" polypropylene and shall be a minimum of 8.00" wide x 14.00" long.

Fill tower shall be furnished with a .25" thick polypropylene screen and a hinged cover.

An overflow pipe, constructed of 4.00" schedule 40 polypropylene, shall be installed approximately halfway down the fill tower and extend through the water tank and exit to the rear of the rear axle.

SECTION 22 - HOSE BED

22-1 General

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

Upper and rear edges of side panels shall have a double break for rigidity, a split tube finish shall not be acceptable.

The upper inside area of the beavertails shall be covered with brushed stainless steel to prevent damage to painted surface when hose is removed.

Flooring of the hose bed shall be removable aluminum grating with the top surface corrugated to aid in hose aeration. The grating slats shall be a minimum of .50" x 4.50" with spacing between slats for hose ventilation.

Hose bed shall accommodate 1000 feet of 5" and 1000 feet of 3" hose.

Adjustable hose bed dividers shall be installed for separating hose in the above sentence.

Each divider shall be constructed of minimum .25" brushed aluminum sheet.

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

Dividers shall be held in place by tightening two (2) bolts, one (1) at each end.

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

Flat surfaces shall be sanded for uniform appearance, or constructed of brushed aluminum.

Attempts will be made to keep the overall height of the hose bed as low to the ground as possible.

SECTION 23 – TRUCK BED

23-1 Running Boards
Running boards shall be fabricated of minimum .125" bright aluminum treadplate.

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

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

A splashguard shall be provided above the running board treadplate.

23-2 Tailboard
The tailboard shall also be constructed of minimum .125" bright aluminum treadplate and spaced .50" from the body, as well as supported by a structural steel assembly.

The tailboard area shall be approximately 16.00" deep.

The exterior side shall be flanged down and in for increased rigidity of tailboard structure.

23-3 Rear Wall, Smooth Aluminum Body Material
The rear facing surfaces of the center rear wall shall be smooth aluminum.

The rear facing surfaces of the bulkheads, the surface to the rear of the side body compartments, shall be smooth and the same material as the body.

Any inboard facing surfaces below the height of the hose bed shall be bright aluminum treadplate.

23-4 Tow Bar
A tow bar shall be installed under the tailboard at center of truck.

Tow bar shall be fabricated of 1.00" CRS bar rolled into a 3.00" radius.

Tow bar assembly shall be constructed of .38" structural angle. When force is applied to the bar, it shall be transmitted to the frame rail.

Tow bar assembly shall be designed and positioned to allow up to a 30-degree upward angled pull of 17,000 lb. or a 20,000 lb. straight horizontal pull in line with the centerline of the vehicle.

Tow bar design shall have been fully tested and evaluated using strain gauge testing and finite element analysis techniques.

23-5 Aggressive Walking Surface
All exterior surfaces designated as stepping, standing, and walking areas shall comply with the required average slip resistance of the current NFPA standards.

23-6 Body Fender Crowns
Stainless steel fender crowns shall be provided around the rear wheel openings.

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

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

23-7 Handrails
The handrails shall be 1.25" diameter anodized aluminum extrusion, with a ribbed design, to provide a positive gripping surface.

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

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

- Four (4) handrails shall be provided, two (2) above each side pump panel.

- Two (2) vertical handrails shall be provided, one (1) each side of body, on the front bulkhead door frame.

- One (1) vertical handrail, not less than 29.00" long, shall be located on each rear beavertail.

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

23-8 Air Bottle Storage (Triple)
A total of two (2) air bottle compartments shall be provided located one (1) each side in front of the rear wheels. The compartments shall be designed to hold three (3) air bottles up to 7.25" diameter x 26.00" deep. Flooring shall be lined and be furnished with a drain hole. A stainless-steel door with a chrome plated latch shall be provided to contain the air bottle. A dielectric barrier shall be provided between the door hinge, hinge fasteners and the body sheet metal.

23-9 Air Bottle Compartment Strap
A strap shall be provided in the air bottle compartments to contain the air bottles when the vehicle is parked on an incline. The strap shall wrap around the neck and attach to the wall of the compartment.

23-10 Steps
A folding step shall be provided on the front of each fender compartment.

Four (4) additional folding steps shall be provided two (2) located each side on the front bulkheads.

Folding steps and corner steps shall be provided at the rear. All steps shall provide adequate surface for stepping and will be constructed of chrome plated stainless steel.

23-11 Bucket

It is the desire to have this open area with approximate dimensions of 29”X72” available for the storage of equipment. The construction/installation of the master stream deck gun, and pole lights shall be positioned to limit the impact on available free space in the bucket area. It is preferable that no other objects extend into the basket area.

SECTION 24 – COMPARTMENTATION

24-1 General

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

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

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

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

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

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

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

Side compartment covers shall be separate from the compartment tops.

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

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

24-2 Louvers

Louvers shall be stamped into compartment walls to provide the proper airflow inside the body compartments and to prevent water from dripping into the compartment. Where these louvers are provided, they shall be formed into the metal and not added to the compartment as a separate plate.

24-3 Compartments, Driver's Side

- Driver's Side 1 – A compartment with a pan door shall be located immediately behind the rear passenger door. The MINIMUM interior dimensions of this compartment shall be 30" x 20" x 24".
- Driver's Side 2 - A full height, roll-up door compartment ahead of the rear wheels shall be provided. The interior dimensions of this compartment shall be 44.00" wide x 58.25" high x 25.88" deep in the lower 26.00" of the compartment and 12.00" deep in the remaining upper portion. The height of the compartment shall be measured from the compartment floor to the bottom edge of the door roll. The depth of the compartment shall be calculated with the compartment door closed. The compartment interior shall be fully open from the compartment ceiling to the compartment floor and designed so that no permanent dividers are required between the upper and lower sections. The clear door opening of this compartment shall be 38.25" wide x 58.25" high.

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

- Driver's Side 3 - A roll-up door compartment over the rear wheels shall be provided. The interior dimensions of this compartment shall be 66.50" wide x 25.38" high x 12.00"

deep. The height of the compartment shall be measured from the compartment floor to the bottom edge of the door roll. The depth of the compartment shall be calculated with the compartment door closed. The clear door opening of this compartment shall be 58.25" wide x 25.12" high.

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

- Driver's Side 4 - A full height, roll-up door compartment behind the rear wheels shall be provided. The interior dimensions of this compartment shall be 47.50" wide x 58.25" high x 12.00" deep. A section of this compartment shall be 25.88" deep x 47.50" wide x 26.00" high directly behind the rear wheels. The height of the compartment shall be measured from the compartment floor to the bottom edge of the door roll. The depth of the compartment shall be calculated with the compartment door closed. The compartment interior shall be fully open from the compartment ceiling to the compartment floor and designed so that no permanent dividers are required between the upper and lower sections. The clear door opening of this compartment shall be 44.75" wide x 58.25" high.

  There shall be one (1) slide-out tray with 2.00" sides and a capacity of 500 pounds provided. Capacity rating shall be in the extended position. Slides shall be General Device ball bearing type for ease of operation and years of dependable service. Automatic locks shall be provided for both the "in" and "out" positions. The trip mechanism for it shall be located at the front of the tray for ease of use with a gloved hand. Heavy-duty steel angle iron assembly shall support the body under the compartment floor. It shall be attached to the chassis frame for load transfer and to reduce stress on body.

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

24-4 Compartments, Passenger Side

- Passenger's Side 1 – A compartment with a pan door shall be located immediately behind the rear passenger door. The MINIMUM interior dimensions of this compartment shall be 30" x 20" x 24".
- Passenger's Side 2 - A full height, roll-up door compartment ahead of the rear wheels shall be provided. The interior dimensions of this compartment shall be 44.00" wide x 58.25" high x 25.88" deep in the lower 26.00" of the compartment and 12.00" deep in the remaining upper portion. The height of the compartment shall be measured from the compartment floor to the bottom edge of the door roll. The depth of the compartment shall be calculated with the compartment door closed. The compartment interior shall be fully open from the compartment ceiling to the compartment floor and designed so that no permanent dividers are required between the upper and lower sections. The clear door opening of this compartment shall be 38.25" wide x 58.25" high.

  A PacTrac tool storage board that will hold mounted equipment shall be installed on the upper section of this compartment. The tool storage board and mounting hardware shall be constructed of materials that shall provide for a long service life.

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

- Passenger's Side 3 - A roll-up door compartment over the rear wheels shall be provided. The interior dimensions of this compartment shall be 66.50" wide x 25.38" high x 12.00" deep. The height of the compartment shall be measured from the compartment floor to the bottom edge of the door roll. The depth of the compartment shall be calculated with the compartment door closed. The clear door opening of this compartment shall be 58.25" wide x 25.12" high. Closing of the door shall not require releasing, unlocking, or unlatching any mechanism and shall easily be accomplished with one hand.

- Passenger's Side 4 - A full height, roll-up door compartment behind the rear wheels shall be provided. The interior dimensions of this compartment shall be 47.50" wide x 58.25" high x 12.00" deep. A section of this compartment shall be 25.88" deep x 47.50" wide x 26.00" high directly behind the rear wheels. The height of the compartment shall be measured from the compartment floor to the bottom edge of the door roll. The depth of the compartment shall be calculated with the compartment door closed. The compartment interior shall be fully open from the compartment ceiling to the compartment floor and designed so that no permanent dividers are required between the upper and lower sections. The clear door opening of this compartment shall be 44.75" wide x 58.25" high.

  There shall be one (1) slide-out tray with 2.00" sides and a capacity of 500 pounds provided. Capacity rating shall be in the extended position. Slides shall be General Device ball bearing type for ease of operation and years of dependable service. Automatic locks shall be provided for both the "in" and "out" positions. The trip mechanism for it shall be located at the front of the tray for ease of use with a gloved hand. Heavy-duty steel angle iron assembly shall support the body under the compartment floor. It shall be attached to the chassis frame for load transfer and to reduce stress on body. Channels shall be installed to allow for the storage of hydraulic extrication equipment. Exact location of these channels will be determined at a later date.

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

24-5 Roll-up Door, Side Compartments

The doors shall be double faced aluminum construction painted one (1) color to match the lower portion of the body manufactured by A&A Manufacturing (Gortite).

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

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

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

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

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

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

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

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

24-6 Compartment, Rear
A roll-up door compartment above the rear tailboard shall be provided.

Interior dimensions of this compartment shall be 40.00" wide x 40.63" high x 25.88" deep in the lower 32.38" of height and 15.75" deep in the remaining upper portion. Depth of the compartment shall be calculated with the compartment door closed.

Clear door opening of this compartment shall be 33.25" wide x 32.38" high.

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

The door shall be double faced aluminum construction anodized satin finish manufactured by A&A Manufacturing (Gortite).

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

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

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

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

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

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

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

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

There shall be one (1) slide-out tray with 2.00" sides and a capacity of 500 pounds provided. Capacity rating shall be in the extended position. Slides shall be General Device ball bearing type for ease of operation and years of dependable service. Automatic locks shall be provided for both the "in" and "out" positions. The trip mechanism for it shall be located at the front of the tray for ease of use with a gloved hand. Heavy-duty steel angle iron assembly shall support the body under the compartment floor. It shall be attached to the chassis frame for load transfer and to reduce stress on body.

24-7 Compartment Lighting
There shall be seven (7) compartments with LED compartment light strips. The strips shall be centered vertically along each side of the door framing. The compartments with these strip lights shall be each equipment compartment.

Any remaining compartments shall include 6.00" diameter Truck-Lite, LED light in each enclosed compartment.

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

24-8 Mounting Tracks
There shall be four (4) sets of tracks for mounting shelves one (1) set in each shelf equipped compartment (none in rear). These tracks shall be installed vertically to support the adjustable shelves and shall be full height of the compartment. The tracks shall be unpainted with a natural finish.

24-9 Adjustable Shelves
There shall be four (5) shelves with a capacity of minimum 215 pounds provided. The shelf construction shall consist of minimum .188" aluminum with 2.00" sides. Each shelf shall be painted to match the compartment interior. Each shelf shall be infinitely adjustable by means of a threaded fastener, which slides in a track.

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

The locations shall be per the directions of the fire chief.

24-10 Compartment Floor Scuff Plate
Aluminum treadplate shall be provided on the floor of one (1) compartment. The location shall be (R1) the rear step compartment.

The edges of the treadplate shall be completely caulked before installation to prevent corrosion.

24-11 Rub Rail
Bottom edge of the side compartments shall be trimmed with a bright aluminum extruded rub rail.

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

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

24-12 Backboard/Hose Pack Tunnel

A rectangular shaped tunnel made of diamond plate shall be provided to store a backboard and a 100’ 1 ¾” single-stack hose pack. The dimensions shall be a minimum of 73” L x 12” W x 21” H. The height of this structure shall not increase the overall height of the apparatus. This box shall be located on the top of the truck and run adjacent to the hose bed on the officer’s side. The rear end shall be enclosed while the front end will have a heavy-duty Velcro strap that when secured prevents the stored equipment from moving outside of the enclosure.

SECTION 25 – UNDERBODY SUPPORT SYSTEM

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

The backbone of the support system shall be the chassis frame rails which is the strongest component of the chassis and is designed for sustaining maximum loads.

The support system shall include .375" thick steel vertical angle supports bolted to the chassis frame rails with .625" diameter bolts.

Attached to the bottom of the steel vertical angles shall be horizontal angles, with gussets welded to the vertical members, which extend to the outside edge of the body.

A steel frame shall be mounted on the top of these supports to create a floating substructure which shall result in a minimum 500 lb. equipment support rating per lower compartment.

The floating substructure shall be separated from the horizontal members with isolators. These isolators shall reduce the natural flex stress of the chassis from being transmitted to the body.

Isolators shall have a broad load range, proven viability in vehicular applications, be of a failsafe design and allow for all necessary movement in three (3) transitional and rotational modes.

The isolators shall be installed in a modified V three (3)-point mounting pattern to reduce the natural flex of the chassis being transmitted to the body.

A design with body compartments hanging on the chassis in an unsupported fashion shall not be acceptable.

SECTION 26 – LADDER/EQUIPMENT STORAGE TUNNEL

26-1 General

The ladders shall be stored inside the hose bed, on the passenger's side. Each ladder shall lie in a "vertical suitcase" position in separate stainless-steel storage troughs. The ladders will preferably not extend into the basket area. Rear of ladder storage area shall have a bright aluminum treadplate door to contain the ladder/equipment storage tunnel. The ladder troughs will store one (1) 24' extension ladder, one (1) 14' roof ladder, and one (1) folding ladder.

26-2 Pike Pole (Fire Hooks Unlimited)

Aluminum tubing shall accommodate the storage of two (2) pike poles located in the ladder compartment. This tubing shall be capable of storing maximum 12' long poles, with one (1) pole having a "D" handle.

26-3 Dry-Wall Hook (Fire Hooks Unlimited)

Aluminum tubing shall be used for the storage of two (2) sheet rock hooks located in the ladder compartment. This tubing shall be capable of storing maximum 12' long hooks, with one (1) hook having a "D" handle.

SECTION 27 – PUMP/PUMP ACCESSORIES/PLUMBING

27-1 General

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

Pump shall be the class "A" type.

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

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

Pump body shall be close-grained gray iron, bronze fitted, and horizontally split in two (2) sections for easy removal of the entire impeller shaft assembly (including wear rings).

Pump shall be designed for complete servicing from the bottom of the truck, without disturbing the pump setting or apparatus piping.

Pump case halves shall be bolted together on a single horizontal face to minimize chance of leakage and facilitate ease of reassembly. No end flanges shall be used.

Discharge manifold of the pump shall be cast as an integral part of the pump body assembly and shall provide a minimum of three (3) 3.50" openings for flexibility in providing various discharge outlets for maximum efficiency.

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

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

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

Stuffing boxes shall be of the conventional two (2) piece, split-gland type, to permit adjustment or replacement of Grafoil packing without disturbing the pump. Water shall be fed into stuffing box lantern rings for proper lubrication and cooling when the pump is operating.

Lantern rings shall be located at the inner ends of the stuffing boxes, to avoid having to remove them when replacing pump packing.

Wear rings shall be bronze and easily replaceable to restore original pump efficiency and eliminate the need to replace the entire pump casing due to wear.

27-2 Pump Transmission
Pump transmission shall be made of a three (3) piece, aluminum, horizontally split casing. Power transfer to pump shall be through a high strength Morse HY-VO silent drive chain.

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

27-3 Air Pump Shift
Pump shift engagement shall be made by a two (2) position sliding collar, actuated pneumatically (by air pressure), with a three (3) position air control switch located in the cab. A manual back-up shift control shall also be located on the driver's side pump panel.

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

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

The pump shift control in the cab shall be illuminated to meet NFPA requirements.

27-4 Transmission Lock-up
The direct gear transmission lock-up for the fire pump operation shall engage automatically when the pump shift control, in the cab, is activated.

27-5 Auxiliary Cooling System
A supplementary heat exchange cooling system shall be provided to allow the use of water from the discharge side of the pump for cooling the engine water. Heat exchanger shall be cylindrical type and shall be a separate unit. It shall be installed in the pump or engine compartment with the control located on the pump operator's control panel. Exchanger shall be plumbed to the master drain valve.

27-6 Intake Relief Valve
An Elkhart relief valve shall be installed on the suction side of the pump preset at 125 psig.

Relief valve shall have a working range of 75 psig to 250 psig.

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

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

27-7 Relief Valve
A Waterous adjustable relief valve, specially designed for fire service, shall be provided.

Valve shall be positive, quick acting, and include an instantaneous on/off control. When in the off position, the relief valve shall functionally be removed from the system. When turned back to the on position, the relief valve shall again monitor and maintain the previous pressure setting.

Control for adjusting pressure shall be elliptical shaped for positive grip.

An easily removable pilot valve strainer shall be provided and be accessible from the pump operator's panel.

Two (2) indicator lights shall be furnished, showing the position of the relief valve (amber for open and green for closed).

27-8 Primer

An electric pump priming system shall be furnished with the apparatus. It shall consist of a rotary vane priming pump, driven by a 12-volt electric motor.

All rotating parts of the pump shall be made of corrosion resistant aluminum, stainless steel, or laminated phenolic.

Pump cylinder shall be made of aluminum alloy, hard anodized and Teflon coated, for corrosion resistance and long life.

The primer shall be built by the manufacturer of the fire pump.

A control located at the pump control panel shall operate the primer.

When dry, the pump system shall be capable of taking suction through 20 feet of hard suction hose and discharging water in not more than the time allowed by current NFPA 1901 standard. Also, rated capacity of the pump shall be achieved at the lift stated in current NFPA 1901 standard table.

27-9 Plumbing

All inlet and outlet plumbing, 3.00" and smaller, shall be plumbed with either stainless steel pipe or synthetic rubber hose reinforced with high-tensile polyester braid. All inlet and outlet plumbing greater than 3.00” shall be plumbed with galvanized steel. Small diameter secondary plumbing such as drain lines shall be stainless steel, brass or hose.

Where vibration or chassis flexing may damage or loosen piping or where a coupling is required for servicing, the piping shall be equipped with Victaulic or rubber couplings.

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

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

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

27-10 Main Pump Inlets

A 6.00" pump manifold inlet shall be provided on each side of the vehicle. The suction inlets shall include removable die cast zinc screens that are designed to provide cathode protection for the pump, thus reducing corrosion in the pump.

The main pump inlets shall have National Standard Threads with a long handle chrome cap.

The cap shall be designed to automatically relieve stored pressure in the line when disconnected.

27-11 Short Suction Tubes
The suction tubes on the midship pump shall have "short" suction tubes to allow for installation of adapters without excessive overhang.

27-12 Valves
All ball valves shall be Akron Brass in-line valves. The Akron valves shall be the heavy-duty style with a stainless-steel ball and a simple two-seat design. No lubrication or regular maintenance is required on the valve.

Valves shall have a MINIMUM ten (10) year warranty.

27-13 Inlet (Driver's Side)
On the left side pump panel shall be one (1) 2.50" auxiliary suction terminating in 2.50" National Standard Hose Thread. The auxiliary suction shall be provided with a strainer, chrome swivel and plug.

One (1) hose tray shall be recessed in the driver's side running board and have a strap to secure hose.

Capacity of the tray shall be 30' - 3.00" double jacket.

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

The location of the valve for the inlet shall be recessed behind the pump panel.

27-14 Inlet (Passenger's Side)
On the right-side pump panel shall be one (1) 2.50" auxiliary suction terminating in 2.50" National Standard Hose Thread. The auxiliary suction shall be provided with a strainer, chrome swivel and plug.

The location of the valve for the inlet shall be recessed behind the pump panel.

27-15 Inlet Control
Control for the side auxiliary inlets shall be located at the inlet valve.

27-16 Inlet Bleeder Valve
A .75" bleeder valve shall be provided for each side gated inlet. The valves shall be located behind the panel with a swing style handle control extended to the outside of the panel. The handles shall be chrome plated and provide a visual indication of valve position. The swing handle shall provide an ergonomic position for operating the valve without twisting the wrist and provides excellent leverage. The water discharged by the bleeders shall be routed below the chassis frame rails.

27-17 Tank to Pump
The booster tank shall be connected to the intake side of the pump with heavy duty piping and a quarter turn 3.00" full flow line valve with the control remotely located at the operator's panel. Tank to pump line shall run straight (no elbows) from the pump into the front face of the water tank and angle down into the tank sump. A rubber coupling shall be included in this line to prevent damage from vibration or chassis flexing.

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

27-18 Tank Refill
A 1.50" combination tank refill and pump re-circulation line shall be provided, using a quarter-turn full flow ball valve controlled from the pump operator's panel.

27-19 Discharge Outlets (Driver's Side)
There shall be two (2) discharge outlets with a 2.50" valve on the left side of the apparatus, terminating with a male 2.50" National Standard hose thread adapter.

27-20 Discharge Outlets (Passenger's Side)
There shall be two (2) discharge outlet valves on the right side of the apparatus.

One of these will be a 2.50" valve terminating with a male 2.50" National Standard hose thread adapter.

One of these discharges will be a 4" valve terminating with a 4" LDH outlet with cap.

27-21 2 1/2" Discharge Caps
Chrome plated, rocker lug, caps with chains shall be furnished for all side discharge outlets.

The caps shall be VLH, which incorporates a thread design to automatically relieve stored pressure in the line when disconnected.

27-22 Outlet Bleeder Valve
A .75" bleeder valve shall be provided for each outlet 1.50" or larger. Automatic drain valves are acceptable with some outlets if deemed appropriate with the application.

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

27-23 Discharge Outlet Controls
Discharge outlets 2.50" or less shall incorporate a quarter-turn ball valve with the control located at the pump operator's panel. The valve operating mechanism shall indicate the position of the valve. The large diameter discharge shall be controlled with a hand wheel.

27-24 Deluge Riser
A 3.00" deluge riser shall be installed above the pump in such a manner that a monitor can be mounted and used effectively. Piping shall be installed securely so no movement develops when the line is charged. The riser shall be gated and controlled at the pump operator's panel.

The deluge riser shall have a 3.00" four (4)-bolt flange for mounting the monitor.

27-25 Crosslays, Hose Bed
Attempts will be made to keep the overall height of the crosslay hose bed as low to the ground as possible.

Two (2) crosslays with 1.50" outlets shall be provided. Each bed shall be capable of carrying 200 feet of Key Tru-ID 1.75" hose and shall be plumbed with 2.00" i.d. pipe and gated with a 2.00" quarter turn ball valve.

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

One (1) crosslay with a 2.50” outlet shall be provided. The bed shall be capable of carrying 200 feet of Key Tru-ID 2.50” and shall be plumbed with 2.50” plumbing and gated with a 2.50” quarter turn ball valve. THE OUTLET SHALL BE POSITIONED TO ENSURE PROPER OPERATION OF CROSSLAY REGARDLESS OF WHAT SIDE OF THE TRUCK THE CROSSLAY IS EXTENDED – Attention must be paid to the weight of a charged 2.50” crosslay and the potential for the hose to be pinched if the opening in the hose tray is too close to the edge.

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

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

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

Crosslay bed flooring shall consist of removable perforated brushed aluminum.

27-26 Bumper Storage Box Compartment
A bumper storage compartment, constructed of aluminum, shall be placed in the center of the bumper extension. The compartment shall have a 300-pound capacity with minimum interior dimensions of 55” L x 15” W x 15” H. The box lip shall raise approximately .25” above the bumper to prevent water from the outside entering the compartment.

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

The compartment lid shall have a rubber seal that runs along the perimeter to also aid in preventing water from entering the compartment. The lid shall have two (2) pneumatic cylinders to aid in the opening/closing of the lid. The lid shall have the ability to remain in an open position without assistance from firefighting personnel. When opened, it shall not obstruct the full dimensions specified above.

The front compartment door shall be part of the front bumper and fold down when opened. There shall be two latch mechanisms on both sides that will secure door to the bumper. Once the compartment lid is shut and then the front compartment door is latched, the compartment shall be completely enclosed.

A PICTURE IS AVAILABLE UPON REQUEST TO FURTHER ILLUSTRATE THIS DESIGN.

27-27 Pump Compartment
The pump compartment shall be separate from the hose body and compartments so that each may flex independently of the other. It shall be a fabricated assembly of steel tubing, angles and channels which supports both the fire pump and the side running boards.

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

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

27-28 Pump Mounting

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

SECTION 28 – PUMP PANEL

28-1 Pump Control Panels (Driver's Side Control)

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

Layout of the pump control panel shall be ergonomically efficient and systematically organized.

The pump operator's control panel shall be removable in two (2) main sections for ease of maintenance:

The upper section shall contain sub panels for the mounting of the pump pressure control device, engine monitoring gauges, electrical switches. Sub panels shall be removable from the face of the pump panel for ease of maintenance. Below the sub panels shall be located all valve controls and line pressure gauges.

The lower section of the panel shall contain all inlets, outlets, and drains.

All push/pull valve controls shall have 1/4 turn locking control rods with polished chrome plated zinc tee handles. Guides for the push/pull control rods shall be chrome plated zinc castings securely mounted to the pump panel. Push/pull valve controls shall be capable of locking in any position. The control rods shall pull straight out of the panel and shall be equipped with universal joints to eliminate binding. The suction intake valve will be a swivel variety type. The LDH discharge valve shall be a chrome hand wheel type. IT IS IMPERATIVE THAT THE ALL VALVES ON THE PUMP PANEL BE CAPABLE OF FULLY OPENING AND CLOSING REGARDLESS OF THE POSITION OF THE SUCTION INTAKE VALVE WHEN CONNNECTED TO 5" HOSE.

28-2 Identification Tags

The identification tag for each valve control shall be recessed in the face of the operating valves.

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

All line pressure gauges shall be mounted directly above the corresponding discharge control handles and recessed within the same chrome plated casting as the rod guide for quick identification. The gauge and rod guide casting shall be removable from the face of the pump panel for ease of maintenance. The casting shall be color coded to correspond with the discharge identification tag.

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

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

Trim rings shall be installed around all inlets and outlets.

The trim rings for the side discharge outlets shall be color coded and labeled to correspond with the discharge identification tag.

28-3 Pump Panel Configuration

The pump panel configuration shall be arranged and installed in an organized manner that shall provide user-friendly operation.

28-4 Pump and Gauge Panels
The pump and gauge panels shall be constructed of black vinyl covered aluminum, to allow easy identification of the gauges and controls and to eliminate glare.

The black vinyl shall be bonded to the aluminum, by the company that supplies the product.

A polished aluminum trim molding shall be provided around each panel.

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

28-5 Pump Compartment Light
A pump compartment light shall be provided inside the right-side pump enclosure and accessible through a door on the pump panel.

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

28-6 Pump Panel Gauges and Controls
The following shall be provided on the pump and gauge panels in a neat and orderly fashion:

One (1) with LED display of the following:

Engine oil pressure

Engine temperature

Engine rpm

Alternator voltage

Also provided at the pump panel shall be the following:

- Master Pump Drain Control

- Engine Throttle

28-7 Air Horn Switch
An air horn control switch shall be provided at the pump operator's control panel. This switch shall be red and properly labeled and put within easy reach of the operator in the electrical switch panel.

28-8 Gauges, Vacuum and Pressure
The pump vacuum and pressure gauges shall be liquid filled and manufactured by Class 1, Inc.

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

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

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

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

28-9 Individual Line Pressure Gauges
The individual "line" pressure gauges for the discharges shall be interlube filled and manufactured by Class 1.

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

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

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

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

28-10 Water Level Gauge
An electronic water level gauge shall be provided on the operator's panel that registers water level by means of five colored LED lights. The lights shall be durable, ultra-bright five LED design viewable through 180 degrees. The water level indicators shall be as follows:

- 100% = Green

- 75% = Yellow

- 50% = Yellow

- 25% = Yellow

- Refill = Red

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

The level measurement shall be based on the sensing of head pressure of the fluid in the tank.

The display shall be constructed of a solid plastic material with a chrome plated die cast bezel to reduce vibrations that can cause broken wires and loose electronic components. The encapsulated design shall provide complete protection from water and environmental elements. An industrial pressure transducer shall be mounted to the outside of the tank. The field calibratable display measures head pressure to accurately show the tank level.

28-11 Light Shield
There shall be a polished, 16-gauge stainless steel light shield installed over the pump operator’s panel.

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

One (1) pump panel light shall come on when the pump is in ok to pump mode.

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

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

SECTION 29 – AUDIBLE WARNING DEVICES

29-1 Air Horn System
Two (2) Grover air horns shall be provided and located, in the front bumper, recessed one (1) each side. The horn system shall be piped to the air brake system wet tank utilizing 0.38" tubing. A pressure protection valve shall be installed in-line to prevent loss of air in the air brake system.

29-2 Air Horn Control
Two (2) lanyard rope pull controls shall be provided, one (1) within reach of the driver and one (1) within reach of the officer.

29-3 Electronic Siren
A "Code 3", electronic siren with noise canceling microphone shall be provided.

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

29-4 Speaker
There shall be one (1) Code-3 speaker with chrome finish provided connected to the siren amplifier.

The speaker shall be recessed in the front bumper or grille.

29-5 Mechanical Siren
A Federal Q2B siren shall be installed. A siren brake button shall be installed on the switch panel.

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

The mechanical siren shall be mounted on top of the deck plate on the front bumper on the left side or in the center of the grille. The siren shall be supported by the bumper framework.

The mechanical siren shall be actuated by a foot switch on the officer's side.

SECTION 30 – EMERGENCY WARNING LIGHTING

30-1 Cab Roof Lightbar

There shall be one (1) 72.00" Whelen Freedom, LED lightbar mounted on the cab roof.

This lightbar shall include the following:

Two (2) red flashing forward facing LED modules.

Two (2) white flashing forward facing LED modules.

Two (2) red flashing front corner LED modules.

One (1) red flashing driver side facing LED module.

One (1) red flashing officer side facing LED module.

There shall be one (1) switch located in the cab on the switch panel to control this lightbar.

The color of the lenses shall be clear.

The white LED lights shall be deactivated when the parking brake is applied.

30-2 Lights, Front Zone Lower

One (1) pair of Whelen flashing LED lights shall be installed on the cab face above the headlights, in a common bezel with the directional lights.

The color of these lights shall be red.

These lights shall meet or exceed NFPA front lower zone requirements.

Per NFPA, these lights shall be activated by a switch in the cab.

30-3 Side Zone, Lower

Six (6) Whelen flashing super LED lights shall be located at the following positions:

Two (2) lights one (1) located each side on the front bumper extension - red lens each side.

Two (2) lights one (1) located each side of the lower rear on crew cab - red lens each side.

Two (2) lights one (1) located each side in the rear fender panels - red lens each side.

The lights shall be controlled by a lighted switch on the cab instrument panel.

These lights shall be installed with polished trim flange kits.

30-4 Rear Zone Lower

There shall be two (2) Whelen, red lens lights located at the rear of the apparatus.

Each light shall be mounted in the Whelen housing.

30-5 Warning Lights (Rear of Hose Bed)

Two (2) LED warning beacons shall be provided at the rear of the truck, located one (1) each side. These lights shall be activated by a lighted switch on the instrument panel.

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

The rear warning lights shall be mounted on top of the compartmentation with all wiring totally enclosed.

SECTION 31 -PAINT

31-1 - General

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

1. Manual Surface Preparation - All exposed metal surfaces on the custom cab and body shall be thoroughly cleaned and prepared for painting. Surfaces that shall not be painted include all chrome plated, polished stainless steel, anodized aluminum and bright aluminum treadplate. Each imperfection on the exterior metal surface shall be removed or filled and then sanded smooth for a smooth appearance. All seams shall be sealed before painting.

2. Chemical Cleaning and Treatment - The metal surfaces shall be properly cleaned using a high pressure and high temperature acid etching system. Surfaces are chemically cleaned to remove all dirt, oil, grease and metal oxides to ensure the subsequent coatings bond well. An ultra-pure water final rinse shall be applied to all metal surfaces, excluding undercarriage components, at the conclusion of the metal treatment process.

3. Primer/Surfacer Coats - A two (2) component urethane primer/surfacer shall be hand applied to the chemically treated metal surfaces to provide a strong corrosion protective base coat and to smooth out the surface.

4. Hand Sanding - The primer/surfacer coat shall be lightly sanded to an ultra-smooth finish.

5. Sealer Primer Coat - A two (2) component sealer primer coat shall be applied over the sanded primer.

6. Topcoat Paint - Urethane base coat shall be applied to opacity for correct color matching.

7. Clear coat - Two (2) coats of an automotive grade two (2) component urethane shall be applied. Lap style doors shall be clear coated to match the body. Roll-up doors shall not be clear coated and the standard roll-up door warranty shall apply.

All removable items such as brackets, compartment doors, door hinges, trim, etc. shall be removed and painted separately to insure paint behind all mounted items. Body assemblies that cannot be finish painted after assembly shall be finish painted before assembly.

The cab, doors (except rear) and the body shall be painted #90 “Candy Apple Red”.

Prior to reassembly and reinstallation of lights, handrails, door hardware and any miscellaneous items an isolation tape, gasket or dielectric material shall be used to prevent damage to the finish painted surfaces (no exceptions). A nylon washer shall be installed under each acorn nut or metal screw that is fastened directly to an exterior painted surface.

31-2 Environmental Impact

The contractor shall meet or exceed his current State regulations concerning paint operations.

- Topcoats and primers shall be chrome and lead free.

- Metal treatment chemicals shall be chrome free. The wastewater generated in the metal treatment process shall be treated on-site to remove any other heavy metals.

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

31-3 Chassis Frame Assembly

The chassis frame assembly shall be painted black before the installation of the cab and body, and before installation of the engine and transmission assembly, air brake lines, electrical wire harnesses, etc. Components that are included with the chassis frame assembly that shall be painted black are frame rails, cross members, axles, suspension, steering gear, fuel tank, body substructure supports, miscellaneous mounting brackets, etc.

31-4 Compartment Interiors

Interior of compartmentation shall be painted with gray spatter type paint.

SECTION 32 - REFLECTIVE TAPE

32-1 Reflective Band
A 5.00" white reflective band shall be provided across the front of the vehicle and along the sides of the chassis cab and apparatus body.

The reflective band provided on the cab face shall be at the headlight level.

32-2 Stripe, Reflective, "S" Ribbon
"S" type ribbons shall be added to the reflective stripe match the customer's existing fleet. Areas adjacent to the "S" portion of the stripe shall be shaded and highlighted with an air brush to give it a ribbon affect.

32-3 Outline, Reflective Stripe
A black outline shall be applied on the top and the bottom of the reflective band. There shall be one (1) set of outline stripes required.

32-4 Chevron Striping, Rear
There shall be alternating chevron striping located on the rear-facing vertical surface of the apparatus. The rear surface, excluding the rear compartment door, shall be covered.

The colors shall be red and fluorescent yellow diamond grade.

Each stripe shall be 6.00" in width.

This shall meet the requirements of the most current edition of NFPA 1901.

32-5 Reflective Stripe, Cab Doors
A 6.00" x 16.00" white reflective stripe shall be provided across the interior of each cab door. The stripe shall be located approximately 1.00" up from the bottom, on the door panel.

This stripe shall meet the NFPA 1901 requirement.

32-6 Lettering
The lettering shall be totally encapsulated between two (2) layers of clear vinyl.

Forty-one (41) to sixty (60) genuine gold leaf letters, 3.00" high, with outline and shade shall be provided.

32-7 Maltese Cross Insignias

There shall be one (1) pair of Maltese crosses, comprised of genuine gold leaf material, provided and installed on the rear cab doors.

SECTION 33 - SERVICE MANUALS

33-1 CD Manual, Parts

A custom parts manual for the complete fire apparatus shall be provided in CD format with the completed unit.

The manual shall contain the following:

- Job number
- Part numbers with full descriptions
- Table of contents
- Parts section sorted in functional groups reflecting a major system, component, or assembly
- Parts section sorted in Alphabetical order
- Instructions on how to locate parts

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

33-2 CD Manuals, Chassis Service

Two (2) CD format chassis service manuals containing parts and service information on major components shall be provided with the completed unit.

The manual shall contain the following sections:

- Job number
- Table of contents
- Troubleshooting
- Front Axle/Suspension
- Brakes
- Engine
- Tires
- Wheels
- Cab
- Air Systems
- Plumbing
- Appendix

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

33-3 CD Manual, Chassis Operation

Two (2) CD format chassis operation manuals shall be provided.

33-4 Pump Manuals
Two (2) pump manuals from the pump manufacturer shall be furnished in compact disc format with the apparatus. Manuals shall cover pump operation, maintenance, and parts.

SECTION 34 - WARRANTIES – Include Warranty Certificates for Each Item Below with Response

34-1 Two (2) Year Basic Material and Workmanship Warranty

Each new piece of apparatus shall be provided with a minimum two (2) year basic apparatus material and workmanship limited warranty. The warranty shall cover such portions of the apparatus built by the manufacturer as being free from defects in material and workmanship that would arise under normal use and service.

34-2 Engine Warranty
A Cummins five (5) year limited engine warranty shall be provided. A copy of the warranty certificate shall be submitted with the bid package.

34-3 Steering Gear Warranty
A TRW one (1) year limited steering gear warranty shall be provided. A copy of the warranty certificate shall be submitted with the bid package.

34-4 Chassis - Structural Integrity
The chassis frame shall be provided with a fifty (50) year material and workmanship limited warranty. The warranty shall cover the chassis frame as being free from defects in material and workmanship that would arise under normal use and service.

34-5 Cab - Structural Integrity
The new cab shall be provided with a ten (10) year material and workmanship limited warranty. The warranty shall cover such portions of the cab built by the manufacturer as being free from structural failures caused by defects in material and workmanship that would arise under normal use and service.

34-6 Apparatus Body – Structural Integrity
Each new piece of apparatus shall be provided with a ten (10) year material and workmanship limited warranty on the apparatus body. The warranty shall cover such portions of the apparatus built by the manufacturer as being free from defects in material and workmanship that would arise under normal use and service.

34-7 Front Axle Two (2) Year Material and Workmanship Warranty
A Meritor™ Axle 2-year limited warranty shall be provided.

34-8 Front Axle Two (2) Year Material and Workmanship Warranty
A Meritor™ Axle 2-year limited warranty shall be provided.

34-9 Ten (10) Year Paint and Corrosion
Each new piece of apparatus shall be provided with a ten (10) year pro-rated paint and corrosion limited warranty on the apparatus cab, body, and doors. The warranty shall cover painted exterior surfaces to be free from blistering, peeling, corrosion, or any other adhesion defect caused by defective manufacturing methods or paint material selection that would arise under normal use and service.

34-10 Transmission
The transmission shall have a five (5) year/unlimited mileage warranty covering 100 percent parts and labor. The warranty is to be provided by Allison Transmission and not the apparatus builder.

34-11 Water Tank
The UPF poly water tank shall be provided with a lifetime material and workmanship limited warranty.

34-12 Roll Up Door Material and Workmanship
A Gortite roll-up door limited warranty shall be provided. The mechanical components of the roll-up door shall be warranted against defects in material and workmanship for the lifetime of the vehicle. A six (6) year limited warranty shall be provided on painted and satin roll up doors.

34-13 Pump
A Waterous five **(5) year** warranty shall be provided for the pump.

34-14 Pump Plumbing
The stainless-steel plumbing components and ancillary brass fittings used in the construction of the water plumbing system shall be warranted for a period of ten (10) years or 100,000 miles. This covers structural failures caused by defective design or workmanship, or perforation caused by corrosion, provided the apparatus is used in a normal and reasonable manner. This warranty is extended only to the original purchaser for a period of ten years from the date of delivery. A copy of the warranty shall be submitted with the bid.

34-15 Paint and Corrosion
Each new piece of apparatus shall be provided with a ten (10) year pro-rated paint and corrosion limited warranty on the apparatus body. The warranty shall cover painted exterior surfaces of the body to be free from blistering, peeling, corrosion, or any other adhesion defect caused by defective manufacturing methods or paint material selection that would arise under normal use and service.

34-16 Gold Leaf Lamination
The gold leaf lamination shall be provided with a five (5) year material and workmanship limited warranty. The warranty shall cover the gold leaf lamination as being free from defects in material and workmanship that would arise under normal use and service.

34-17 Anti- Lock Brake System Warranty
The Wabco ABS system shall come with a **three (3) year or 300,000-mile parts and labor** warranty provided by Meritor Wabco Vehicle Control Systems.

34-18 Gauges, Vacuum and Pressure
These gauges shall include a 10-year warranty against leakage, pointer defect, and defective bourdon tube.

SECTION 35 - CERTIFICATIONS AND TESTING

35-1 Vehicle Stability

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

35-2 Engine Installation

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

35-3 Power Steering

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

35-4 Cab Integrity

The fire apparatus manufacturer shall provide a cab integrity certification with this proposal. The certification shall state that a specimen representing the substantial structural configuration of the cab has been tested and certified by an independent third-party test facility. Testing events shall be documented with photographs, real-time and high-speed video, vehicle accelerometers, cart accelerometers, and a laser speed trap. The fire apparatus manufacturer shall provide a state licensed professional engineer to witness and certify all testing events. Testing shall meet or exceed the requirements below:

- European Occupant Protection Standard ECE Regulation No.29.

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

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

<u>- Roof Crush</u>

The cab shall be subjected to a roof crush force of 22,500 lb. This value meets the ECE 29 criteria, and is equivalent to the front axle rating up to a maximum of ten (10) metric tons.

<u>- Side Impact</u>

The same cab shall be subjected to dynamic preload where a 13,275-lb moving barrier is slammed into the side of the cab at 5.50 mph, striking with an impact of 13,000 ft-lb of force. This test is part of the SAE J2422 test procedure and more closely represents the forces a cab shall see in a rollover incident.

<u>- Frontal Impact</u>

The same cab shall withstand a frontal impact of 32,600 ft-lb of force using a moving barrier in accordance with SAE J2420.

<u>- Additional Frontal Impact</u>

The same cab shall withstand a frontal impact of 65,200 ft-lb of force using a moving barrier. (Twice the force required by SAE J2420)

The same cab shall withstand all tests without any measurable intrusion into the survival space of the occupant area.

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

35-5 Windshield Wiper Durability
Visibility during inclement weather is essential to safe apparatus performance. Windshield wipers shall survive a 3 million cycle durability test in accordance with section 6.2 of SAE J198 *Windshield Wiper Systems - Trucks, Buses and Multipurpose Vehicles.* The bidder shall certify that the wiper system design has been tested and that the wiper system has met these criteria.

35-6 Testing of Body Design
Body structural analysis shall be fully tested. Proven engineering and test techniques such as finite element analysis, stress coating and strain gauging shall be performed with special attention given to fatigue, life and structural integrity of the cab, body and substructure.

Body shall be tested while loaded to its greatest in-service weight.

The criteria used during the testing procedure shall include:

- The raising of opposite corners of the vehicle tires 9.00" to simulate the twisting a truck may experience when driving over a curb.

- Making a 90 degree turn, while driving at 20 mph to simulate aggressive driving conditions.

- Driving the vehicle at 35 mph on a washboard road.

- Driving the vehicle at 55 mph on a smooth road.

- Accelerating the vehicle fully, until reaching the approximate speed of 45 mph on rough pavement.

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

35-7 AMP Draw Report
The bidder shall provide, at the time of bid and delivery, an itemized print out of the expected amp draw of the entire vehicle's electrical system.

The manufacturer of the apparatus shall provide the following:

1) Documentation of the electrical system performance tests.

2) A written load analysis, which shall include the following:

A) The nameplate rating of the alternator.

B) The alternator rating under the conditions specified per:

- Applicable NFPA 1901 or 1906 (Current Edition).

C) The minimum continuous load of each component that is specified per:

- Applicable NFPA 1901 or 1906 (Current Edition).

D) Additional loads that, when added to the minimum continuous load, determine the total connected load.

E) Each individual intermittent load.

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

35-8 Apparatus Delivery Tests and Delivery

Apparatus shall be delivered under its own power - rail or truck freight shall not be acceptable. A qualified delivery engineer representing the contractor shall deliver the apparatus and remain for a sufficient length of time to instruct personnel in the proper operation, care and maintenance of the equipment delivered. A road test shall be conducted with the apparatus fully loaded and a continuous run of ten (10) miles or more shall be made under all driving conditions, during which time the apparatus shall show no loss of power or overheating. The transmission drive shaft or shafts, and rear axles shall run quietly and be free from abnormal vibration or noise throughout the operating range of the apparatus. Vehicle shall adhere to the following parameters:

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

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

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

D) The apparatus, fully loaded, shall be capable of obtaining a speed of 50 mph on a level concrete highway with the engine not exceeding its governed rpm (full load).

35-9 Failure to Meet Test

In the event the apparatus fails to meet the test requirements of these specifications on the first trial, second trials may be made at the option of the bidder within 30 days of the date of the first trial. Such trials shall be final and conclusive and failure to comply with these requirements shall be cause for rejection. Failure to comply with changes to conform to any clause of the specifications, within 30 days after notice is given to the bidder of such changes, shall also be cause for rejection of the apparatus. Permission to keep or store the apparatus in any building owned or occupied by the purchaser or its use by the purchaser during the above-specified period with the permission of the bidder shall not constitute acceptance.

35-10 Pump Test

The rated water pump shall be tested, approved, and certified by an ISO certified independent third-party testing agency at the manufacturer's expense. The test results, along with the pump manufacturer's certification of hydrostatic test, the engine manufacturer's certified brake horsepower curve, and the manufacturer's record of pump construction details shall be forwarded to the Fire Department.

City of Murray Kentucky Fire Department
Pumper Specifications

SECTION 36 – INSTALLED EQUIPMENT Prior to the ordering of any equipment/mounts, the manufacturer's representative will meet with the Fire Chief to review the model numbers and/or sizes to ensure the equipment is the most appropriate size and/or model number. It shall be of utmost importance that all equipment functions as designed when used with the apparatus and the apparatus function as designed when used with the equipment.

Exact locations of mountings will be determined at manufacturer visit meeting. Insert a bid price on the lines below for each item(s). You will submit the total cost for all "mounted equipment" in Section 41.

36-1 Flashlights **Bid Price**

Qty 4 - Streamlight Fire Vulcan LED Vehicle Mount System 44451 Orange – 2 Front Cab/2 Rear Cab

36-2 Ground Ladders

Qty 1 - 14' aluminum roof ladder

Qty 1 - 24' aluminum two (2) section extension

Qty 1 – 10' aluminum folding attic ladder

36-3 Thermal Imager

Qty 1 – Bullard Thermal Imager QXTBundle Orange, XTETT Electronic Thermal Throttle, XTZOOM Digital Zoom, XTRETRACT Lanyard – Charger mounted near officer's seat

36-4 Nozzle/Coupling/Reducer Mounts

Qty 2 – 2.5" Spring loaded

Qty 2 – 1.5" Spring loaded

Qty 1 – Screw in mount for 2.5" Double female

36-5 Appliances/Hose Tools/Water Supply Tools

Qty 1 - Qty 1 – TFT Suction Intake AZ3ST-NX with cap and screen

Qty 1 – 5" storz elbow connection with 5" Blind Cap – LDH Discharge

Qty 1 – Elkhart Hydrant & Spanner Wrenches with Holder Mount

Qty 1 – Storz Spanner Wrenches with Holder Mount

36-6 Mounts (Other)

Qty 1 – Irons (Fire Hooks Unlimited Slot Flat Axe LS-8/ Maxximus Bar with PAC Trac Mounting

Qty 1 – Fire Hooks Unlimited 8 lb. Sledge SHF-8 with PAC Trac Mounting

Qty 1 – Fire Hooks Unlimited Bolt Cutters NCBC36 with PAC Trac Mounting

Qty 1 – Fire Hooks Unlimited Flat Head Axe FA-8 with Mount – Rear of cab exterior

Qty 1 – Fire Hooks Unlimited Pick Head Axe FAP-8 with Mount – Rear of cab exterior

Qty 1 – Akron Brass Spanner Wrenches and Mounting Plate SS-523-MP

Qty 1 – Mount/strap to hold extrication tool power unit - passenger side compartment 3

Qty 1 – Mount/strap to hold extrication spreader - passenger side compartment 3

Qty 1 – Mount/strap to hold extrication cutter - passenger side compartment 3

Qty 1 – Mount/strap to hold extrication ram - passenger side compartment 3

36-7 Unit ID Placards **Bid Price**

Qty 3 – E1 Body Placards - White colored aluminum plate that will fit snugly into placard holders. Shall display 10" red reflective lettering/numerals "E1". The lettering/numerals shall be totally encapsulated between two (2) layers of clear vinyl.

Qty 3 – E11 Body Placards - White colored aluminum plate that will fit snugly into placard holders. Shall display 10" red reflective lettering/numerals "E11". The lettering/numerals shall be totally encapsulated between two (2) layers of clear vinyl.

Qty 1 – E1 Bumper Placard - White colored aluminum plate that will fit snugly into placard holders. Shall display "E1" red reflective lettering/numerals appropriately sized to fit in the center of the front bumper. The lettering/numerals shall be totally encapsulated between two (2) layers of clear vinyl.

Qty 1 – E11 Bumper Placard - White colored aluminum plate that will fit snugly into placard holders. Shall display "E11" red reflective lettering/numerals appropriately sized to fit in the center of the front bumper. The lettering/numerals shall be totally encapsulated between two (2) layers of clear vinyl.

36-8 Unit ID Placard Holders

Qty 3 – Body Placard Holders - Holders for these placards shall be stainless steel or aluminum, secured to the truck and allow for top removal of the placards.

Qty 1 – Bumper Placard Holders - Holders for these placards shall be stainless steel or aluminum, secured to the truck and allow for top removal of the placards.

36-9 IPad Mount – (Front Dash Near Officer Seat)

Qty 1 – Havis IPad Mount – Shall accommodate IPad Pro 11" – 12.9" Models

36-10 Extinguishers – (Compartment 3 Top)

Qty 1 – Ansul Sentry W02-1 2.5 430847 Gallon Water Extinguisher with Mount

Qty 1 – 10 BC Carbon Dioxide Extinguisher with Mount

Qty 1 – 80 BC Dry Chemical Extinguisher with Mount

36-11 Nozzles/Nozzle Accessories

Qty 1 – Elkhart Stinger Nozzle 2.0 with LDH Inlet Base _____

Qty 1 – Elkhart Stinger Nozzle Anchor Kit _____

Qty 1 – Elkhart Stinger Nozzle Truck Mount Adapters _____

Qty 1 – Elkhart SM-1250 Nozzle _____

Qty 1 – Elkhart Stream Shaper 282-A _____

Qty 1 – Elkhart Quad Stacked Tips ST-194 _____

Qty 1 – Akron Piercing 6' Nozzle 1829 – Mount location to be determined

36-12 Miscellaneous

Qty 1 – 4' D Handle Fire Hooks Unlimited Universal Hook

Qty 1 – 8' Fire Hooks Unlimited Universal Hook

Qty 1 – 4' D Handle Fire Hooks Unlimited Dry-Wall Hook

Qty 1 – 8' Fire Hooks Unlimited Dry-Wall Hook

Qty 2 – Wheel Chocks - Loose

SECTION 37 - LOOSE EQUIPMENT

Prior to the ordering of any loose equipment, the manufacturer's representative will meet with the Fire Chief to review the model numbers and/or sizes to ensure the loose equipment is the most appropriate size and/or model number. It shall be of utmost importance that all loose equipment functions as designed when used with the apparatus and the apparatus function as designed when used with the equipment.

The below equipment shall be furnished with the completed unit. Insert a bid price on the lines below for each item(s). You will submit the total cost for all "loose equipment" in Section 41.

Bid

37-1 Hazardous Materials - *No Exceptions in 37-1

Qty 1 – Rae Systems Q-Rae 3 Monitor with O2/LEL/H2S/CO Sensors _____

37-2 Hose - *No Exceptions in 37-2

Qty 2 – 50' Fire Quip Hydro Flow 5" - Yellow _____
Qty 8 – 100' Fire Quip Hydro Flow 5"– Yellow _____
Qty 20 – 50' Fire Quip Hydro Flow 3" – Red _____
Qty 16 – 50' Key Tru-ID 2.25" – Blue _____
Qty 12 – 50' Key Tru-ID 1 ¾" – Green _____

37-3 Appliances/Hose Tools/Water Supply Tools

Qty 2 – 4.5" LHF Hydrant to 5" Storz with Ears _____
Qty 1 - 5" Storz to 2 ½" Male Reducer _____
Qty 2 **–** Elkhart Adjustable Hydrant Wrench 454
Qty 1 – TFT Pivot In-line Pressure Gauge J25G200S *No Exceptions
Qty 1 – TFT 2.5" Water Thief WT5NJ-NJ-NF *No Exceptions
Qty 1 – TFT F140F Ball Valve
Qty 1 – TFT FSS8 Smooth Bore 7/8" Tip

37-4 Miscellaneous - *No Exceptions in 37-4

Qty 2 – Res-Q-Jack Green Lite X Strut GLX-STRT LONG
Qty 3 - R&B Fabrications HS-100 Hose Strap Hose Pack
Qty 3 – Fire Hooks Unlimited Original Extinguisher Harness CH-312
Qty 1 – Phillips AED
Qty 1 – Akron Steel Electric Cord Reel
Qty 1 – Apple Ipad Pro – Minimum 64MB – WiFi + Cellular – FirstNet Compatible
Qty 2 – SAVA Lift Bag 12" x 12"
Qty 3 – Motorola APX6000 VHF MHZ Model
Qty 3 – Motorola Remote Speaker Microphone XE500
Motorola Radio Hardware
Qty 1 – APX8500 all band MP mobile
Qty 1 – BASE STATION OP APX
Qty 1 – Control Station Power Supply
Qty 1 – All band mobile antenna
Qty 1 – Dash mount E5
Qty 1 – Standard Palm Microphone APX
Qty 1 – APX E5 Control Head

Motorola Radio Software/Programming
Qty 1 – Group Services
Qty 1 – ENH: Smartzone
Qty 1 – UHF Band
Qty 1 – Astro Digital CAI OP APX
Qty 1 – P25 Trunking Software APX
Motorola/Futurecom Vehicle Radio Extender Hardware
Qty 1 – VRX1000 VHF 136-1741 MHZ
Qty 1 – Unity Gain Antenna Quarterwave VHF 150.8-162 Roof Mount
Motorola/Futurecom Radio Extender Software/Programming
Qty 1 – VRX1000 – In band filter kit VHF Plan A
Qty 1 – VRX1000 Programming Kit
Qty 1 – VRX1000 P25 Digital Conventional Operation

SECTION 38 - EXCEPTIONS

Bidders shall complete this section if they will not comply with any of the specifications as outlined in this document. ALL non-compliance items must be listed individually in this section. Attach additional sheets of paper if needed, but follow the same format provided below.

38-1

Section Number

Page Number

Item Description

Proposed Substitute (If applicable)

38-2
Section Number

Page Number

Item Description

Proposed Substitute (If applicable)

38-3
Section Number

Page Number

Item Description

Proposed Substitute (If applicable)

38-4
Section Number

Page Number

Item Description

Proposed Substitute (If applicable)

SECTION 39 – PAYMENT TERMS

39-1 The City of Murray will accept no contract that requires down payments, progressive payments during construction, or contracts with escalator clauses. See SECTION 1-17 for terms of acceptance. No other terms shall be acceptable.

39-2 The bidder shall be aware that it can take up to thirty (30) days to process payment upon receipt of invoice.

39-3 All certificates of origin are to be transferred to the City of Murray and the vehicle shall be titled to the City of Murray by the vendor and delivered with the apparatus.

SECTION 40 – BIDDER QUESTIONNAIRE

Bidders shall provide answers to each of the following questions. Documentation shall be provided upon request. Responses may be included on separate paper if additional room is needed.

1. How long has the manufacturer been building fire apparatus?

2. How many custom pumper apparatus has the manufacturer built in the past five years?

3. Is the manufacturer International Standards Organization 9001 certified?

4. Does the manufacturer have a training program for vehicle operator's that ensures familiarity with all modes of operation and with the proper maintenance procedures?

5. Does the manufacturer have a training program for fire mechanics?

6. List any other customer support services offered by the manufacturer.

7. How long has the dealer been selling this brand of apparatus?

8. How many years of experience do the dealer's sales representative have selling this brand of apparatus?

9. How many fire apparatus has the dealer's sales representative sold?

10. Where is the dealer's parts and service facility located?

11. Does the dealer have mobile service units to provide service in the City of Murray? What is the distance from where these mobile service units are based from Murray?

12. Are all the service technician's factory trained and EVTCC certified?

13. Does the manufacturer have an engineering staff?

14. Does the engineering staff design the cab, chassis, body, electrical system on their apparatus?

15. Does the manufacturing staff build the cab, chassis, body and electrical system on their apparatus?

16. Does the apparatus you are bidding comply with ALL portions of the applicable vehicle standards (NFPA Standards and FMVSS)? List all items that do not.

17. Will the manufacturer perform fatigue life analysis and testing of all structural components on the apparatus model being bid? Provide which tests and results.

18. Has the manufacturer conducted ride quality testing on the apparatus model being bid? Provide which tests and results.

19. Has the manufacturer conducted cab crashworthiness testing on the apparatus model being bid? Provide which tests and results.

20. Has the manufacturer conducted any other analyses or tests as part of the development of the apparatus model being bid? Provide which tests and results.

21. Has the manufacturer submitted their products to an independent, third party company for testing? If so, provide written certification on which components or systems and the results.

22. What is the apparatus frame and frame crossmembers warranty?

23. What is the cab structural warranty?

24. What is the paint warranty?

25. What is the body structural warranty?

26. What is the pump warranty?

27. What is the pump plumbing warranty?

28. What is the water tank warranty?

29. What is the standard warranty for all components manufactured by the apparatus manufacturer and not covered above?

30. What is the current build to delivery time for this vehicle?

30. Are there any other specific warranties, either from the manufacturer or from a component supplier? If so, provide what and how long.

SECTION 41 – BID SUBMISSION COST TOTALS

Submit total costs for each of the listed categories below.

Apparatus: **$** _____

Installed Equipment (Total from Section 36): **$** _____

Loose Equipment (Total from Section 37): **$** _____

Total Overall Bid (Apparatus & Installed Equipment): **$** _____

Written overall total

Company: _____

Contact name: _____

Contact email: _____

Signature
of Bidder: _____Date: _____

Signature of an Authorized Agent on behalf of a Company represents and asserts all the information submitted and all terms and conditions of the bid are verified and accepted by the bidding company. Signatory verifies that they are authorized to sign for the Company. A bid submitted unsigned will not be considered.