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INTENT OF SPECIFICATIONS

It is the intent of these specifications to cover the furnishing and delivery to the City of Franklin, Tennessee of two (2) Custom 4 Door, 6 passenger Quint apparatus with a 2000 GPM Hale Q-MAX-200 Pump and a 500 gallon water tank equipped as hereinafter specified. With a view of obtaining the best results and the most acceptable apparatus for service in the fire department, these specifications cover only the general requirements as to the type of construction and tests to which the apparatus must conform, together with certain details as to finish, equipment and appliances with which the successful bidder must conform. Some details of construction and materials where not otherwise specified are left to the discretion of the successful bidder, who shall be solely responsible for the design and construction of all features. The apparatus shall conform to the requirements of the current (at the time of bid) National Fire Protection Association Pamphlet #1901 for Motor Fire Apparatus unless otherwise indicated in these specifications.

Bids shall only be considered from companies that have an established reputation in the field of fire apparatus construction and have been in this particular business for a minimum of twenty (20) years.

Each bid shall be accompanied by a set of bidder's construction specifications consisting of a detailed description of the apparatus and equipment as bid and to which the apparatus furnished under contract must conform.

The bidder's construction specifications shall indicate size, type, model and make of all component parts and equipment.

QUALITY AND WORKMANSHIP

The design of the apparatus must embody the latest approved automotive engineering practices.

The workmanship must be the highest quality in its respective field. The apparatus shall be designed to allow accessibility to various areas requiring periodic maintenance, ease of operation (including both pumping and driving) and symmetrical proportions.

Construction must be rugged. Ample safety factors must be provided to carry loads as specified and to meet both on and off road requirements and speed as set forth under "Performance Test and Requirements."

PERFORMANCE TESTS AND REQUIREMENTS

Prior to acceptance:

A. A road test shall be documented 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.

B. The transmission drive shaft or shafts, and rear axle shall run quietly and free from abnormal vibration or noise throughout the operating range of the apparatus.

C. The weight distribution of the apparatus, when loaded, shall be approximately 66% on the rear axle. The successful bidder shall furnish a weight certification showing weight on the front and rear axle, and the total weight of the completed apparatus at the time of delivery.

D. The apparatus must be capable of accelerating to 30 MPH from a standing start within 25 seconds on a level concrete highway without exceeding the maximum governed engine RPM.

E. The service brakes shall be capable of stopping the fully loaded vehicle within 35 feet from a speed of 25 MPH on a level concrete highway.

F. The apparatus, fully loaded, shall be capable of obtaining a speed of 50 MPH on a level highway with the engine not exceeding 95% of its governed RPM (full load).

G. The apparatus shall be tested and approved by a third-party testing agency in accordance with their standard practices for pumping engines.

H. The successful bidder shall furnish copies of the Pump Manufacturer's Certification of Hydrostatic Test, the Engine Manufacturer's current Certified Brake Horsepower Curve and the Manufacturer's Record of Construction Details.

FAILURE TO MEET TESTS

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

second set of trials, if necessary, shall be final and conclusive and failure to comply with these requirements shall be cause for rejection by the City. Permission to keep and/or store the apparatus in any building owned or occupied by the City shall not constitute acceptance of same.

EXCEPTIONS TO SPECIFICATIONS

The City expects bidders to adhere strictly to these specifications and all other aspects of this procurement solicitation. Exceptions to these specifications or any other aspect of this procurement solicitation shall be identified by the bidder and considered by the City in accordance with the subsection entitled "Exceptions" of the Instructions to Specifications that accompany these specifications. Failure to denote exceptions in the above manner may result in rejection of the bid. In addition, a general statement taking "TOTAL EXCEPTION" to the specifications shall result in rejection of bid.

GENERAL CONSTRUCTION

The apparatus shall be designed and the equipment mounted with due consideration to distribution of load between the front and rear axles so that all specified equipment, including filled water tank, a full complement of personnel and fire hose shall be carried without injury to the apparatus. Weight balance and distribution shall be in accordance with the recommendations of the International Association of Fire Chiefs and National Fire Association (or American Insurance Association).

DELIVERY REQUIREMENTS

The apparatus shall be driven from the manufacturing facility to the City of Franklin. It shall be completely equipped as per these specifications upon arrival and on completion of the required tests shall be ready for immediate service in the fire department of the City of Franklin. Any alterations required at the scene of delivery to comply with these specifications must be done at the successful bidder's expense.

Vendor specifically acknowledges and accepts City's standard delivery terms as expressed in section 10.b of the separate Instructions to Specifications.

Vendor shall indicate on the separate Bid Submittal Form the estimated time of delivery, measured in number of calendar days after receipt of order.

Delivery shall be made at the following location:

City of Franklin Fire Station 5
215 Noah Drive
Franklin, TN 37064

Manufacturer's Statement of Origin (a.k.a., Certificate of Origin) shall be assigned and issued to:

City of Franklin
109 3rd Ave. South
Franklin, TN 37064

TRAINING

A factory trained representative shall thoroughly demonstrate the complete apparatus operation and maintenance to designated personnel of the City. This shall be done once per day over three (3) consecutive days.

CITY'S ENUMERATED RIGHTS

The City reserves the right to accept or reject any bid and reserves the right to reject all bids. The City also reserves the right to award the procurement in its best interest and reserves the right to waive any formalities. These enumerated rights are in addition to any and all un-enumerated rights enjoyed by the City.

AVAILABILITY OF PARTS

Parts shall be readily available without added costs and delays caused by tariffs and customs.

MANUFACTURER'S EXPERIENCE

Each bidder shall have been in business making similar apparatus for a minimum of twenty (20) years.

ELIMINATION OF DIVIDED RESPONSIBILITY

It is required that each bidder produce both the chassis and complete apparatus. To eliminate divided responsibility and service, the same Company must manufacture the chassis and body. Bidder shall state the number of years the bidder has been producing their own chassis and body.

FAMA COMPLIANCE

Manufacturer must be a current member of the Fire Apparatus Manufacturer's Association.

PRE-CONSTRUCTION CONFERENCE

After award of the contract, and prior to construction of the apparatus, a pre-construction conference shall be held at the facility of the manufacturer. Accommodations for three (3) City personnel to include all usual and customary transportation, meals and one night's lodging shall be included in the bid price.

INSPECTION TRIP

An inspection trip at the manufacturer's facility prior to delivery of the completed apparatus shall be provided. Accommodations for three (3) City personnel to include all usual and customary transportation, meals and one night's lodging shall be included in the bid price.

BID SURETY

A certified check or bid bond in an amount not less than ten percent (10%) of the total bid price shall be included with bid. The bid surety shall provide to the City a guarantee that the bidder will not withdraw its bid and will accept award of the purchase as bid if so awarded or else forfeit the amount of the surety. The full amount of the bid surety shall be returned to the successful bidder, or permitted to expire, upon award of the purchase and receipt by the City of the specified performance bond. The full amount of the bid surety shall be returned to the unsuccessful bidders, or permitted to expire, following the award of the contract to the successful bidder.

PERFORMANCE BOND

Within twenty (20) City business days of notification of the award by the City to the successful bidder, but prior to any work commencing on the bid apparatus, the

successful bidder shall, at its own expense, obtain and submit to the City a performance bond in an amount equal to or greater than 100% of the total contract price. The performance bond shall protect the City from loss due to the successful bidder's inability to deliver the bid apparatus as per the City's bid documents and the successful bidder's submitted bid as accepted by the City. Additionally, in order to demonstrate the economic stability and credit worthiness of the bidder, each bidder must disclose the price it pays per $1,000 for performance bonding.

CHASSIS

The chassis shall be manufactured in the factory of the bidder. The chassis shall be designed and manufactured for heavy-duty service with adequate strength and capacity of all components for the intended load to be sustained and the type of service required. There shall be no divided responsibility in the production of the apparatus.

ALUMINUM CAB

The cab shall be a full tilt 6-person 10" rear raised roof cab designed specifically for the fire service and manufactured by the chassis builder.

Cab shall be built entirely by the apparatus manufacturer within the same facilities. Rear of the cab shall be slanted forward at the top rear for mid-ship aerial use. The outside of the rear cab wall shall be aluminum diamond plate.

CAB DESIGN

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

The apparatus chassis shall be of an engine forward, fully enclosed tilt cab design. There shall be four (4) side entry doors.

The cab shall be of a fully open design with no divider wall or window separating the front and rear cab sections.

Construction of the cab shall consist of high strength 5052H32 aluminum welded to extruded aluminum framing of 6061-T6 material.

The cab roof shall utilize extruded, radiused outer corner rails with integral drip channel and box tubing type cross brace supports.

The cab sides shall be constructed from extruded door pillars and posts that provide a finished door opening, extruded and formed wheel well openings supports, formed aluminum wheel well liners and box tubing type support braces.

The cab floor and rear cab wall shall utilize box tubing type framing and support bracing.

The framework shall be of a welded construction that fully unitizes the structural frame of the cab.

The structural extrusion framework shall be overlaid with interlocked aluminum alloy sheet metal panels to form the exterior skin of the cab.

The structural extrusion framework shall support and distribute the forces and stresses imposed by the chassis and cab loads and shall not rely on the sheet metal skin for any structural integrity.

CAB VISOR COMPARTMENT

The cab shall contain storage space above the front windshield and across the entire front of the cab.

CAB SUB-FRAME

The cab shall be mounted to a steel box tube sub-frame, and shall be isolated from the chassis, through the use of no less than six (6) elastomeric bushings. The sub frame shall be painted to match the primary chassis color.

The sub-frame shall be mounted to the chassis through the use of lubricated Kaiser bushing for the front pivot point, and two (2) hydraulically activated cab latches, to secure the rear.

CAB TILT SYSTEM

An electrically powered hydraulic cab tilt system shall be provided, and shall lift the cab to an angle of 45 degrees, exposing the engine and accessories for service. The system shall be interlocked to only operate when the parking brake is set.

The lift system shall be comprised of two (2) hydraulic lift cylinders, an electrically driven hydraulic pump, and a control switch. A mechanical locking system shall be provided to ensure the cab remains in the raised position in the event of a hydraulic failure.

The cab tilt controls shall be interlocked to the parking brake to ensure the cab shall not move, unless the parking brake is set.

The hydraulic lift cylinders shall be connected to a steel cab sub-frame, and not directly to the cab.

CAB DIMENSIONS

The cab shall be designed to satisfy the following minimum width and length dimensions:

- Cab Width (excluding mirrors) 98"
- Cab Length (from C/L of front axle)
    - To front of cab (excluding bumper) 68"
    - To rear of cab 73"
- Total Cab Length (excluding bumper) 141"

FENDER CROWNS

Polished stainless steel front axle fenderettes with full depth radiused wheel well liners shall be provided.

GRILLE

The front of the cab shall be equipped with a stainless steel grille with sufficient area to allow proper airflow into the cooling system and engine compartment.

CAB INSULATION

The cab shall be insulated in a manner to reduce noise levels inside the cab.
The cab interior sound levels shall not exceed 90 decibels at 45 mph in all cab seat positions.

ROOF DESIGN

The cab shall be of a 10" one-half rear raised roof design with side drip rails and shall satisfy the following minimum height dimensions:

- Cab Dimensions Interior
  - Front 59"
  - Rear 65"

- Cab Dimensions Exterior
  - Front 65"
  - Rear 75"

DIAMOND PLATE, CAB ROOF

The roof of the cab shall have a diamond plate overlay. The overlay shall be constructed of minimum .125" aluminum serrated diamond plate and measure approximately 30" x 60".

DOORS

The cab doorframes shall be constructed from aluminum extrusions fitted with an aluminum sheet metal skin and shall be equipped with dual weather seals. The outside cab door window opening shall be framed by a black anodized aluminum trim, to provide a clean appearance. The cab doors shall be equipped with heavy-duty door latching hardware, which complies with FMVSS 206. The mechanics of the door operation shall utilize rod linkage for positive operation. A rubber coated nylon web doorstop shall be provided.

The doors shall be lap type with a full-length stainless steel 3/8" diameter hinge and shall be fully adjustable.

All openings in the cab shall be grommeted or equipped with rubber boots to seal the cab from extraneous noise and moisture.

The cab doors shall be designed to satisfy the following minimum opening and step area dimensions:

- Door Opening:
  - Front 36.5" x 73.00"
  - Rear 36.5" x 73.00"

EXTERIOR GLASS

The cab windshield shall be of a two-piece curved design utilizing tinted, laminated, automotive approved safety glass. The window shall be held in place by an extruded rubber molding. The cab shall be finished painted prior to the window installation.

SUN VISORS

The sun visors shall be made of dark smoke colored transparent polycarbonate. There shall be a visor located at both the driver and officer positions recessed in a molded form for a flush finish.

CAB STEPS

The lower cab steps shall be no more than 22" from the ground. An intermediate step shall be provided, mid-way between the lower cab step, and the cab floor.

The intermediate step shall be slightly inset to provide for safer ingress and egress. All steps shall be covered with material that meets or exceeds the NFPA requirements for stepping surfaces.

STEP LIGHTS

A white LED strip light shall illuminate each interior cab step. These lights shall illuminate whenever the battery switch is on and the cab door is opened.

CAB STRUCTURAL INTEGRITY

The cab of the apparatus shall be designed and so attached to the vehicle as to eliminate, to the greatest possible extent, the risk of injury to the occupants in the event of an accident.

The brand of apparatus cab being supplied shall be tested to specific load and impact tests with regard to the protection of occupants of a commercial vehicle.

One test shall be conducted on the brand of cab being supplied to evaluate the frontal impact strength of the apparatus cab to conform to the test J2420 and the United Nations Regulation 29, Annex 3, paragraph 4, (Test A).

A second test shall be conducted to evaluate the roof strength of the brand of apparatus cab being supplied to conform to the Society of Automotive Engineers (SAE) SAE J2422/SAE J2420 and United Nations Regulation 29, Annex 3, paragraph 5, (Test B) and SAE J2420. The evaluation shall consist of the requirements imposed by ECE Regulation 29, Paragraph 5.

A certified independent third-party testing institution shall conduct the tests.

A letter stating successful completion of the above tests on the brand of cab being supplied shall be included in the bid.

SEAT BELT TESTING

The seat belt anchorage system shall be tested to meet FMVSS 207 Section 4.2a and FMVSS 210 section 4.2. Testing shall be conducted by an independent third party product evaluation company.

A copy of the certification letter shall be supplied with the bid documents.

MANUAL CAB LIFT

There shall be a manually operated hydraulic pump for tilting the cab in case the main pump should fail. Access to the pump shall be located under the left corner of the front bumper.

POWER WINDOWS

All four cab entry doors shall have power windows. Each door shall be individually operated and the driver’s position shall have master control over all windows. All four windows shall roll down completely.

REAR CAB WINDOWS

Two sliding windows approximately 16.25" wide x 14.25" high shall be provided as an option in the back wall of the cab.

WINDOW TINTING

The crew cab windows and doors, with the exception of the driver's and officer's doors, and the windshield, shall be tinted with deep "limo" tint.

WORK SURFACE

There shall be a flat work surface in front of the officer's seat.

CENTER CONSOLE

There shall be a console mounted on the engine hood between the driver and officer. The console shall be covered in black vinyl material to match the engine hood.

The console shall come complete with two drink holders, and recessed wells for storage of gloves or other miscellaneous items.

The outboard sections shall contain duct work to direct air flow from the heater/AC towards the driver and officer.

REFLECTIVE MATERIAL

The lower portion of the door panels shall include a minimum of 245 square inches of reflective material on each door, exceeding the NFPA requirement of 96 square inches. The layout shall be opposing ruby red "chevron" stripes on each side. The red striping shall be laid over white 3M reflective materials. The reflective decal shall be plainly visible to oncoming traffic when the doors are in the open position.

CAB ACCESSORY FUSE PANEL

A fuse panel shall be located underneath the rear facing seat on the officer's side. The fuse panel shall consist of six (6) battery hot and six (6) ignition switch circuits. Each circuit shall be capable of 10-ampere 12-volt power and total output of 50-amps. The fuse panel shall be capable of powering accessories such as hand held spotlights, radio chargers, hand lantern chargers and other miscellaneous 12-volt electrical components.

CAB COMPARTMENT

The rear of the cab shall have an approximate 12" wide transverse compartment accessible by hinged doors on both sides of the apparatus. This compartment shall contain a bi-directional slide-out tray above the frame rails with the ability to mount axes, halligans, and pike poles. This tray shall slide out approximately 75% of its depth. The compartment space below the top of the frame rail shall be as deep as possible and contain one adjustable shelf on each side.

EMS CABINET

There shall be a cabinet constructed of .125 aluminum plate and painted to match the interior of the cab. The cabinet dimensions shall be approximately 45" wide x 18" deep x 65" tall. The cabinet shall come complete with a locking roll up door and one adjustable shelf. Strip lighting shall be provided in the cabinet. The location of the cabinet shall be centered on the back cab wall. A 12-volt power supply that is battery hot shall be provided in the cabinet.

The cabinet shall be placed on an approximate 6" riser.

AIR HORNS

Two (2) Grover 2040 Stuttertone rectangular, chrome plated, air horns shall be recess mounted, one (1) each side behind the perforated grille of the bumper.

The air horns shall be controlled by a toggle switch wired through the horn button. A foot switch for the air horns shall also be provided on the officer's side.

ALTERNATOR / LOW VOLTAGE ALARM

A 320 ampere Prestolite/Leece Neville alternator with serpentine belt shall be provided. The alternator shall generate 260 amperes at idle.

A low voltage alarm, audible and visual, shall be provided.

FRONT AXLE

A Meritor MFS-20-133A 3.74”drop beam with a capacity of 23,000 pounds shall be provided. The axle shall be hub piloted, 10 stud, furnished with oil seals and come complete with assist cylinder, hoses, and mounting brackets.

REAR AXLE

A Meritor RS-30-185 Single reduction drive axle with a capacity of 31,000 lbs. shall be provided. The axle shall be hub piloted, 10 studs, and furnished with oil seals.

TOP SPEED

Rear axle speed shall be approximately 60 MPH.

HUBOMETER

A Hubometer shall be attached to the rear axle for actual road mileage.

AUTOMATIC TIRE CHAIN SYSTEM

The apparatus shall be equipped with a Rudd brand 18-Strand Automatic Tire Chain System.

There shall be one driver's side and one passenger's side chain unit.

A continuous duty solenoid shall be provided and activated by a dashboard switch, which shall open and allow compressed air to flow to the chain units. Compressed air shall be delivered to the solenoid from the vehicle's air tank. The solenoid shall be mounted on the frame rail or crossmember in close proximity of the chain units. This air/electric solenoid shall be 12-volts and draw no more than 1 ampere of current. Electrical wire shall be in accordance with NFPA 1901.
A 12-volt dashboard switch shall be provided so that the operator may engage the chains from the driver's seat. The switch shall be lighted to indicate when the chains are engaged. The switch shall come complete with a switch guard to avoid accidental engagement of the automatic chains. The switch guard shall be properly labeled. A dashboard sticker with operating instructions shall be provided.

AUTOMATIC CHASSIS LUBRICATION

A Vogel Automatic Lubrication System shall be installed to provide automatic grease application, with recommended dosages, per system interval cycle, to the following lubrication wear points:

- Spring pins and spring hanger pins @ 0.6 CCM
- King pins, upper and lower @ 0.4 CCM
- Steering linkage @ 0.2 CCM
- Tie rod ends @ 0.2 CCM
- Brake S-cams @ 0.1 CCM (Meritor shall not warrant application to caliper slide pins)
- Steering assist cylinder (if applicable) @ 0.2 CCM
- Drag link @ 0.2 CCM
- Automatic slack adjusters @ 0.1 CCM

The lubrication system shall utilize the post lubrication principle and shall be powered by an electric drive, 12-volt gear pump. The rear pump shall be top mounted to a reservoir assembly with a minimum capacity of 2.716 lbs. grease liters. The electronic control unit shall be connected through the ignition circuit, which shall provide power to the pump when the engine is running.

The gear pump and reservoir shall be located in an accessible location.

The electronic control module shall include system monitoring capabilities for the main line and operating cycle with a visual indicator for the vehicle operator, located in the overhead console. The control module shall have LED's and a system reset button to initiate a lube cycle for diagnostic purposes and/or reset the control module in the event a system fault has occurred. Upon a fault, the system shall be inoperable until the fault has been corrected and the operator or serviceman has initiated a system reset.

BATTERIES

The battery system shall be a single system consisting of a minimum of four negative ground, 12 volt Interstate Group 31 MHD batteries, cranking performance of 950 CCA each with total of 3800 amps, minimum 185 minute reserve capacity with 25 ampere draw at 80 degrees Fahrenheit. Each battery shall have a minimum of 114 plates. Warranty shall be accepted nationwide.

The batteries shall be installed in a vented 304 stainless steel battery box with a

removable aluminum cover to protect the batteries from road dirt and moisture.

The battery cover shall be secured with four “T” handle rubber hold downs to provide easy access for maintenance and inspection. Stainless steel hardware shall be used for installation.

The batteries are to be placed on dri-deck and secured with a fiberglass hold down. The batteries shall be wired directly to the starter motor and alternator.

The battery cables shall be 3/0 gauge. Battery cable terminals shall be solder dipped, color coded and labeled on heat shrink tubing with a color coded rubber boot protecting the terminals from corrosion.

There shall be a 350-ampere fuse protecting the pump primer and a 250-ampere fuse protecting the electric cab tilt pump and other options as required.

BATTERY CHARGING

A Kussmaul Auto Charge 1200 battery system charger shall be provided. A single bar graph display shall be provided to indicate the state of charge of the battery system. The rated output shall be 40 amps for the vehicle battery system.

A Kussmaul Model 091-55-20-120 super electric auto-eject with yellow weatherproof cover and power interrupt shall be provided and installed near the driver’s door.

BATTERY JUMPER TERMINAL

There shall be one set (two studs) of battery jumper terminals located by the battery box under the cab. The terminals shall have plastic color-coded covers. Each terminal shall be tagged to indicate positive/negative.

BRAKES (Front)

The front brakes shall be Meritor S-cam style, approximately 16.5" x 6" with heavy-duty return springs, and a double anchor pin design and have quick-change shoes for fast easy brake relining.

BRAKES (Rear)

The rear brakes shall be Meritor S-cam style, approximately 16.5" x 7" with heavy-duty return springs, and a double anchor pin design and have quick-change shoes

for fast easy brake relining.

BRAKE WARRANTY

The brakes shall carry Meritor's two (2) year unlimited mile warranty, exclusive of wear items.

AIR BRAKE SYSTEM

The vehicle shall be equipped with air-operated brakes. The system shall meet or exceed the design and performance requirements of current FMVSS-121 and test requirements of current NFPA 1901 standards.

Each wheel shall have a separate brake chamber. A dual treadle valve shall split the braking power between the front and rear systems.

All main brake lines shall be color-coded nylon type, protected in high temperature rated split plastic loom. The brake hoses from frame to axle shall have spring guards on both ends to prevent wear and crimping as they move with the suspension. All fittings for brake system plumbing shall be brass.

A Meritor Wabco System Saver 1200 air dryer shall be provided.

The air system shall be provided with a rapid build-up feature, designed to meet current NFPA 1901 requirements. The system shall be designed so the vehicle can be moved within 60 seconds of startup. The quick build up system shall provide sufficient air pressure so that the apparatus has no brake drag and is able to stop under the intended operating conditions following the 60-second buildup time. The vehicle shall not be required to have a separate on-board electrical air compressor or shoreline hookup to meet this requirement.

Four (4) supply tanks shall be provided. One air reservoir shall serve as a wet tank and a minimum of one tank shall be supplied for each the front and rear axles. A Schrader fill valve shall be mounted in the front of the driver's step well.

A spring actuated air release emergency/parking brake shall be provided on the rear axle. One (1) parking brake control shall be provided and located on the engine hood next to the transmission shifter within easy reach of the driver. The parking brake shall automatically apply at 35 ±10 PSI reservoir pressure. A Meritor WABCO IR-2 Inversion Relay Valve, supplied by both the Primary and Secondary air systems, shall be used to activate the parking brake and to provide parking brake modulation in the event of a primary air system failure.

Accessories plumbed from the air system shall go through a pressure protection valve and to a manifold so that if accessories fail they shall not interfere with the air brake system.

AIR OUTLET

Two (2) air chucks shall be provided adjacent to the pump operator's panel, one on each side. The air system shall tie into the wet tank of the brake system and include an 85-psi pressure protection valve in the outlet line to prevent the brake system from losing all air. The hose type fitting shall be specified at pre-construction.

AIR BRAKING ABS SYSTEM

A Wabco ABS system shall be provided to improve vehicle stability and control by reducing wheel lock-up during braking. This braking system shall be fitted to axles and all electrical connections shall be environmentally sealed from water and weather and be vibration resistant.

The system shall constantly monitor wheel behavior during braking. Sensors on each wheel shall transmit wheel speed data to an electronic processor, which shall sense approaching wheel lock and instantly modulate brake pressure up to 5 times per second to prevent wheel lock-up. Each wheel shall be individually controlled. To improve field performance, the system shall be equipped with a dual circuit design. The system circuits shall be configured in a diagonal pattern. Should a malfunction occur, that circuit shall revert to normal braking action. A warning light at the driver's instrument panel shall indicate malfunction to the operator.

The system shall consist of a sensor clip, sensor, electronic control unit and solenoid control valve. The sensor clip shall hold the sensor in close proximity to the tooth wheel. An inductive sensor consisting of a permanent magnet with a round pole pin and coil shall produce an alternating current with a frequency proportional to wheel speed. The unit shall be sealed, corrosion-resistant and protected from electro-magnetic interference. The electronic control unit shall

monitor the speed of each wheel sensor and a microcomputer shall evaluate wheel slip in milliseconds.

AUTOMATIC SLIP RESPONSE

The Rockwell/Wabco 4 Channel Anti-lock braking system shall be provided. The system shall be supplied with Automatic slip response that controls slip under acceleration.

ACCELERATION SLIP RESISTANCE

An on/off switch for the Acceleration Slip Resistance shall be provided on the dash. This shall allow the driver to override the computer and turn the Acceleration Slip Resistance on when at a higher speed for better traction in deep snow or mud.

ELECTRONIC STABILITY CONTROL SYSTEM

An Arvin Meritor / Wabco Electronic Stability Control (ESC) system shall be provided and installed. The ESC system shall continually monitor the vertical acceleration, and yaw (horizontal plain rotation) of the vehicle, and compare it to a critical threshold where vehicle rollover may occur. When the critical threshold is met, the ESC shall intervene by reducing engine torque and engaging the engine retarder, while automatically applying both the steering and drive axle brakes as needed.

BUMPER

There shall be a minimum 12" high double rib polished stainless steel wrap-around bumper provided at the front of the apparatus. Laser cut perforated grilles shall be incorporated into the bumper and located at the outboard of the frame rails for the air horns and at the center for the siren speaker. The bumper shall be mounted to a reinforcement plate constructed of minimum 1/4" x 10" x 70" carbon steel. A gravel shield shall be provided, constructed of minimum .188 aluminum diamond plate. The bumper extension shall be approximately 24".

STORAGE WELL COMPARTMENT

There shall be a hose well compartment located in the center of the front bumper. The compartment shall run the full width of the bumper and measure approximately 75" wide x 16" long x 6" deep at the ends and 12" deep in the center. The compartment shall be constructed of .125" smooth aluminum plate.

DIAMOND PLATE BUMPER LID

There shall be a minimum 1/8 diamond plate cover with latches provided for the front bumper trough. The cover shall have a 2” rise to accommodate the storage well requirements.

BELL

A chrome South Park brand 12” fire bell shall be provided and mounted on the right side of the apparatus bumper. A “T” handle and pull cable shall be provided to actuate the bell. The handle shall be located below the dash in front of the officer position.

BELL INTERLOCK

The bell shall be installed on a moveable mount with an interlock feature. This feature shall prevent the cab from being tilted without the bell being moved.

COOLING SYSTEM AND RELATED COMPONENTS

The cooling system shall be designed to keep the engine properly cooled under all conditions of road and pumping operations. The cooling system shall be designed and tested to meet or exceed the engine and transmission manufacturer’s requirements, and EPA regulations.

The complete cooling system shall be mounted in a manner to isolate the system from vibration and stress. The individual cores shall be mounted in a manner to allow expansion and contraction at various rates without inducing stress to the adjoining core(s).

The cooling system shall be comprised of a charge air cooler to radiator serial flow package that provides the maximum cooling capacity for the specified engine as well as serviceability. The main components shall include a surge tank, a charge air cooler, bolted to the top of the radiator to maximize cooling, recirculation shields, a shroud, a fan, and required tubing. All components shall consist of an individually sealed system.

RADIATOR

The radiator shall be a cross-flow design constructed completely of aluminum with welded side tanks. The radiator shall be bolted to the bottom of the charge

air cooler to allow a single depth core, thus allowing a more efficient and serviceable cooling system.

The radiator shall be equipped with a drain cock to drain the coolant for serviceability. The drain cock shall be located at the lowest point of the aluminum cooling system to maximize draining of the system.

CHARGE AIR COOLER

The charge air cooler shall be of a cross-flow design and be constructed completely of aluminum with extruded tanks. The charge air cooler shall be bolted to the top of the radiator to allow a single depth core.

COOLANT

The cooling system shall be filled with a 50/50 mix. The coolant makeup shall contain ethylene glycol and de-ionized water to prevent the coolant from freezing to a temperature of –34 degrees F.

HOSES & CLAMPS

Silicone hoses shall be provided for all engine coolant lines.

All radiator hose clamps shall be spring loaded stainless steel constant torque hose clamps for all main hose connections to prevent leaks. Recirculation shields shall be installed where required to prevent heated air from reentering the cooling package and affecting performance.

FAN

The engine cooling system shall incorporate a heavy-duty composite 11- blade Z-series fan. It shall provide the highest cooling efficiently while producing the lowest amount of noise.

A shroud and recirculation shield system shall be used to ensure air that has passed through the radiator is not drawn through again.

The fan tip to radiator core clearance shall be kept at a minimal distance to increase the efficiency of the fan and reduce fan blast noise.

FAN CLUTCH

A fan clutch shall be provided that shall allow the cooling fan to operate only when needed. The fan shall remain continuously activated when the truck is placed in pump gear.

SURGE TANK

The cooling system shall be equipped with an aluminum surge tank mounted to the Officer's side of the cooling system core. The surge tank shall house a low coolant probe and sight glass to monitor the coolant level. Low coolant shall be alarmed with the check engine light. The surge tank shall be equipped with a dual seal cap that meets the engine manufacturer's pressure requirements, and system design requirements.

The tank shall allow for expansion and to remove entrained air from the system. There shall also be an extended fill neck to prevent system overfill and encroachment of expansion air space. Baffling shall be installed in the tank to prevent agitated coolant from being drawn into the engine cooling system.

DRIVELINE

The driveline shall consist of Spicer 1810 series, or equal, dual grease fitting universal joints with "Half-Round" end yokes. The drive shaft shall be built with a heavy-duty steel tube minimum 4.095" outside diameter x minimum .180" wall thickness. The shafts shall be dynamically balanced prior to installation into the chassis. A splined slip joint shall be provided in each shaft assembly. Universal joints shall be extended life. There shall be two (2) Zerk fittings in each universal joint assembly so the joint can be greased without turning the shaft.

ENGINE ENCLOSURE

An integral, formed aluminum and composite engine enclosure shall be provided. The engine enclosure shall be of a contoured design to blend in an aesthetically pleasing manner with the interior dash and flooring of the cab. The enclosure shall be kept as low as possible to maximize space and increase crew comfort.

The enclosure shall be constructed from 5052 H2 aluminum plate and GRP composite materials, providing high strength, low weight, and superior heat and sound deadening qualities. The exterior sides shall be covered with rubberized carpeting to aid in sound deadening and heat resistance. The top shall be

covered with a fiberglass grade cover, with a heavy duty, molded black vinyl, wear resistant covering, further reducing noise and heat in the cab.

The underside of the engine enclosure shall be covered with a sound deadening, heat reflective insulation system, and shall further minimize noise (DB levels), and eliminate engine heat from the front and rear of the cab. The insulation material shall be bonded with adhesive and mechanically fastened to the underside of the cab. All seams shall be sealed to prevent water absorption.

The engine enclosure shall have access doors that shall permit daily fluid checks from within the cab interior, without requiring the cab to be tilted.

A work light shall be installed in the engine enclosure with an individual switch located on the base of the light.

ENGINE

The apparatus shall be powered by a Cummins Diesel ISX 12 500 HP @ 1800 R.P.M., 1645 ft. lb. torque @ 1100 R.P.M.

ENGINE WARRANTY

The engine shall have a five year or 100,000 mile warranty and approval by Cummins for installation in the chassis. There shall be no deductible for the first two years. A one hundred dollar deductible shall apply for service during the next three years.

AIR COMPRESSOR

The air compressor shall be an 18.7 CFM engine driven Wabco.

STARTER

A 12-volt starter shall be provided, controlled by a switch on the left lower cab dash.

FUEL FILTERS

The engine fuel filters shall be mounted in a manner that is easily accessible for service or replacement. A Cummins approved primary FleetGuard Fuel Pro filter shall be remote mounted to the Chassis frame rail. A secondary FleetGuard FF2200 spin on filter shall be mounted on the engine.

EXHAUST SYSTEM

The engine exhaust system shall include the following components:

- Diesel Particulate Filter (DPF)
- Diesel Oxidation Catalyst (DOC)
- Diesel Exhaust Fluid (DEF)
- Selective Catalytic Reduction Filter (SCR)

The SCR catalyst shall utilize the DEF fluid, which shall consist of urea and purified water, to convert NOx into nitrogen and water. This shall meet or exceed 2013 EPA emissions requirements.

The engine exhaust system shall be of a horizontal design constructed from heavy-duty truck components. The exhaust tubing shall be stainless steel to the DPF through to the SCR, aluminized steel from the SCR to the exhaust tip. A heavy duty stainless steel bellows tube shall be used to isolate the exhaust system from the engine. The system shall be equipped with single canister consisting of a Diesel Oxidation Catalyst (DOC) and a Diesel Particulate Filter (DPF), and shall be mounted under the right side frame rail, meeting the specific engine manufacturer's specifications and current emission level requirements. The outlet shall be directed to the forward side of the rear wheels, exiting the right side with a heavy duty heat diffuser. The heat diffuser shall prevent the exhaust temperature from exceeding 851 deg. F during a regeneration cycle. A heat-absorbing sleeve shall be provided on the exhaust pipe in the engine compartment area to reduce the heat, protect the alternator, and also to protect personnel while servicing the engine compartment.

AFTER TREATMENT SYSTEM

To meet EPA requirements of Particulate output, a DPF (Diesel Particulate Filter) is to be used. To meet EPA requirements of Nitrous Oxide output an SCR (Selective Catalytic Reduction) system utilizing DEF (Diesel Exhaust Fluid) is to be used.

ON-BOARD DIAGNOSTIC (OBD) SYSTEM

The engine shall be equipped with an on-board diagnostic (OBD) system which shall monitor emissions-related engine systems and components and alert the operator of any malfunctions. The OBD system shall be designed to further enhance the engine and operating system by providing early detection of mission-related faults.

The engine control unit (ECU) shall manage smart sensors located throughout the engine and after-treatment system. The system shall monitor component verification and sensor operation. There shall be warning lights located in the dash instrument panel to alert the operator of a malfunction. A data port shall be provided under the driver's side dash for the purpose of code reading and troubleshooting. All communication shall be provided through the J1939 data link.

AIR CLEANER/INTAKE

The engine air intake and filter shall be designed in accordance with the engine manufacturer's recommendations. It shall be 99.9% effective in removing airborne contaminants when tested per the industry standard SAE J726 procedure and offer a dirt holding capacity of at least 3.0 gm/cfm of fine dust (tested per SAE J726) offering superior engine protection.

The air filter shall be located at the front of the apparatus and shall be at least 66" above the ground, to allow fording deep water in an emergency situation.

An ember separator shall be provided in the engine air intake to meet the requirements of NFPA 1901.
An Air Restriction warning light shall be provided and located on the cab dash.

ENGINE BRAKE

The engine shall be equipped with a Jacobs compression engine brake. An "On/Off" switch and a control for "Low/High" shall be provided on the instrument panel within easy reach of the driver.

The engine brake shall interface with the Wabco ABS brake controller to prevent engine brake operations during adverse braking conditions.

A pump shift interlock circuit shall be provided to prevent the engine brake from activating during pumping operations.

The brake light shall activate when the engine brake is engaged.

DIESEL EXHAUST FLUID TANK

The exhaust system shall include a molded cross linked polyethylene tank. The tank shall have a capacity of 5 usable gallons and shall be mounted on the left side of the chassis frame.

The DEF tank fill neck shall accept only a 19mm dispensing nozzle versus the standard 22mm diesel fuel dispensing nozzle to prevent contamination. The DEF tank cap shall be blue in color to further prevent cross contamination.

A placard shall accompany the fill location noting DEF specifications.

EXHAUST ADAPTER

The exhaust shall terminate to accept a station mounted PlymoVent® exhaust system.

FRAME

The chassis frame shall be of a ladder type design utilizing industry accepted engineering best practices. The frame shall be specifically designed for fire apparatus use. Each frame rail shall be constructed of two 3/8" thick-formed channels. The outer channel shall be 10.06" x 3.50” x .375” and the inner channel (liner) shall be 9.31” x 3.13” x .375”. The section modulus shall be 31.28 in.3. The resistance to bending moment (RBM) shall be 1,569,160 in./lbs.

The cross-members shall be constructed of minimum 3/8" formed channels and have formed gusseted ends at the frame rail attachment.

.625 inch, grade 8 flange, Huck bolt fasteners or equivalent shall be used on all permanently attached brackets to the frame to eliminate the need for bolt re-tightening.

A lifetime warranty shall be provided, per manufacturer's written statement.

FUEL TANK

The chassis shall be equipped with a 65-gallon stainless steel rectangular fuel tank.

The fuel tank shall be certified to meet FMVSS 393.67 tests. It shall also maintain engine manufacturer's recommended expansion room of 5%.

The tank shall be removable by means of six (6) bolted connections and dropped. One (1) tank baffle shall be used.

The fuel tank shall be equipped with a minimum 2 1/4" filler neck assembly with a 3/4" vent located on the left hand side of the tank. A fuel fill cap attached with a lanyard shall be provided. The bottom of the fuel tank shall contain a 1/2" drain plug.

The fuel lines shall be nylon braid reinforced fuel hose with brass fittings. The lines shall be carefully routed along the inside of the frame rails. All fuel lines shall be covered in high temperature rated split plastic loom. Single suction and return fuel lines shall be provided.

The fuel tank shall be mounted in a saddle with a barrier between the tank and the saddle.

FUEL COOLER

Installed on the apparatus fuel system shall be an Air-To-Liquid aluminum fuel cooler. The fuel cooler shall be located in the lowest module of the cooling system.

CAB HANDRAILS

There shall be a 24" long, handrail provided and installed, at each cab entrance.

The handrails shall be constructed of type 304 stainless steel 1.25 inch diameter tubing with bright finish and knurled gripping surface. Mounting flanges shall be constructed from 7 gauge, .180 thick, stainless sheet. Each grab rail shall have 90 degree returns to flanges. The ends of grab rail shall pass through the flanges and be welded to form one structural unit. The handrails shall be mounted using 1.25" SS Hex bolts, with a barrier rubber gasket at each flange.

Sufficient space shall allow for a gloved hand to firmly grip the rail.

There shall be two (2) rubber coated grab handles provided and mounted on the interior of the cab, one each side, on the windshield post for ingress assistance.

The handrail on the driver's side shall be approximately 11" long and the handrail on the officer's side shall be approximately 18" long.

CAB DOOR HANDRAILS

Two (2) 1.25" diameter knurled stainless steel handrails shall be provided on the inside of the rear crew doors just above the windowsill.

HEATER/DEFROSTER/AIR CONDITIONER

There shall be a minimum 80,000 cool BTU and 75,000 heat BTU single unit, heater/air conditioner mounted over the engine cover. The unit shall be mounted in center of the cab on the engine hood/enclosure. Unit shall have a shutoff valve at the right side of the frame, next to the engine. Airflow of the heater/air conditioner shall be a minimum 1200 CFM. To achieve maximum cooling, a TM-31 Compressor (19.1 cu. in.) shall be used. There shall be ductwork to the floor of the cab, facing forward to provide heat for the front of cab floor area.

The defroster/heater shall be a minimum of 35,000 BTU and shall be a separate unit mounted over the windshield. There shall be eight (8) louvers/diffusers to direct to windshield and door glass. Airflow of the defroster/heater shall be a minimum 350 CFM. The unit shall be painted Zolatone greystone or equivalent to match the cab ceiling.

The condenser shall be roof mounted and have 80,000 BTU rating. The unit shall include two fan motors. Airflow of the condenser shall be a minimum 2250 CFM. The roof-mounted condenser shall work at full rated capacity at an idle with no engine heat problems.

HEATER/DEFROSTER/AIR CONDITIONING CONTROLS

The heater/defroster/air conditioning shall be located in the overhead console in the center of the apparatus cab within reach of the driver and officer. The controls shall be illuminated for easy locating in dark conditions. The controls shall be located in such a way that the driver shall not be forced to turn away from the road to make climate control adjustments. Control of all heater/defroster/air conditioning functions for the entire apparatus cab shall be achieved through these controls.

Metal deflectors shall be provided over the defroster and A/C vents.

DEFROSTER DIFFUSER

A molded diffuser made of durable ABS plastic ductwork system shall be provided. It shall be form fitted and shall attach to the cab's overhead defroster unit to provide temperature controlled air to the windshields. Air flow of up to 280 cfm is balanced and directed across the entire windshield for optimum defrosting capability in all types of weather.

LOAD MANAGER

A Load manager shall be provided and have the ability to sequence loads on and off. It shall also be able to shed 8 loads when the vehicle is stationary, starting at 12.7 volts lowest priority load to be shed, then respectively at 12.6, 12.4, 12.2, 12.0, 11.8, 11.4 and 11.0 volts DC.

Any load that has been shed shall be off for a minimum of five minutes, and then if voltage has rebounded above shed voltage, the shed load shall automatically come on.

There shall also be an indicator panel alongside the rocker switches, which indicate power is on, battery warning and fast idle. Battery warning indicator shall flash at a rate proportional to the voltage discharge rate.

AUTOMATIC HIGH IDLE ACTIVATION

The load management system shall be capable of activating the apparatus high idle system when the system voltage drops below 12.3 volts DC. The system shall raise engine speed for a minimum of five minutes until voltage exceeds 13.0 volt DC. The load management system shall activate the high idle feature before any devices are automatically shed OFF. The high idle function request from the load management device shall function only if the appropriate interlocks are present; that is, control of the high idle system is monitored and shall be superseded by the state of the interlock control module. The automatic high idle system shall be deactivated whenever the brake pedal is pressed, and shall remain inactive for two minutes thereafter to allow an operator to override the high idle function and return the engine to idle before PTO engagement.

INSTRUMENT PANEL

The main dash shroud, which covers the area directly in front of the driver from the doorpost to the engine hood, shall be custom molded and covered with a non-glare black vinyl. The dash shall be a one-piece hinged panel that tilts

outward for easy access to service the internal components. The gauge panel shall be constructed of durable aesthetically pleasing light gray polymer material, placed over a heavy duty steel backing plate, for added strength and durability.

The gauges shall be Beede Instruments, NexSys Link gauges or equivalent with built-in self-diagnostics and red warning lights to alert the driver of any problems. All gauges and controls shall be backlit for night vision and identified for function. All main gauges and warning lights shall be visible to the driver through the steering wheel.

MASTER BATTERY & IGNITION SWITCH

The vehicle shall be equipped with a keyless ignition, with a three (3)-position Master Battery rocker switch, "Off/ACC/On" and a two (2)-position Engine Start rocker switch, "Off/Start".

DIESEL PARTICULATE FILTER CONTROLS

There shall be two (2) controls for the diesel particulate filter. One control shall be for regeneration and one control shall be to inhibit engine regeneration. These shall be located below the steering wheel in the kick panel.

INSTRUMENTATION & CONTROLS

Instrumentation on dash panel:

- Tachometer/hourmeter with built in high exhaust system regeneration temperature, and instrument malfunction indicators
- Speedometer/odometer with built in turn signal, high beam and re-settable trip odometer
- Voltmeter
- Diesel fuel gauge
- DEF (Diesel Exhaust Fluid) gauge
- Engine oil pressure
- Transmission temperature
- Engine temperature
- Primary air pressure
- Secondary air pressure

Indicators and warning lights in front of the driver:

- Parking brake engaged
- Low air with buzzer
- Antilock brake warning
- Check transmission
- Transmission temperature
- Upper power indicator
- Seat belt
- Engine temperature
- Low oil indicator
- Low voltage indicator
- Air filter restriction light
- Low coolant indicator
- High idle indicator
- Power on indicator
- Check engine
- Stop engine
- Check engine MIL lamp
- DPF indicator
- High exhaust temperature
- Wait to start

Other indicator and warning lights (if applicable):

- Differential locked
- PTO (s) engaged
- Auto-slip response
- Retarder engaged
- Retarder temperature
- ESC indicator
- Jacks out
- Jacks down

Controls located on main dash panel:

- Master power disconnect with ignition switch
- Engine start switch
- Headlight switch
- Windshield wiper/washer switch

- Differential lock switch (if applicable)
- Dimmer switch for backlighting

Controls included in steering column:

- Horn button
- Turn signal switch
- Hi-beam low-beam switch
- 4-way flasher switch
- Tilt-telescopic steering wheel controls

CENTER CONTROL CONSOLE

There shall be an ergonomically designed center control console. The console shall be constructed of 1/8" smooth aluminum and shall be mounted on the engine hood between the driver and officer. The console shall have a durable coating to match the color of the engine hood covering and shall feature surfaces on each side that are contoured to face the driver and the officer for easy viewing and accessibility. The switches and other customer specified electrical items shall be mounted in removable 1/8" smooth aluminum panels with a black wrinkle finish. The console shall have an aluminum lift-up lid with quick release latch and be held in the open position with a gas strut to allow for easy access and serviceability.

Controls located in the console conveniently accessible to the driver:

- Transmission shifter
- Pump shift control with OK TO PUMP and PUMP ENGAGED lights
- Remote mirror control
- Illuminated rocker switches to control high idle, Jacob's brake, siren/horn, siren brake, master emergency, and other customer specified components

Controls located in the console conveniently accessible to the driver and the officer (center):

- Parking brake control with a guard to prevent accidental engagement

Controls located in the console conveniently accessible to the officer:

- Illuminated rocker switches to control customer specified components that are easily reachable to the officer and do not allow for compromise of the driver's view, and eliminate the need for foot switches
- Surface to recess siren head, radio head, or other desired items
- 12V power point

Driving compartment warning labels shall include:

- HEIGHT OF VEHICLE
- OCCUPANTS MUST BE SEATED AND BELTED WHEN APPARATUS IS IN MOTION
- DO NOT USE AUXILIARY BRAKING SYSTEMS ON WET OR SLIPPERY ROADS
- EXIT WARNINGS

Additional labels to be included:

- COMPUTER CODE SWITCH
- ABS CODE SWITCH
- FLUID DATA TAG
- CHASSIS DATA TAG

OVERHEAD CONTROL CONSOLE

An ergonomically designed overhead console shall be provided above the driver and officer, running the full width of the cab. The overhead console shall be constructed from 1/8" aluminum plate and shall be painted with a durable finish to match the inside of the cab. There shall be seven (7) removable 1/8" smooth aluminum plates with a black wrinkle finish to house switches and other electrical items.

Directly above the driver there shall be two (2) panels with no cutouts, unless otherwise specified by the customer.

There shall be a panel located to the right of the driver that shall be designated for defroster, heat, and air conditioning controls (if specified).
The center overhead panel shall be designated for up to seven (7) door ajar indicators.

Upon releasing the apparatus parking brake, one or more of these lights shall automatically illuminate (flash) when any of the following conditions occur that may cause damage if the apparatus is moved: cab or compartment door is open; ladder or equipment rack is not stowed; stabilizer system deployed; any other device has not been properly stowed. There shall be a panel to the left of the officer as well as two (2) directly above the officer. These panels shall have no cutouts, unless otherwise specified by the customer.

ENGINE WARNING SYSTEM

An engine warning system shall be provided to monitor engine conditions such as low oil pressure, high engine temperature and low coolant level. Warning indication shall include a STOP ENGINE (red) light with audible buzzer activation and a CHECK ENGINE (amber) light.

There shall be a master information light bar with 24 lights located across the center of the dash panel that covers up to 24 functions. These are defined under Indicators and Warning Lights above.

CHASSIS WIRING

All chassis wiring shall have XL high temperature crosslink insulation. All wiring shall be color-coded, and the function and number stamped at 3" intervals on each wire.

All wiring shall be covered with high temperature rated split loom for easy access to wires when trouble shooting. All electrical connectors and main connectors throughout the chassis shall be treated to prevent corrosion.

PUMP SHIFT MODULE

A pump shift module with indicating lights shall be located within easy reach of the driver. A gear lockup shall be provided to hold the transmission in direct drive for pump operation.

HIGH IDLE

The engine shall have a "high idle" switch on the dash that shall maintain an engine RPM of 1,000. The switch shall be installed at the cab instrument panel for activation/deactivation. The "high idle" mode shall become operational only when the parking brake is on and the truck transmission is in neutral.

DOOR AJAR LIGHT

A red strobe light, Model Ecco 6220, shall be installed in the center of the cab ceiling towards the front. The light shall be wired to all crew and body compartment doors on the apparatus. The light shall be wired to the spring brake system and shall illuminate when the spring brake is released and a door is open.

VEHICLE DATA RECORDER

An Akron / Weldon vehicle data recorder as required by the 2009 edition of NFPA 1901 shall be installed. Vehicle data shall be sampled at the rate of 1 second per 48 hours, and 1 minute per 100 engine hours.

Software shall be provided to allow the fire department to collect the data as needed.

INTERIOR

The cab interior shall have Zolatone gray/black rubberized, mar resistant, textured finish. The full front and rear headliners and rear firewall shall be finished in gray Durawear.

LIGHTING CAB EXTERIOR

Exterior lighting and reflectors shall meet or exceed Federal Motor Vehicle Safety Standards and National Fire Protection Association requirements in effect at this time.

ALTERNATING HEADLIGHTS

The headlights shall have an alternating flash feature for emergency response use.

LED HEADLIGHTS

There shall be dual sealed-beam LED rectangular headlights in custom housings on each side of the front of the cab. The lenses shall be hardened glass. The LEDs shall be long-lasting and able to withstand shock and vibration.
These headlights shall provide 850 effective lumens in high beam and 750 effective lumens in low beam. This installation shall be a 12V DC configuration and draw 3.6 Amps.

Headlight alignment shall conform to SAE J599 AUG. 1997

- DOT Approved FMVSS 108
- SAE J96 ECE Reg. 112
- Sealed to IP67

They shall have a 4-year limited Manufacturer's warranty.

DAYTIME RUNNING LIGHTS

The headlamps shall be provided with a "Daytime Running" feature. The lights shall automatically be switched on when the vehicle ignition is switched on.

LIGHTING CAB INTERIOR

Two (2) ceiling mounted combination red/clear LED dome lights with a push button on/off switch in the light lens shall be provided inside the cab. One light shall be located over each the officer and driver's position. The lights shall also activate from the open door switch located in each cab doorjamb.

LIGHTING CREW CAB INTERIOR

Two (2) ceiling mounted combination red/clear LED dome lights with a push button on/off switch in the light lens shall be provided inside the crew cab. The lights shall also activate from the open door switch located in each cab doorjamb.

MIRRORS

Two (2) Lang Mekra 300 Series smooth chrome plated Aero style main and convex mirrors shall be installed on each side of the vehicle. The main mirror shall be 4-way remote adjustable with heat, 7" x 16" 2nd surface chromed flat glass. The convex shall be 6" x 8" 2nd surface chromed 400 mm radius glass. Each mirror housing assembly shall be constructed of lightweight textured

chrome ABS with on truck glass and housing back cover replacement. In the event the mirror breaks the glass shall be replaceable in (3) minutes or less. The glass shall include a safety adhesive backing to keep broken glass in place. The mirror assembly shall be supported by a "C" loop bracket constructed of polished stainless steel tube utilizing two point mounting reducing vibration of mirror glass during normal vehicle operation. The lower section of the holder shall include a spring loaded single detent position 20 degrees forward with easy return to operating position without refocusing.

The primary mirrors shall be heated and remote controlled.

HELMET STORAGE

Three (3) OnScene Solutions “Talon” helmet Mounting Brackets shall be provided for helmet storing during transport.

The officer’s bracket shall be mounted on the engine enclosure in close proximity to the front passenger seat. The crew cab brackets shall be mounted to the ceiling structure above the two rear facing seats. Each bracket shall secure the helmet by encapsulating the brim on at least 3 points with constant tension. Each bracket shall meet the 9G load requirement and be adjustable for multiple helmet configurations.

Each mount shall be manufactured of anodized aluminum and stainless steel components with no elastic or expandable rope retention system.

A placard shall be provided for each riding position warning that injury may occur if helmets are worn while seated.

SEAT BELT WARNING SYSTEM

An Akron / Weldon seat belt warning system shall be provided, and shall monitor each seating position. Each seat shall be supplied with a sensor that, in conjunction with the display module located on the dash, shall determine when the seat belt was fastened and if the seat is occupied. An icon shall represent that the seat is properly occupied. An audible and visual alarm shall be activated if the seat is occupied and/or the belt is not fastened in the proper sequence.

DRIVER'S SEAT

The driver's seat shall be an H.O. Bostrom 8-way power electric seat. The seat shall have the following features:

- Integrated 3-point seat belts
- Power 8" fore /aft adjustment
- Power 2" height adjustment
- Power front seat tilt
- Power rear seat tilt
- Power Back recline
- Built in lumbar support
- 100% Durawear™ gray tweed seat material

OFFICER'S SEAT

The officer's seat shall be a Bostrom Firefighter™ Tanker 450 ABTS SCBA seat. The seat shall have the following features:

- Integrated 3-point seat belt
- "Auto-Pivot & Return" head rest
- Built in lumbar support
- 100% Durawear™ gray tweed seat material

UNDER SEAT STORAGE

There shall be a storage compartment under the officer's seat approximately 15" wide x 10.5" tall x 15.5" deep.

CREW SEATS

The crew cab area shall have two (2) rear facing Bostrom Tanker 450 ABTS SCBA seats. The seats shall have the following features:

- Integrated 3-point seat belts
- "Auto-Pivot & Return" head rest
- Built in lumbar support
- 100% Durawear™ gray tweed seat material or equivalent

FLIP UP SEATS

There shall be two (2) spring loaded flip-up seats on the body header at the jump seat area, one each side. Each seat shall be supplied with a 3-point seat belt.

SCBA BOTTLE BRACKET

The officer and rear facing crew seats shall come equipped with SmartDock® SCBA brackets.

The bracket system shall meet NFPA 1901 standards.

STEERING

The steering system shall be a TRW wheel to wheel steering system that is tested and certified by TRW, consisting of a heavy duty TRW/Ross Model TAS-85 power steering gear, TRW PS36 steering pump, miter box, drag links, and a thermostatic controlled fan cooled system (set point 185 deg. F to 170 deg. F). The steering gear shall be bolted to the frame at the cross-member for steering linkage rigidity. The steering shall require four (4) turns from lock to lock with an 18" diameter slip resistant rubber covered steering wheel. The steering column shall have six-position tilt and 2" telescopic adjustment. The cramp angle shall be 45 degrees with 315mm tires or 43 degrees with 425mm tires to provide a very tight turning ability.

SUSPENSION (FRONT)

The front suspension shall be a variable rate taper-leaf design, 54" long and 4" wide. Long life, maintenance free, urethane bushed spring shackles shall be utilized. All spring and suspension mounting shall be attached directly to frame with high strength Huck bolts and self-locking round collars. Spring shackles and pins that require grease shall not be acceptable.

ENHANCED FRONT SUSPENSION SYSTEM

The front suspension shall have the handling, stability, and ride quality enhanced by the use of a Ride Tech auxiliary spring system and Koni high performance shock absorbers.

The system shall utilize three stage, urethane auxiliary springs, and high performance gas filled shock absorbers to control the deflection of the leaf springs, and dampen vibration normally transmitted to the chassis. The system

shall be maintenance free and shall be custom tuned to the apparatus gross weight rating for maximum performance, while maintaining a soft compliant ride.

A (3) three year 36,000 mile warranty shall be provided by the manufacturer.

SUSPENSION (REAR) 31,000 LB AIR RIDE

A Hendrickson FIREMAAX model FMX312 air ride rear suspension shall be provided.

The suspension shall be a dual air spring design equipped with dual height control valves to maintain proper ride height. To reduce axle stress and maintain axle position and pinion angle the suspension design shall incorporate three torque rods. The ground rating of the suspension shall be 31,000 pounds.

WIRELESS TIRE PRESSURE MONITOR

A Doran 360HD wireless tire pressure monitoring system shall be provided and installed. The system shall consist of a cab mounted display that shall constantly monitor tire pressure, and a wireless sensor for each wheel. The display shall be mounted within clear view of the driver.

FRONT TIRES

Front tires shall be Michelin 425/65R22.5, load range L, XFE tread, single tubeless type with a GAWR of 22,000 pounds. Wheels shall be disc type, hub piloted, 22.5 x 12.25 10 stud 11.25 bolt circle. Chrome plated lug nut caps shall be provided.

FRONT HUB COVERS

Polished stainless steel hub covers shall be provided for the front axle.

REAR HUB COVERS

Polished stainless steel hub covers shall be provided for the rear axle.

REAR TIRES

Rear tires shall be Michelin 315/80R22.5, load range L, XZA-2 highway tread, dual tubeless type with a GAWR of 31,000 pounds. Wheels shall be disc type,

hub piloted, 22.5 x 9 10 stud with 11.25" bolt circle. Chrome plated lug nut caps shall be provided.

MUD FLAPS

Hard rubber mud flaps shall be provided for front and rear tires.

WHEELS

The front and rear wheels shall be ACCURIDE® brand aluminum. ACCU-SHIELD™ finish shall be provided on the front and outside-rear wheels.

TOW EYES (Front)

There shall be two front tow eyes with 3” diameter holes attached directly to the chassis frame.

TOW EYES (Rear)

There shall be two tow eyes attached directly to the chassis frame rail and shall be chromate acid etched for superior corrosion resistance and painted to match the chassis.

TRANSMISSION

The chassis shall be equipped with a Generation IV Allison EVS4000 six (6) speed automatic transmission. It shall be programmed five (5) speed, sixth gear locked out, for fire apparatus vocation, in concert with the specified engine.

An electronic oil level indicator shall be provided as well as a diagnostic reader port connection. The fifth gear shall be an overdrive ratio, permitting the vehicle to reach its top speed at the engine's governed speed. The dipstick handle shall have been dipped in a rubber coating for ease in checking oil level when hot.

The chassis to transmission wiring harness shall utilize Metri-Pack 280 connectors with triple lip silicone seals and clip-type positive seal connections to protect electrical connections from contamination without the use of coatings.

Ratings: Max Input (HP) 600
Max Input (Torque) 1850 (lb. ft.)
Max Turbine (Torque) 2600 (lb. ft.)

Mechanical Ratios: 1st - 3.51:1
2nd - 1.91:1
3rd - 1.43:1
4th - 1.00:1
5th - 0.74:1
Reverse - -5.00

TRANSMISSION COOLER

The apparatus transmission shall be equipped with a Liquid-To-Liquid remote mounted cooler with aluminum internal components. The cooler shall be encased in aluminum housing and mounted to the outside of the officer's side frame rail for accessibility and ease of service.

TRANSMISSION FLUID

The transmission shall come filled with Castrol TranSynd™ Synthetic Transmission Fluid or approved equivalent meeting the Allison TES-295 specification.

TRANSMISSION SHIFTER

An Allison "Touch Pad" shift selector shall be mounted to the right of the driver on the engine cover accessible to the driver. The shift position indicator shall be indirectly lit for nighttime operation.

FRONT TURN SIGNALS

There shall be two Whelen 400 Series LED rectangular amber turn signal lights mounted one each side in the front of the headlight housing and one mounted on each side of the warning light housing.

WHEELBASE

The approximate wheelbase shall be 221".

WINDSHIELD WIPERS

There shall be a two (2) black anodized finish two-speed synchronized electric windshield wiper system. Dual motors shall be provided with positive parking. The system shall include large dual arm wipers with built in washer system. One (1) master control shall work the wiper, washer and intermittent wipe features.

The washer bottle shall be remote fill with a 4-quart capacity and shall be located just inside of officer cab door.

MISCELLANEOUS CHASSIS EQUIPMENT

- Fluid capacity plate affixed below driver's seat.
- Chassis filter part number plate affixed below driver's seat.
- Maximum rated tire speed plaque near driver.
- Tire pressure label near each wheel location.
- Cab occupancy capacity label affixed next to transmission shifter.
- Do not wear helmet while riding plaque for each seating position.
- NFPA compliant seat belt and standing warning plates provided.

FIRE PUMP HALE QMAX-200

There shall be a Hale QMAX-2000 fire pump midship mounted. The fire pump shall be of the double suction single stage centrifugal type, carefully designed in accordance with good modern practice.

The pump shall be of fine grain alloy cast iron, with a minimum tensile strength of 30,000 PSI.

The pump body shall be horizontally split, on a single plane, casing type with removable lower casing for easy removal of the entire impeller assembly including wear rings and bearings from beneath the pump without disturbing piping or the mounting of the pump in the chassis.

All moving parts in contact with water shall be of high quality bronze or stainless steel. Easily replaceable bronze labyrinth wear rings shall be provided. Discharge passage shall be designed to accomplish uniform pressure readings as the actual pump pressure. The rated capacity of the fire pump shall be 2000 gallons per minute in accordance with NFPA# 1901.

The pump shaft shall be rigidly supported by three bearings for a minimum deflection. One high lead bronze sleeve bearing shall be located immediately adjacent to the impeller (on side opposite the drive unit). The sleeve bearing shall be lubricated by a force fed, automatic lubrication system, pressure balanced to exclude foreign material. The remaining bearings shall be heavy duty type, deep groove ball bearings and shall be splash lubricated.

The pump shaft shall have only one packing gland located on the inlet side of the pump. It shall be of split design for ease of repacking. The packing gland must be a full circle threaded design to exert uniform pressure on the packing to prevent "cocking" and uneven packing load when it is tightened. It shall be easily adjustable by hand with a rod or screw driver and requiring no special tools or wrenches. The packing rings shall be of a unique combination of braided graphite filament and braided synthetic packing and have sacrificial zinc foil separators to protect the pump shaft from galvanic corrosion.

PUMP TRANSFER CASE

The drive unit shall be designed of ample capacity for lubricating reserve and to maintain the proper operating temperature. The pump drive unit shall be of sufficient size to withstand up to 16,000 lbs. ft. torque of the engine in both road and pump operating conditions.

The gearbox drive shafts shall be heat treated chrome nickel steel input and output shafts shall be at least 2-3/4" in diameter, on both the input and output shafts. They shall withstand the full torque of the engine in both road and pump operating conditions.

The engagement of the pump transmission shall be of such design so as to permit transfer of power from road to pump operation only after vehicle is completely stopped.

The pump shift shall be air actuated from the cab and have both a green "Pump Engaged" light, and a green "O.K.-To-Pump" light. A third green light shall be provided on the pump operator's panel for "Throttle Ready".

The pump drive unit shall be cast and completely manufactured and tested at the pump manufacturer's factory.

PRIMING SYSTEM

The priming pump shall be a Trident Emergency Products compressed air powered, high efficiency, multi-stage, venturi based AirPrime System. All wetted metallic parts of the priming system are to be of brass and stainless steel construction. A single panel mounted control shall activate the priming pump and open the priming valve to the pump. The priming system shall have a five year warranty.

PUMP ANODE

A Hale pump anode kit assembly # 529-0050-00-0 shall be provided and installed in the pump body. A minimum of two (2) anodes shall be installed one (1) in the suction side and one (1) in the discharge side of the pump.

PUMP CERTIFICATION

The pump, when dry, shall be capable of taking suction and discharging water in compliance with NFPA #1901 chapter 14. The pump shall be tested by National Testing and shall deliver the percentages of rated capacities at pressures indicated below:

100% of rated capacity @ 150 PSI net pump pressure.
70% of rated capacity @ 200 PSI net pump pressure.
50% of rated capacity @ 250 PSI net pump pressure.

THREAD TERMINATION

National Standard Thread shall terminate the inlets and outlets of the apparatus.

PRESSURE GOVERNOR

The apparatus shall be equipped with a Class1 Pressure Governor that is connected to the Electronic Control Module (ECM) mounted on the engine. The Governor shall operate as a pressure sensor (regulating) governor (PSG) utilizing the engine's data for optimal resolution and response. Programmable presets for RPM and Pressure settings shall be easily configurable using a menu structure.

An audible alarm output shall be provided for the Engine RPM, system voltage, engine oil pressure and engine temperature.

THERMAL RELIEF VALVE

There shall be a Hale TRV Thermal Relief Valve supplied. The valve shall automatically dump a controlled amount of water to atmosphere when the pump water exceeds 120 degrees Fahrenheit. The valve shall reset automatically.

INTAKE RELIEF

There shall be a Hale stainless steel intake relief valve installed on the intake side of the pump that shall be field adjustable. The surplus water shall be discharged away from the pump operator and terminate with Male NST hose thread.

AUXILIARY COOLER

An auxiliary cooler shall be furnished to provide additional cooling to the engine under extreme pumping conditions. Water from the pump is to be piped to the coils of the heat exchanger allowing the engine fluid to be cooled as required.

VALVES

All valves shall be Akron Heavy-Duty swing out 8800/8600 series unless otherwise noted. The valve shall have an all cast brass body with flow optimizing stainless steel ball, and dual polymer seats. The valve shall be capable of dual directional flow while incorporating a self-locking ball feature using an automatic friction lock design and specially designed flow optimizing stainless steel ball. The valve shall not require the lubrication of seats or any other internal waterway parts, and be capable of swinging out of the waterway for maintenance by the removal of six bolts. The valve shall be compatible with a slow close device. This valve shall be actuated using manual handles, a Rack & Sector, manual gear, or electric actuator. The manual handles shall be quickly adjustable to one of eight handle positions, and require only 90 degrees travel.

VALVE WARRANTY

The valves shall carry a 10-year warranty.

QUARTER TURN DRAIN

The apparatus shall be equipped with Class1 Ball Valve Drains to allow draining for the pump and all water-carrying lines and accessories. All 2 1/2" or larger discharge outlets shall be equipped with a 3/4" ball valve drain or larger.

The drains shall have an all brass body with reinforced Teflon seals. The drains shall have NPT female inlets on both ends. The handles shall be chrome-plated zinc with a recessed area for 1" x 3" ID tags.

PUMP CONNECTIONS

All suction and discharge lines (except pump manifolds) 1" and larger shall be heavy-duty stainless steel pipe. Where vibration or chassis flexing may damage or loosen piping or where a coupling is necessary for servicing, a flexible connection shall be furnished. All lines shall be drained by a master drain valve or a separate drain provided at the connection. All individual drain lines for discharges shall be extended with a 90 degree fitting in order to drain below the chassis frame. All water carrying gauge lines shall utilize nylon tubing.

6” PUMP INLETS

Two 6" diameter suction ports with 6” NST male threads shall be provided, one on each side of vehicle. The inlets shall extend through the side pump panels and come with a removable strainer.

INTAKE VALVE

A Hale Master Intake valve shall be installed on the main pump inlet. It shall be electrically actuated from the pump panel and include a manual override hand wheel on the pump panel. The valve shall include a pressure relief valve to guard against incoming pressure surges.

2-1/2” LEFT SIDE INLET

One 2.5" gated inlet valve shall be provided on the left side pump panel. The valve shall be supplied with chrome plate female swivel, plug, chain, and removable strainer.

The valve shall attach directly to the suction side of the pump with the valve body behind the pump panel.

TANK TO PUMP

The booster tank shall be connected to the intake side of the pump with a 1/4 turn 3" full flow valve with check valve, with the remote control located at the operator's panel. The 3" tank to pump line shall run from a bottom sump into the 3" valve. To prevent damage due to chassis flexing or vibration, a short 3" flexible rubber hose coupling shall be used to connect the tank to the intake valve.

OUTLETS

The discharge valves shall be an inline Tork-Lock constructed of brass and be of the quarter turn type of fixed pivot design to allow for ease of operation at all pressures.

The valves shall be controlled from the operator's panel and shall be equipped with swing type locking handles. Each valve shall be supplied with 2-1/2" National Standard Threads and come with chrome plated female caps and chains. 2-1/2" or larger discharge outlet shall be supplied with a 3/4" quarter turn drain valve located at the outlet. All 2-1/2" and larger discharges shall be supplied with a 30 degree angle down elbow.

2-1/2" LEFT SIDE DISCHARGES

Two (2) 2-1/2" gated discharges shall be located on the left side pump panel. The valves shall be of the quarter turn tork-lok ball type of fixed pivot design to allow for ease of operation at all pressures. The valve shall be connected to the discharge side of the pump with the valve bodies behind the pump panel. A chrome swing type handle located on the pump operator's panel shall control the side discharges.

2-1/2" RIGHT SIDE DISCHARGE

One (1) 2-1/2" gated discharge shall be located on the right side pump panel. The valve shall be of the quarter turn tork-lok ball type of fixed pivot design to allow for ease of operation at all pressures. The valve shall be connected to the discharge side of the pump with the valve bodies behind the pump panel. A chrome swing type handle located on the pump operator's panel shall control the right side discharges.

ADAPTER

There shall be a 4" NST swivel female x 5" Storz adapter with cap and chain on the right side 4" discharge.

4" OUTLET RIGHT SIDE DISCHARGE

An Akron 4" valve shall be provided on the right side pump panel. The valve shall have a manual controller at the pump operator's panel.

2-1/2" OUTLET LEFT REAR

There shall be a 2-1/2" gated outlet piped to the left rear, adjacent to the hose bed. The outlet shall be installed with proper clearance for spanner wrenches or adapters. Plumbing shall be 2-1/2" piping and a full flow 2-1/2" ball valve with the control at the pump operator's panel.

REAR DISCHARGE HOSE BED

The left rear discharge hose bed shall be on top of the left compartment and have a minimum capacity of 400 foot of 2.5” hose. A vinyl cover shall be provided for the hose bed.

2-1/2” RIGHT REAR OUTLET

There shall be a 2-1/2" gated outlet piped to the right rear, adjacent to the hose bed. The outlet shall be installed with proper clearance for spanner wrenches or adapters. Plumbing shall be 2-1/2" piping and a full flow 2-1/2" ball valve with the control at the pump operator's panel.

FRONT BUMPER DISCHARGE

A 1-1/2" discharge with 2" plumbing shall be provided at the front bumper. The valve shall be remote controlled at the pump panel.

CROSSLAYS

Two (2) crosslay hose beds shall be supplied. The piping and valves shall be 2", the swivel shall be 1-1/2". The valves shall be the "drop-out" style, push/pull controlled from the pump panel.

Each compartment shall hold a minimum of 200 ft. of 1-3/4" double jacket hose. Both beds shall be of the same dimension.

CROSSLAY COVER

A vinyl cover shall be provided to enclose the top and sides of the crosslays, capable of being secured at the top and sides.

TANK FILL

A 2" tank fill line shall be provided, using a quarter turn full flow ball valve controlled from the pump operator's panel.

FOAM SYSTEM

There shall be an Akron Model 3126 125 G.P.M. By-Pass Eductor installed in the bumper discharge for one foam tank. The system shall come complete with a combination instruction plate and a 0-1-2-3-6% metering valve, as well as all necessary valves and check valves to properly flush the system.

FOAM TANK

There shall be a minimum 30-gallon foam tank as part of the main booster tank. There shall be a 3" PVC fill tower and cap and a tank vent. There shall be a 1-1/2" flanged outlet and drain valve at the lowest point in the tank.

PUMP AND GAUGE PANELS

The pump panels shall be constructed of black vinyl covered aluminum for maximum protection against abrasion caused during normal use and shall be easily removable.

The gauge and control panels shall be two separate panels for ease of maintenance. The upper gauge panel shall be hinged with a full-length stainless steel hinge held closed with a 1/4-turn latch. There shall be one (1) hinged access door as large as possible located over the right side pump panel. This door shall have a full-length stainless steel hinge and a 1/4 turn latching mechanism.

VALVE CONTROLS

The pump controls and gauges shall be located at the left side of the apparatus and properly marked. The control panel shall be laid out in a user-friendly manner.

All valve controls shall have the corresponding discharge gauge located immediately adjacent to control handle to allow operator to view the discharge pressure without searching the panel.

ESCUTCHEON PLATES

The pump panel shall be equipped with color-coded removable escutcheon plates around the suction and discharge valves. The escutcheon plates shall be designed to allow easy access for valve repair without dismantling the pump panel.

COLOR CODING

Each discharge valve control, outlet, and corresponding line gauge shall be color-coded. The color-coding shall be:

#1 Discharge - Yellow
#2 Discharge – White
Right Rear Discharge – Navy Blue
Left Rear Discharge - Green
#1 Pre-Connect - Orange
#2 Pre-Connect - Red
Front Bumper Discharge - Turquoise
Large Diameter Discharge – Yellow with White Border
Left Rear Discharge - Olive
Right Rear Discharge – Light Blue
Inlets – Burgundy
Tank fill Lime Green
Tank to Pump - Burgundy

PUMP PANEL LIGHTS

The driver and passenger side pump panel controls and gauges shall each be illuminated by a minimum of two (2) LED lights installed under a stainless steel cover.

PUMP PANEL ILLUMINATION

One pump panel illumination light shall be activated when the pump is engaged.

PUMP PANEL GAUGES AND CONTROLS

The following gauges and controls shall be provided at the pump panel:

- Two (2) certified laboratory test gauge outlets.
- Pump primer control.
- Master drain control and additional drains as needed.
- Tank-fill and pump cooler valve controls.
- Tank to pump valve control.
- Pump capacity rating plate.
- All discharge controls.
- Two (2) master pump gauges.
- Gauges on all 1-1/2" and larger discharge lines.

AIR HORN BUTTON

A push button switch shall be provided on pump operator’s panel to activate the air horns.

AIR OUTLET

Two (2) air chucks shall be provided adjacent to the pump operator's panel, one on each side. The system shall tie into the wet tank of the brake system and include an 85-psi pressure protection valve in the outlet line to prevent the brake system from losing all air. A 25 ft. air hose shall be provided.

Note: Purchaser to specify type of hose fitting.

6” MASTER GAUGES

NoShok liquid filled pump pressure and vacuum gauges shall be provided. The gauges shall be 6" in diameter with white faces and black lettering. The gauges shall have a pressure range of 30"-0-400 psi.

2-1/2" PRESSURE GAUGES

NoShok liquid filled individual line pressure gauges shall be provided. The gauges shall be 2-1/2" in diameter with white faces and black lettering. The gauges shall have a pressure range of 0-400 psi.

WATER TANK LEVEL GAUGE

A Fire Research TankVision® model WL2000 water tank volume indicator kit shall be installed. The kit shall include an electronic indicator module, a pressure sensor, and sensor cable. The indicator shall show the volume of water in the tank on nine (9) easy to see super bright LEDs. A wide view lens over the LEDs shall provide for a viewing angle of 180 degrees. The indicator case shall be waterproof and manufactured of aluminum.

The program features shall be accessed from the front of the indicator module. The program shall support self-diagnostics capabilities, self-calibration, and a datalink to connect remote indicators. Low water warnings shall include flashing LEDs at 25%, down chasing LEDs when the tank is almost empty.

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

The gauge shall be located on the pump operator's panel.

FOAM TANK GAUGE

A Fire Research TankVision® model WL2700 foam tank volume indicator kit shall be installed. The kit shall include an electronic indicator module, a pressure sensor, and sensor cable. The indicator shall show the volume of foam in the tank on nine (9) easy to see super bright LEDs. A wide view lens over the LEDs shall provide for a viewing angle of 180 degrees. The indicator case shall be waterproof and manufactured of aluminum.

The program features shall be accessed from the front of the indicator module. The program shall support self-diagnostics capabilities, self-calibration, and a datalink to connect remote indicators. Low water warnings shall include flashing LEDs at 25%, down chasing LEDs when the tank is almost empty.

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

The gauge shall be located on the pump operator's panel.

BODY SUBFRAME

A stainless steel subframe/undercarriage shall be provided for the body compartments.

APPARATUS BODY

The apparatus body shall be constructed of #4 brushed finish #304 stainless steel and shall include brushed stainless steel compartment interiors. Other scuff prone areas such as the area surrounding compartment openings, the rear inside beavertails, rear compartment door area and front and rear of the side compartments shall also be a brushed scuff resistant stainless steel finish.

The apparatus body, including the running boards shall be supported by structural channel and angle. The rear design shall be strong enough to support the complete body.

Each compartment shall be properly vented with louvers, have drain holes for the release of moisture, and have sweep-out flooring with no obstructions at the floor bottom.

BACKBOARD COMPARTMENT

A backboard compartment shall be fabricated of minimum .125" aluminum plate and mounted on the rear exterior wall of the cab. The backboard shall be accessible from the passenger side exterior. The backboard compartment shall be fabricated to also store two (2) 6’ D-handle Duo-Safety heavy-duty fiberglass pike poles.

REAR STEP COMPARTMENTATION

There shall be one compartment at the rear step, sealed and self-vented for the storage of gasoline powered equipment, approximately 30" high x 40" deep with a clear unobstructed opening approximately 42.5” wide x 23.25” high with hinged doors. This compartment shall not share venting with any other compartment.

COMPARTMENTATION LEFT SIDE

L-1 There shall be one compartment ahead of the rear wheels approximately 30" wide x 60" high x 19" deep with a clear unobstructed opening approximately 23” wide x 53.25” high with a hinged door.

L-2 There shall be one compartment above the wheel well approximately 60" wide x 30" high x 19" deep with a clear unobstructed opening approximately 50” wide x 25” high with a hinged lift-up door held open by gas springs.

L-3 There shall be a compartment behind the rear wheels approximately 25" wide x 60" high x 19" deep with a clear unobstructed opening approximately 18” wide x 53.25” high a with hinged door.

L-4 There shall be a second compartment behind the rear wheels approximately 50" wide x 60" high x 19" deep with a clear unobstructed opening approximately 41” wide x 53.25” high with hinged doors.

This compartment shall have a transverse opening to the rear compartment.

COMPARTMENTATION RIGHT SIDE

R-1 There shall be a compartment ahead of the rear wheels approximately 30" wide x 30" high x 24" deep with a clear unobstructed opening approximately 23” wide x 23.25” high with a hinged door.

R-2 There shall be a compartment behind the rear wheels approximately 25" wide x 30" high x 24" deep with a clear unobstructed opening approximately 18”wide x 23.25” high with a hinged door.

R-3 The shall be a second compartment behind the rear wheels approximately 50" wide x 30" high x 24" deep with a clear unobstructed opening approximately 41”wide x 23.25” high with hinged doors.
This compartment shall have a transverse opening to the rear compartment.

COMPARTMENT DOORS

The compartment doors shall be stainless steel and approximately 2" thick and consist of a D-ring, a double weatherproof seal and shall be arranged with double latches. Each door shall be vented to prevent condensation within the compartment door walls. The latches shall be the rotary type for secure holding and located at the top and bottom of the doors. The door pan on the back shall be closed and the latches shall be so designed that they can be removed through the D-ring opening.

The compartment to the right of the pump panel shall have a right hinged door, all other compartment doors shall be left hinged.

A door open indicator light shall be provided in the cab.

SCBA CYLINDER COMPARTMENTS

There shall be six (6) spare breathing air cylinder compartments recessed in the rear fender wells, two (2) left and four (4) right. The compartments shall have brushed stainless steel doors and equipped with a weather resistant flush fitting thumb latch. The interior of the door shall incorporate a rubber seal to keep the compartment free of road debris and moisture. The interior compartment shall be constructed of a high-density polyethylene plastic.

DRI-DEK MATTING

Dri-Dek brand matting shall be provided on the bottom of each compartment.

ADJUSTABLE SHELVES

There shall be two (2) adjustable shelves provided and installed in compartment L1 and R1. The shelves shall be fabricated of minimum .188" aluminum plate and have a formed lip that measures a minimum of 2".

PERFORATED ALUMINUM TOOL MOUNTING PLATE

A 3/16" perforated aluminum plate “peg board” shall be provided on the back and side walls of the upper half of compartment L1 for mounting tools.

ADJUSTABLE SHELF

There shall be two (2) adjustable shelves provided and installed in L4. The shelves shall be fabricated of .188" aluminum plate and have a formed lip that measures a minimum of 2".

ADJUSTABLE VERTICAL SLIDE-OUT PANEL

There shall be two (2) adjustable vertical slide-out tool peg boards with a 250 lb. capacity shall be supplied and mounted on unistrut tracks in compartment L3. Extra compartment lights shall be provided and located as needed to properly illuminate the compartment.

PERFORATED ALUMINUM TOOL MOUNTING PLATE

A 3/16" perforated aluminum plate “peg board” shall be provided on the right wall of compartment L3 for mounting tools.

1000# SLIDE-MASTER TRAY REAR

There shall be a Slide-Master pullout drawer provided and installed. The drawer shall have a distributed load capacity of 1,000 lbs. and be capable of extending 70% of its depth. The tray shall be fabricated of .188" aluminum plate with a 2" perimeter lip and be installed at floor level in the rear compartment. In addition, the tray shall have a single 3-sided .188" aluminum plate that extends as high as possible in the rear of the tray and slopes toward the front on each side to approximately 75% of the trays depth.

ADJUSTABLE SHELF

There shall be a 3/16" adjustable shelf provided and installed approximately 5.5" above the compartment floor in L2.

ADJUSTABLE ROLLOUT DRAWER

There shall be a minimum 250 lb. capacity rollout drawer supplied and installed at floor level in compartment R3. The drawers shall be approximately 2" deep and shall be mounted on adjustable tracks. In addition, the tray shall have a single 3-sided .188" aluminum plate that extends as high as possible in the rear of the tray and slopes toward the front on each side to 100% of the trays depth.

UNISTRUT

Each compartment shall come equipped with 1.625" x .875" x .125" aluminum Unistrut channel. The Unistrut shall be securely fastened to the interior walls of the compartment.

HOSE BED

The rear hose bed shall be divided into three (3) separate sections. Each hose bed section shall be completely wide open to allow for quick and easy loading and unloading of hose. The hose bed flooring shall be slatted extruded aluminum and shall be easily removed for water tank access.

HOSE BED DIVIDER

The hose bed shall be divided by two (2) 3/16" aluminum partitions that are fully adjustable by sliding in tracks located at the front and rear of the hose bed. The dividers shall be located as needed.

HOSE BED COVER

There shall be a red nylon/vinyl hose bed cover for the main hose bed. The cover shall be capable of being securely fastened at the front, sides and rear.

BODY HANDRAILS

Handrails shall be constructed of type 304 stainless steel 1.25 inch diameter tubing with bright finish and knurled gripping surface. Mounting flanges shall be constructed from 7 gauge, .180 thick, stainless sheet. Each grab rail shall have 90 degree returns to flanges. The ends of grab rail shall pass through the flanges and be welded to form one structural unit. The handrails, shall be mounted using 1.25" SS Hex bolts, with a barrier rubber gasket at each flange. Sufficient space shall allow for a gloved hand to firmly grip the rail.

The rails shall be located in the following areas (note: these are in addition to those previously mentioned in the cab section): There shall be one (1) handrail on each side of the access steps to the ladder.

These handrails are to be covered with ribbed rubber to prevent hand slipping when climbing the steps.

STEPS

There shall be one (1) fold-down step on each side of the front face of side compartments as required by N.F.P.A.

There shall be one (1) fold-down step at each side of the rear area.

There shall be two (2) pull-out steps, approximately 25-3/4" wide x 11-3/4" deep, provided on the right side of the apparatus for ease of accessing side stacked ground ladders. These steps shall be located one ahead of the rear axle and one behind the rear axle.

RUB RAILS

The body shall be equipped with heavy extruded aluminum rub rails at the sides and shall be spaced away from the body by 1/2" polymer spacers. The rub rails shall be polished to a bright finish and be fitted with custom cast end caps.

ALUMINUM TREADPLATE

All load bearing aluminum treadplate running boards shall be .155 thick bright annealed with a serrated embossed finish. Running boards and rear step edges shall be flanged down for added strength. Running boards shall also be flanged up to form kick plates.

All non-load bearing aluminum shall be .125" thick bright annealed finish. In areas where aluminum treadplate shall function as a load-bearing surface, there shall be a heavy steel sub-structure. This structure shall consist of 3" channel and 1-1/2" angle welded support. This shall assure that there shall be no flexing or cracking of running boards. The aluminum shall be insulated from the steel by closed cell foam body barrier material.

Treadplate locations:

- Skirting around front bumper.
- The step at the cab entrance.
- The jump seat steps.
- The running boards.
- The rear step.
- The top of the compartments.

BOOSTER TANK

The tank shall have a capacity of 500 U.S. gallons. The tank shall be constructed of 1/2" thick polypropylene sheet stock that is a non-corrosive stress relieved copolymer thermo-plastic. The booster tank shall be of a specific configuration and so designed to be completely independent of the body and compartments. All joints and seams shall be welded and/or formed and tested for maximum strength and integrity. The top of the booster tank shall be fitted with removable lifting eyes designed with a 3 to 1 safety factor to facilitate easy removability. The transverse swash partitions shall be manufactured of 3/8" polypropylene and extend from approximately 4" off the floor to just under the cover. The longitudinal swash partitions shall be constructed of 3/8" polypropylene and

extend from the floor of the tank through the cover to allow for positive welding and maximum integrity. All partitions shall be equipped with vent and air holes to permit movement of air and water between compartments. The partitions shall be designed to provide maximum water flow. All swash partitions shall interlock with one another and shall be welded to each other as well as to the walls of the tank. The tank shall have a combination vent and manual fill tower. The fill tower shall be constructed of 1/2" polypropylene and shall be a minimum dimension of 8" x 8" outer perimeter. The tower shall be located in the left front corner of the tank. The tower shall have 1/4" thick removable polypropylene screen and a polypropylene hinged-type cover. The tank cover shall be constructed of 1/2" thick polypropylene to incorporate a multi three-piece locking design which will allow for individual removal and inspection if necessary.

The sump shall be constructed of 1/2" polypropylene and be located in the left front quarter of the tank. The sump shall have a minimum of 3" national pipe threaded outlet on the bottom for a drain plug. This shall be used as a combination clean-out and drain. All tanks shall have an anti-swirl plate located approximately 2" above the sump.

All tank fill couplings shall be backed with flow deflectors to break up the stream of water entering the tank.

The tank shall rest on the body cross members in conjunction with such additional cross members, spaced at a distance that would not allow for more than 530 square inches of unsupported area under the tank floor.

The tank shall be completely removable without disturbing or dismantling the apparatus structure.

MASTER ELECTRICAL PANEL

The main chassis breaker panel shall be wired through the master disconnect solenoid and controlled by the three-position ignition rocker switch. The breaker panel shall be located in front of the officer on the interior firewall and shall be protected by a removable aluminum cover. It shall be as small as possible to accommodate the intended breakers.

The cover shall have an aluminum notebook holder on the exterior face accessible to the officer. The cover shall be painted with a durable finish to match the interior of the cab and shall be secured with two (2) thumb screws.

The breaker panel shall include up to 22 ground switched relays with circuit breaker protection. An integrated electrical sub-panel shall be provided and interfaced to the body and chassis through an engineered wire harness system. Twelve (12) 20-ampere relays and one (1) 70-ampere relay shall be provided for cab light bar and other electrical items. Two (2) additional relays shall be provided a mechanical siren.

Up to two (2) additional relay boards with circuit breaker protection shall be provided for additional loads as required. Each board shall contain four (4) relays. The relay boards shall be configured to trip with input from switch of positive-negative or load manager by moving the connector on the board (no tools required).

All relay boards shall be equipped with a power-on indicator light (red), input indicator light (green) and power output indicator light (red).
Up to twenty-three (23) additional automatic reset circuit breakers for non-switched loads that are remotely switched (i.e.: heater fans, hood lights, etc.) shall be provided. All relays and circuit breakers on the relay boards shall be pull-out/push-in replaceable.

All circuit breakers on the relay boards shall be 20 ampere automatic reset which can be doubled or tripled for 40 or 60-ampere capacity.
The system shall utilize Deutch DRC weather resistant connectors at the breaker panel, toe board and main dash connections.

All internal wire end terminals, including locking connectors, shall be mechanically affixed to the wire ends by matching terminal crimping presses to assure the highest quality terminations.

All internal splices shall be ultrasonically welded connections and all internal wiring shall be high temperature GXL type wire that is protected by wiring duct wherever possible.

All switches shall be ground controlled; no power going through any rocker switch. Any switch controlling a relay in the breaker panel shall be capable of being set to function only when the parking brake is set. All relays shall be tagged with the function that the relay is controlling.

BODY ELECTRIC SYSTEM

All body electrical wiring in the chassis shall be XLP cross link-insulated type. Wiring is to be color-coded and include function codes every three (3) inches.

Wiring harnesses shall be routed in protective, heat resistant loom, securely and neatly installed.

Two power distribution centers shall be provided in central locations for greater accessibility.

The power distribution centers shall contain automatic thermal self-resetting breakers, power control relays, flashers, diode modules, daytime driving light module, and engine and transmission data links. All breakers and relays shall be utilized in circuits which amp loads are substantially lower than the respective component rating thus ensuring long component life.

Power distribution centers shall be composed of a system of interlocking plastic modules for ease in custom construction. The power distribution centers shall be function oriented. The first shall be to control major truck function and the second to control overhead switching and interior operations. Each module shall be a single function coded and labeled to aid in troubleshooting. The centers also shall have accessory breakers and relays for future installations. All harnesses and power distribution centers shall be electrically tested prior to installation to ensure the highest system reliability.

All external harness interfaces shall be of a triple seal type connection to ensure a proper connection. The cab/chassis and the chassis/body connection points shall be mounted in accessible locations. Complete chassis wiring schematics shall be supplied with the apparatus.

The wiring harness contained on the chassis shall be designed to utilize wires of stranded copper or copper alloy of a gauge rated to carry 125% of maximum current for which the circuit shall be protected without exceeding 10% voltage drop across the circuit.

The wiring shall be uniquely identified by color code or circuit function code, labeled at a minimum of every three (3) inches. The identification of the wiring shall be referenced on a wiring diagram. All wires shall conform to SAEJ1127 (Battery Cable), SAEJ1128 (Low Tension Primary Cable), SAEJ1560 (Low Tension Thin Wall Primary Cable).

All harnesses shall be covered with moisture resistant loom with a minimum rating of 300 Degrees Fahrenheit and a flammability rating of VW-1 as defined in UL62. The covering of jacketed cable shall have a minimum rating of 289 degree Fahrenheit.

All harnesses shall be securely installed in areas protected against heat, liquid contaminants and damage. The harness connections and terminations shall use a method that provides a positive mechanical and electrical connection and shall be in accordance to the device manufacturer's instructions. No connections within the harness shall utilize wire nut, insulation displacement, or insulation piercing.

All circuits shall conform to SAE1292. All circuits shall be provided with low voltage over current protective devices. These devices shall be readily accessible and protected against heat in excess of component rating, mechanical damage, and water spray. Star washers shall not be used for ground connections.

BACK-UP ALARM

An Ecco model SA917 automatic self-adjusting electronic back-up alarm producing 87-112 dB shall be installed at the rear between the frame rails. It shall operate whenever the transmission's reverse gear is selected.

COMMUNICATION SYSTEM

A six position wireless David Clark intercom system shall be provided in the cab. The five positions include: driver, officer, and four crew seats. The driver and officer positions shall be interfaced with the 800 MHz radio. There shall be mounting clips/brackets for each belt pack near each seated position. The driver's and officer's brackets should be easily reachable and located in the forward field of view.

There shall also be mounting clips/brackets near each of the seated positions, minus the driver's seat, for portable radios. The front passenger bracket shall be easily reachable and located in the forward field of view.

COMPARTMENT LIGHTING

Each compartment shall be equipped with two (2) LED light strips which shall provide a consistent pattern to illuminate to entire compartment.

ELECTRICAL PROVISION

Wiring shall be provided in the cab for the future installation of owner furnished equipment. The location shall be determined during the pre-construction conference.

ANTENNA MOUNTING

Two (2) customer supplied radio antennas shall be installed in the cab roof with the coax cable run to the radio mounting area. The radio location shall be determined at the pre-construction meeting.

LICENSE PLATE BRACKET

A Cast Products LP0013 cast aluminum license plate bracket with LED light shall be provided at the rear of the apparatus.

TAIL/STOP/TURN LIGHTS

The rear tail/stop, directional (turn amber arrow), shall be Weldon LED 3884 Series lights and the backup lights shall be halogen. The 10.5" high x 8.5" wide rectangular tri-cluster lights shall be mounted in polished housings on the rear body panels.

LED ICC/MARKER LIGHTS

LED type ICC/marker lights shall be provided to meet D.O.T. requirements.

The rear step ICC lights shall be recessed in the step or mounted behind the step with cutouts in the step for the lights.

STEP LIGHTS

Step lights shall be provided, one each side on the front compartment face at pump panels. The lights shall be Whelen 2G Series LED lights.

Each step at the rear of the apparatus shall have a light to illuminate each step and the tailboard.

GROUND LIGHTING

The apparatus shall be equipped with lighting capable of illumination to meet NFPA requirements. Lighting shall be provided at areas under the driver and crew riding area exits and shall be automatically activated when the exit doors are opened. The ground lights shall be Truck-lite® LED model #44042C. Lighting required in other areas such as work areas, steps and walkways shall be activated when the parking brake is applied, provided the ICC lights are on.

OPTICAL WARNING SYSTEM

The optical warning system shall be capable of two separate signaling modes during emergency operations. One mode shall signal to drivers and pedestrians that the apparatus is responding to an emergency and is calling for the right-of-way and the other mode shall signal that the apparatus is stopped and is blocking the right-of-way. Switching shall be provided that senses the position of the parking brake.

A master optical warning device switch shall be provided to energize all of the optical warning devices provided. All lights shall operate at not less than the minimum flash rate per minute as specified by NFPA.

MAIN HOSE BED LIGHTING

There shall be one (1) Rigid Industries Dually D2 spotlight with diffusion lens mounted to the center hose bed front wall to illuminate the hose storage area. The light shall be mounted on a track and have sufficient slack in the power cable to allow movement of the light left or right by one foot each way.

UPPER LEVEL WARNING DEVICES

The upper level is divided into zones A, B, C and D and the PowerArc, Incorporated approved lighting package to be provided shall be as follows:

Zone A, B and D: One (1) PowerArc, model VM8506QE15-6P-R lightbar shall be mounted on the cab roof using PALB-M1 mounting feet. Any clear warning light(s) in the lightbar shall be disabled automatically for the “Blocking Right of Way” mode.

Zone B, C and D: One (1) PowerArc LED warning light model AO-VM1503QE08-R shall be mounted on the rear upper outermost corner on the driver side. One

(1) PowerArc LED warning light model AD-VM1503QE08-R shall be mounted on the rear outermost corner on the passenger side.

TRAFFIC ADVISOR

A Whelen LED TAL85 Traffic Advisor with a TACTRL1 Control Head shall be provided. The low profile Traffic Advisor shall be approximately 1-1/2" high x 2-1/2" deep x 44" long.

It shall incorporate an eight (8) LED lamp group that is in a cap style extruded aluminum housing with black powder painted finish and surface mounted to eliminate large body panel cutouts. It shall have high intensity LED's that are rated for over 100,000 hours of operation and have extremely low current consumption. The Control Head shall have a four function rotary switch for selection of: center to left, center to right, center to left and right, or flash patterns. It shall incorporate a dip switch on the rear panel to selects the choice of eight (8) different programmable flash patterns. The Control Head shall feature a visual LED status display.

OPTICOM

The vehicle shall be equipped with an Opticom Multimode Vehicle Kit (High Priority) part #76-1000-1137-0. This kit shall be integrated to work with the vehicles turn signals.

LOWER LEVEL WARNING DEVICES

The lower level is divided into zones A, B, C and D and the approved lighting package to be provided shall be as follows:
Zone A: Two (2) PowerArc LED warning lights, model MD90SUT-RR, shall be installed in the upper head light housing of the chassis on the driver and passenger side. Any clear warning light(s) in the lightbar shall be disabled automatically for the “Blocking Right of Way” mode.

Two (2) PowerArc LED warning light model 210-2R shall be mounted to the passenger and driver side of the custom housings used to hold the LED rectangular headlights.

Zone B: Two (2) PowerArc LED warning lights, model P14SM-R, shall be mounted, one on the passenger side on the mid-body outrigger face and one mounted above the rear wheel on the passenger side.

Zone C: Two (2) PowerArc LED warning light model P14SM-R shall be mounted on the lower rear outermost corner of the body on the passenger and driver side.

Zone D: Two (2) PowerArc LED warning lights, model P14SM-R, shall be mounted, one on the passenger side on the mid-body outrigger face and one mounted above the rear wheel on the passenger side.

SIREN

One (1) Whelen Model 295 SLSA1 electronic siren shall be installed at the cab instrument panel complete with noise canceling microphone. The horn button in the steering wheel, a switch on right hand side of cab floor and the control on the siren head shall actuate the siren. A selector switch shall be provided on the instrument panel for control of horn or siren by steering wheel button.

SIREN SPEAKER

Two Cast Products SA4201-5-A weatherproof siren speakers shall be provided and mounted behind the perforated front bumper.

FEDERAL Q2B SIREN

There shall be a Federal Q2B-NN siren installed in the center of the cab grille. The siren shall be securely mounted and activated by means of a solenoid and shall include a brake.

A siren foot switch shall be provided for the driver and officer, one on each side of the cab floor.

GENERATOR

The apparatus shall be equipped with a complete electrical power generation system. A Smart Power hydraulic 8.0 KW generator shall be provided and installed. The generator and wiring shall conform to present National Electric Codes as outlined in the National Fire Protection Association Standards.

The output of the generator shall be controlled by an internal hydraulic system. An electrical instrument gauge panel shall be provided for the operator to monitor and control all electrical operations and output. The generator shall be powered by a transmission power take off unit, through a hydraulic pump and motor. The generator shall be operable anytime the apparatus engine is running and meeting the minimum range of 950 RPM's.

The generator shall be mounted under the aerial platform so as to not consume available compartment space in the body compartments L1-R4.

120-VOLT OUTLET

A 120-volt outlet with weatherproof covers shall be provided. All 120 volt wiring shall be installed in liquid tight conduit.

BREAKER BOX

A circuit breaker box shall be provided with sixteen (16) spaces for GFI breakers which shall be provided as needed. All wiring shall be installed in liquid tight conduit.

LED TELESCOPIC SCENE LIGHT

Two (2) Fire Research Spectra LED Scene Light model SPA530-Q20 side mount push up telescopic lights shall be provided and installed. The light poles shall be anodized aluminum and have a knurled twist lock mechanism to secure the extension pole in position. The extension pole shall rotate 360 degrees. The outer pole shall be a grooved aluminum extrusion and qualify as an NFPA compliant handrail. The pole mounting brackets shall have a 2 3/4" offset. Wiring shall extend from the pole bottom with a 4' retractile cord.

Each lamphead shall have eighty four (84) ultra-bright white LEDs, 72 for flood lighting and 12 to provide a spot light beam pattern. It shall operate at 12/24 volts DC, draw 18/9 amps, and generate 20,000 lumens of light. Each lamphead shall have a unique lens that directs flood lighting onto the work area and focuses the spot light beam into the distance. Each lampheads angle of elevation shall be adjustable at a pivot in the mounting arm and the position locked with a round knurled locking knob. Each lamphead shall be no more than 5 3/8" high by 14" wide by 3 3/4" deep and have a heat resistant handle. Each lamphead and mounting arm shall be powder coated.

One (1) light shall be located on the side of the apparatus pedestal.

One (1) light shall be located on the apparatus turntable over the breathing air bottle.

CORD REEL

There shall be a Hannay Model ECR1616-17-18 electric rewind cable reel furnished and mounted under the aerial platform so as to not consume available compartment space in the body compartments L1-R4. The cord shall be deployable from the passenger side of the vehicle.

The reel shall come complete with 200 feet of 10/3 Seoprene Water-resistant (SOW) yellow jacketed cable. A Hannay Type "C" roller assembly and HS-3 cable stop ball shall be provided.

FOUR WAY RECEPTACLE

An Akron (GFE) four-way receptacle box with light shall be provided and hard wired to the end of the cable. The box shall be securely mounted in the immediate area of the cord reel. The mounting shall be a fabricated aluminum bracket equipped with a Velcro strap to secure the box.

GROUND LADDERS

The apparatus shall be equipped with heavy duty, box type "I" beam rail, ground ladders. The ladders shall meet the requirements of NFPA 1931 to ensure proper design and that sufficient strength is available for the service intended. The ground ladders shall be constructed of aluminum with non-welded, field replaceable rung to rail connections to simplify field repairs and removable plated steel butt spurs for added strength. A full 1/2", non-rotting, poly rope shall be provided for easy ladder operation.

- One (1) 10 ft. collapsible ladder, (mounted in fly section)
- One (1) 14 ft. combination ladder
- Two (2) 16 ft. roof ladders with roof hooks
- One (1) 24 ft. 2-section extension ladder
- One (1) 35 ft. 3-section extension ladder+

The ladders shall have a lifetime Warranty against manufacturing defects.

LADDER MOUNTING

The ladders shall be mounted on brackets on the side of the body and held in place by polished aluminum quick-release spring locks.

PIKE POLE

The following Nupla super duty I-Beam pike poles shall be provided and mounted.

- One (1) 8-foot Fire Hooks Unlimited NY Roof Hook
- One (1) 8-foot Fire Hooks Unlimited All Purpose Hook w/Gas Knob Shutoff
- One (1) 12-foot Fire Hooks Unlimited All Purpose Hook
- One (1) 12-foot Fire Hooks Unlimited National Hook Pike Pole

PIKE POLE STORAGE

The longer pike poles shall be recessed in a four-pole capacity compartment in the driver's side body and the shorter pike poles shall be recessed in holders fabricated to the backboard compartment mounted to the rear of the cab and accessible from the passenger side.

CORROSION REDUCTION POLICY

The manufacturer shall have in place a formal corrosion reduction program and assembly procedures designed for reducing and eliminating the possibility of corrosion.

It is understood that fire apparatus shall operate in harsh environments. At the time of the bid the apparatus manufacturer shall show proof of a corrosion policy. Failure to submit this information could be grounds for rejection. If a formal policy is not in place, explain in your bid how your firm shall take the necessary steps for corrosion reduction.

There shall be no exception to this requirement.

In addition to a formal program, the manufacturer shall show proof of testing corrosion reduction processes to ASTMB117. A copy of recent test shall be included in the bid.

Frame Rails

The chassis frame rails shall be coated with a high performance, two component, reinforced inorganic zinc rich primer with a proven cathodic protection makeup preferably Cathacoat 302HB. The surface shall be clean and free of all salts, chalk and oils prior to application. Where the primer has been broken during the frame assembly process, the area shall be touched up to reestablish the seal. Prior to finish painting, a second primer, Devran 201, shall be applied. Once the assembly of the frame is complete and the second primer is applied, the entire assembly shall be covered with high quality top coat paint preferably Imron 5000 or equal. The manufacturer shall submit with the bid a copy of the product brochure and or description of the primer to be used.

TURNTABLE PAINT

The turntable, side plates and lift cylinders shall be painted silver.

PAINT BEHIND LADDERS

The side metal shall be painted behind the ladder mounts on the right side of the truck.

PAINTED FRAME

The frame rails, fuel beam, and body subframe shall be painted glossy black.

Electro Plating

Steel and Iron brackets such as the pump module bracket shall be Zinc plated to protect against corrosion. Plating shall be in accordance with ASTM B663. The apparatus manufacturer shall list all components with plating.

Fasteners

In any area that a stainless steel screw or bolt head is to come in contact with aluminum or steel, painted or non-painted, the fastener shall have the underside of the head pre-coated with nylon. The nylon coating shall act as a barrier between the fastener head and the metal or painted surface. Screw or bolt taped into the metal shall be pre-coated with a Threadlocker type material pre-applied on the threads. When bolting together stainless steel, the manufacturer shall use a pan-head bolt with nylon coating under the head, a stainless washer with a rubber backing, and a Stover flange nut to secure the bolt. When mounting

aluminum components such as a step to the apparatus body, the manufacturer shall use stainless washers with rubber backing. All mounted components shall have a barrier material between the two surfaces. All rivet type fasteners shall be of the same material being secured. Whenever possible, pre-drill and tap all holes for mounting components such as lights, steps and hand rails prior to the paint process to reduce the corrosion opportunity. If a hole must be drilled into a previously painted surface, re-establish the paint barrier around the hole and use a flange-type nutsert with a gasket under the flange. Where possible, minimize the number of stainless trim screws in aluminum. Structural tape and or adhesive shall be used where possible for mounting trim to the body or cab. If a pre-treated screw or bolt is not available, hand apply Dynatex Boltlocker or Theadlocker on the threads of the screw, bolt or nutsert. This shall help seal threads from moisture and help prevent the fasteners from loosening. If lubricant is used when tapping the hole, clean out the lubricant and the shavings before applying blue Threadlocker into the hole.

Barrier Tape

Barrier tape shall be used on the backsides of all lights, trim pieces, or other components when bolting them to the apparatus; also when attaching stainless steel over an aluminum surface or when attaching aluminum treadplate to the stainless steel. All instances of dis-similar metals contacting each other require the addition of barrier tape between the metals where contact is made. Before applying the tape, be sure the metal surface is clean from oil or dirt by cleaning the surface with a 50/50 mix of alcohol and water or similar solvent.

Gaskets

Gaskets shall be used under all snaps, loops and fasteners for such items as for hose bed covers. Reestablish paint seal around the mounting hole edges after drilling. Mounting with Threadlocker coating shall be used. Flat washers with rubber backing shall be used behind all lights that have stainless screws.

Rollup Doors

1 3/4" X 1/16” barrier tape shall be used on the frame opening to act as barrier between the aluminum door rail and the painted door opening surface. Use a paint stick around the holes after drilling and tapping. In mounting the rails, use screws with the nylon under the head and Threadlocker on the threads for mounting the doorframes. Install barrier tape to the painted surface where the trim is located on top of the door opening.

Hinged Doors

Barrier tape shall be applied to the painted surface of the body and on the painted hinge side of the door. On the hinge side, mount tape out toward the edge to space over the barrel of the hinge, being sure to not touch the door. Make sure the hinge fits into the extrusion frame with no corner weld beads interfering with the door fit. Do not put the hinge in a bind or cause the stainless steel hinge to touch the aluminum. Install the doors using a truss head bolt with the nylon coating under the head and Threadlocker on the threads.

Painting Steel

The manufacturer shall wipe any oil residue dry, remove any rust and remove weld slag or smoke. Clean the surface with solvent before painting. Prime with one even coat of black Color primer, and then spray a topcoat over the primer for the finish coat. After bolts are tightened to the proper torque, touch up the bolt area and ends of the bolts with primer or cold galvanizing coating.

Mounting Emergency Lights and Options

All emergency lights, accessory mountings, Kussmaul covers, and 110 outlet boxes mounted to the body should be mounted with pre-coated Threadlocker and nylon under the head screws or bolts to minimize corrosion between dissimilar metals.

Electrical Grounding

Grounding straps shall be installed consisting of a minimum 2-gauge strap bolted to the chassis frame.

- A ground cable from the cab to the right side frame rail
- From the alternator to the right side frame rail
- From the pump module frame to the right side truck frame.
- Aerials: from the hydraulic and pump module framework.
- From the pump mount to the truck frame rail.
- From the body module to the right side truck frame.

Proper grounding shall help eliminate ground loop problems throughout the truck, reducing the possibility for electrolysis and corrosion to occur. Provide clean connection points on all ground connections, (remove paint where applicable), and spray or brush on electrical sealer as necessary. When installing foam

system pump wiring the power must come from a dedicated breaker to a power solenoid, and then to the power terminal provided by FoamLogix or FoamPro. Pay particular attention to the grounding detail for wire size and good grounding practice, including removing the paint at the point of ground attachment to the chassis. Keep the length of ground wire as short as practically possible.

SALT SPRAY TESTING

Salt spray test shall be used to confirm the relative resistance to corrosion of coated and uncoated metallic specimens, when exposed to a salt spray climate at an elevated temperature. Test specimens shall be placed in an enclosed chamber and exposed to a continuous indirect spray of neutral (pH 6.5 to 7.2) salt water solution, which falls-out on to the specimens at a rate of 1.0 to 2.0 ml/80cm²/hour, in a chamber temperature of +35C. This climate shall be maintained under constant steady state conditions.

Method

Salt fog testing shall be performed by placing samples in a test cabinet that has been designed in accordance with Paragraph 4 (Apparatus) of ASTM B117 and operated in accordance with Paragraph 10 (Conditions) of ASTM B117. A 5% salt solution, prepared by dissolving sodium chloride into water that meets the requirements of ASTM D1193 Specification for Reagent Water, Type IV is supplied to the chamber. At the time the samples are placed into test, the cabinet should be pre-conditioned to the operating temperature of 35ºC and fogging a 5% salt solution at the specified rate. The fog collection rate shall be determined by placing a minimum of two 80 sq. cm. funnels inserted into measuring cylinders graduated in ml. inside the chamber. One collection device shall be located nearest the nozzle and one in the farthest corner.

Orientation

Unless otherwise agreed upon, the samples are to be placed at a 15-30 degree angle from vertical or tested in the “installed” position. This orientation shall allow the condensation to run down the specimens and minimize condensation pooling. Overcrowding of samples within the cabinet should be avoided. An important aspect of the test is the utilization of a free-falling mist, which uniformly settles on the test samples. Samples should be placed in the chamber so that condensation does not drip from one to another.

Test durations

Test durations shall be 500 hours except for sample rotation and daily monitoring of collection rates, the cabinet should remain closed for the duration of the test.

PAINTING

All exposed metal surfaces not chrome plated, polished stainless steel or bright aluminum tread plate shall be thoroughly cleaned and prepared for painting. All irregularities in painted surfaces shall be rubbed down and all seams shall be caulked before the application of the finish coat.
All removable items such as brackets, compartment doors, door hinges, trim, etc. shall be removed and painted separately to insure finish paint behind all mounted items.

Body assemblies that cannot be finish painted after assembly shall be finish painted before assembly. Both aluminum and steel surfaces to be painted shall be primed with a two (2)-component primer which is compatible with the finish coat. The apparatus shall be finish painted with a polyurethane base/clear system.

Utilizing the stainless steel body fabrication, the interior of all compartments, inside hose bed, and surrounding areas adjacent to compartments doors shall remain a #4 brushed stainless steel finish. This practice shall eliminate the possibility of paint chipping, and electrolysis of aluminum which can cause corrosive action between dissimilar metals. Chassis and compartment doors shall be painted the color indicated.

Prior to reassembly and reinstallation of lights, handrails, door hardware and any miscellaneous items, an isolation tape or gasket material shall be used to prevent damage to the finish painted surfaces. A nylon washer shall be installed under each acorn nut or metal screw that is fastened directly to a painted surface.

The following paint process shall be utilized:

Surface Preparation:

- Wash surface thoroughly with mild detergent.
- Clean and de-grease with Prep-Sol 3812S.
- Sand and feather edge using 400 grit or finer on a dual action sander.
- Remove sanding dust with a cleaner compatible with polyurethane base coat/clear coat final finish.

Substrate treatment:

- Use a Metal Conditioner followed with a Conversion Coating product.

Priming:

- Use a priming 615S pretreatment.
- Use a self etching primer applied to achieve a 1.5 mil dft minimum.
- Use Prime N Seal sealer compatible with polyurethane base coat.

Color Coat:

- Apply polyurethane base coat 1-2 mil dft minimum.

Clear coat:

- Apply polyurethane clear coat 2 mil dft minimum.

PAINT-TWO TONE CAB

The cab exterior surfaces shall be two (2) colors. The paint break line shall be at the bottom of the windshield.

LETTERING

Up to Sixty (60) 3" 22KT Gold laminate goldleaf letters, with left hand shading and right hand outline to equal 3-5/8" letter, shall be provided.

Nine (9) additional 11" white reflective letters with black shading shall be provided.

Seven (7) additional red reflective letters shall be provided for the front bumper and be as tall as possible to fit between the bumper ribs.

STRIPING

A 4" Scotchlite stripe shall be provided across the front of the cab and along each side of the apparatus.

STRIPING, CHEVRON STYLE, REAR BODY

The apparatus shall have 6” red and yellow reflective Chevron style striping affixed to the right and left portions of the rear body. The striping shall be set in a manner to have the effect of an inverted “V” shape. The stripe shall travel low to high from the outside to the inside.

GOLDLEAF STRIPE

A 1/2" 22KT gold laminate goldleaf stripe shall be provided on each side of the apparatus.

BOOM SIGN

A boom sign, approximately 66" x 10", shall be provided on each side of the boom. The background of the boom sign shall be painted primary truck color.

BOOM SIGN LETTERING

Up to sixteen (20) 6" 22KT Gold laminated goldleaf letters, with left hand shading and right hand outline to equal 6-5/8" letter, shall be provided on each boom sign.

MISCELLANEOUS EQUIPMENT FURNISHED

1 pt. touch-up paint

WHEEL CHOCKS

Two (2) Ziamatic #SAC-44 folding wheel chocks with SQCH-44H holders shall be provided. The wheel chocks shall be located in an area close to the rear axle easily accessible from the side of the apparatus.

RECHARGEABLE HANDLIGHT

Four (4) Streamlight® SL-44451 Fire Vulcan® LED rechargeable handlights with 12 volt chargers shall be provided and mounted.

ADAPTER

One (1) 6" NST x 5" Storz adapter with cap and chain shall be provided on the driver's side.

The passenger's side main pump intake adapter shall be a TFT Jumbo Low Profile Ball Intake Valve with parallel shaft drive AXD3ST-NX-F fitted with 5" Storz.

AERIAL DEVICE

An aerial device with a minimum 75-foot vertical reach shall be provided. The height dimension shall be calculated with the boom at 75 degrees. The horizontal reach of the device shall not be less than 67 feet. The overall height of the apparatus with the aerial device in the bedded positions shall be no more than 10 feet, 10 inches and the overall length of vehicle shall be not more than 38 feet, 8 inch.

CLIMBING LADDER

An NFPA compliant climbing ladder with high handrails shall be provided for a continuous escape way and accessibility. Each section of the ladder shall be attached to a specific boom section allowing the ladder to extend automatically at the same rate as the boom.

The climbing area shall be free of cables, waterway and extension cylinders. The ladder climbing area shall be a continuous escape way free of all obstacles.

The ladder shall not twist more than 3/8" when load of 400 pounds is applied to the fly section. At the top section of the ladder there shall be a set of controls for the nozzle and folding steps for the nozzle operator.

Rung alignment indicator and bed alignment indicator shall be provided.

Minimum Climbing Ladder Dimensions:

	Width	Height
First Section	33.5"	18"
Second Section	29"	16"
Third Section	26"	14.25"
Fourth Section	23"	12.5"

Access to the climbing ladder and the mid-ship turntable area shall be accomplished through one (1) recessed step area located on left side directly below the mid-ship turntable.

AERIAL EGRESS

The tip of the aerial ladder shall be designed angled slightly downward 20 degrees to allow for easy access to and from the ladder end.

TURNTABLE

The turntable shall be a minimum of 1/2" thick plate and 42" in diameter. The side plates to which the main base section of the aerial ladder is connected shall have a minimum height of four feet and shall include angle gussets of approximately 50" in length that shall tolerate the side thrust and tremendous forces to which the unit shall be subjected.

The turntable shall be attached directly on top of the mainframe assembly using 24-5/8" diameter grade 8 bolts. Turntable side plates shall be positioned at a 45-degree angle, exactly opposite the angle of the lift cylinders, to act as a partial counter-balance weight to the ladder.

The turntable shall be equipped with a rotating mechanism with a steel balanced fly wheel connected at one end which shall rotate the turntable 360 degrees through a planetary gear box that shall handle torque loads imposed by water hammer and hose breakage. The rotating mechanism shall give the turntable and ladder built-in coast as an added safety precaution to avoid lateral ladder side-to-side deflection (reactionary whipping effect) caused by the ladder being stopped suddenly.

The power operated turntable shall provide continuous rotating of the aerial structure clockwise or counter clockwise, thus enabling the structure to be positioned in any segment through 360 degrees. The rotating mechanism shall also provide sufficient power to rotate the aerial sections in any direction at any

angle, fully extended, while carrying the manufacturer's rated load capacity with the waterway in operation and discharging water at the tip of the aerial fly section.

Provisions shall be made for manual operation of the rotation system should loss of hydraulic power occur. This shall be done through manual rotation of the flywheel to rotate the ladder and turntable. There shall also be a manual means of retracting the ladder and an auxiliary bleed down valve for the hydraulic raise/lower cylinders.

There shall be one heavy-duty solid steel shaft that shall attach the base section of the ladder (at the top and very back) and the top portion of the turntable side plates together. The minimum steel shaft measurement shall be 34" long, 4" diameter.

The complete rotation system shall have built in relief to prevent damage from rotating the ladder into buildings or from overloaded water streams. Suitable indicators, clearly visible at all times, shall be provided to facilitate correct alignment of the turntable with the bed of the ladder. An automatic light shall be used to show correct alignment for bedding of the ladder from the turntable control station.

TURNTABLE BEARING

The turntable bearing shall be bolted to the top of the mainframe assembly and have a gear diameter of 42".

TURNTABLE SUPPORT

The turntable support shall be mounted mid-ship of truck forward the pump panel.

The turntable support assembly shall be a welded steel box beam structure extending across the chassis frame 34" x 39" in depth to take shock loads imposed by water turret operation and to give a reserve strength factor to compensate for hose breakage and water hammer. To further compensate for hose breakage and water hammer, lateral tower deflection, there shall be steel support gusset beams, one each side, welded onto the turntable side plates.

HYDRAULICS

There shall be a hydraulic control valve for operating the outrigger jacks located at the pump panel station. The main hydraulic valve body shall be the four-way design and located near the pump panel station. All hydraulic lines shall be of the double braided type, rated at 3,000 lb. pressure or above. A PTO hourmeter shall be provided to record the time when the aerial hydraulic system is engaged.

There shall be a hydraulic power take-off pump activated from the cab dash to operate aerial boom and outriggers. The hydraulic tank shall be made of treated steel or fiberglass and shall be equipped with a strainer and return filter system.

Cooling of the hydraulic oil shall be accomplished through a built-in heat exchanger that constantly cools the oil, whenever the pump is operating.

AUXILIARY HYDRAULIC POWER

An emergency auxiliary hydraulic motor shall be furnished to provide a backup hydraulic system, should the regular hydraulic system fail. An electric switch located inside the hydraulic compartment shall start the auxiliary hydraulic motor. The auxiliary hydraulic motor shall be installed in the left side compartment directly below the midship turntable for ease of access and maintenance.

INTERLOCK

An interlock shall be provided that prevents operation of the aerial device until the chassis spring brakes have been set and the transmission has been placed in neutral or the transmission is in the drive position with the driveline to the rear axle disengaged.

An interlock shall be provided that allows operation of the engine speed control only after the chassis spring brakes have been set and the transmission is in neutral.

An interlock system shall be provided to prevent the lifting of the aerial device from the travel position until all the stabilizers are in a configuration to meet the stability requirements. The interlock system shall also prevent the moving of the stabilizers unless the aerial device is in the travel position.

One (1) limit switch shall be installed at the cradle to prevent operation of the stabilizer once the aerial has been elevated from the nested position.

OUTRIGGER JACKS

Two (2) hydraulically operated underslung scissor-type stabilizing jacks shall be attached to the midship mounted main frame assembly, one (1) jack on each side of vehicle with a minimum spread of 16 feet. Both jacks shall be operated by two (2) midship mounted hydraulic valve handles.

The hydraulic cylinders shall be enclosed in a protective heavy duty tubular frame. A solid steel fail-safe pin shall be provided for each jack tube. Said pins shall be manually inserted through the tubes after the outrigger jacks have been positioned.

The outrigger jacks shall have a maximum spread of 16 feet from pad to pad. The control is electric over hydraulic with electric push button activation.

BOOM ASSEMBLY

Ladder construction shall be of the open lattice, non-crossing enclosed box design of truss type construction to retain lightweight and maximum stability for the horizontal reach. The material used shall be heat-treated aluminum, light alloy, #6061-T6. There shall be no welding on the ladder sections (so as not to lower the yield strength of material) and all lattice attachments shall be put together with aircraft Huck bolt fasteners or equivalent. Each section (total of four sections) shall have a minimum of 500 aircraft Huck bolt fasteners or equivalent.

The ladder shall have the capability of dissipating heat quickly. The ladder shall be able to shed massive ice buildup during freezing conditions. The ladder shall be left in a natural aluminum finish.

EXTENSION AND RETRACTION

The boom shall be extended by a hydraulic ram mounted in the horizontal center and off the bottom of the base section. The cylinder shall be mounted at the end of the base section and supported through the middle to accommodate the load stress of the boom.

The extension/retraction cylinder shaft size shall be a minimum of 3-1/2" in diameter. The cylinder rod shall have a special hollowed out design in order to save weight.

The third and fourth sections shall be connected to the second section of the ladder by two aircraft cables. This design feature eliminates the extra weight of

hydraulic cylinders on the third and fourth sections should it be horizontally extended to the side of the apparatus.

As a safeguard feature, the system shall be structurally and hydraulically designed and mounted to prevent rapid descent (retraction) of the aerial unit in the event of a detachment, failure or hydraulic hose break. In the event of failure of an extension/retraction mechanism during operation, the gravity descent of the ladder shall be kept at a speed which shall prevent damage to the equipment and/or danger to personnel. Provisions shall be made to prevent damage at full extension/retraction. There shall be a single check valve with an orifice attachment on each cylinder. This shall prevent any failure of the ladder by malfunction of cylinder check valves.

All sections of the ladder shall extend and retract (slide) on 24 special polymer slide blocks. Each slide block shall be bolted into place and shall be removable for inspection and maintenance.

LIFTING CYLINDERS

The raising and lowering mechanism shall consist of two hydraulic cylinders approximately 4.5" in diameter. The cylinders shall be attached to the boom assembly in a manner that requires only 50% of the lifting force of the boom. The cylinders shall be capable of lifting the full rated load of 750 lb. with the boom at full horizontal extension.

The power operated raising and lowering cylinders shall provide movement of the boom rapidly and smoothly without undue sway or vibration. A positive locking device shall be provided so the desired angle of elevation can be maintained indefinitely without dependence upon engine power.

As a safeguard feature, the lifting system shall be structurally and hydraulically designed and mounted to prevent rapid descent (lowering) of the aerial unit in the event of detachment, failure or hydraulic hose break. In the event of failure of any raising mechanism during operation, the gravity descent of the ladder shall be kept at a speed, which shall prevent damage to the equipment or danger to personnel. There shall be a single check valve (holding valve) with an orifice (in-line restrictor) attachment on each cylinder. This shall prevent any failure of the ladder by malfunction of cylinder check valves.

BOOM CONTROLS

There shall be an operator's position with four controls located at the base of the turntable next to the left side pump panel area. The controls shall be spring loaded to bring any operation of the aerial controls back to a neutral position. The four controls shall have the following functions:

1. Outrigger jack controls.
2. Raise and lower.
3. Extend and retract.
4. Rotation 360 degrees right and left.

The controls shall be equipped with a latching, hinged cover for protection. A hydraulic lockout shall be provided that shall prevent aerial operation until the outrigger jacks are set into position. Hydraulic power shall transfer to aerial operation when the outriggers are set. Power shall only be transferable back to the outriggers after the aerial has been bedded.

There shall be a plaque located at the controls displaying functions.

A slide out step shall be provided at the controls for safety of the operator. There shall be a warning light in the cab to indicate the step is not properly stowed.

INCLINOMETER

An illuminated inclinometer shall be provided and mounted in plain view of the pedestal operator location.

CENTRALIZED CONTROLS

All outrigger jack controls, turntable controls and pump controls shall be located in one centralized area to allow person(s) close proximity to all control stations of the truck and to allow faster set up time for all operations of the truck.

AERIAL DATA PLAQUES

Load instruction plates shall be located at the turntable pedestal control station indicating the recommended safe load of the aerial. The aerial shall carry the rated load capacity indicated in the following manner: raise, extend, rotate, retract and lower without exceeding the hydraulic pressures prescribed by the manufacturer.

OPERATIONAL TEST

After starting the engine, setting the jacks and transmitting power to the aerial, a complete cycle of the aerial operation shall be carried out as follows: With one person operating the machine from the control station, raise the aerial from the bedded position, rotate 90 degrees and extend to full height. This shall be completed in less than 150 seconds, smoothly without vibration.

WATERWAY

The aerial waterway shall be constructed of heavy duty, light weight, telescopic, aluminum tubing. The water supply line shall come directly off the main pump discharge manifold and shall be piped through smooth high pressure piping without the use of 90 degree chicksan joints, to reduce friction loss. The water flow shall be controlled by a full flow ball valve to eliminate any possibility of water hammer on the waterway. The water shall be passed through a special 4" passage rotating swivel designed to also provide hydraulic passages and electrical circuits to the turntable.

Waterway piping immediately above the hydraulic swivel shall have one 90 degree elbow connected to a straight pipe attached to a reinforced stainless steel braided flex tube. There shall be no chicksan swivels or multiple bends or twists of the waterway pipe immediately above the hydraulic swivel, which would increase friction loss.

The base section of the waterway shall be a 3-1/2" minimum diameter and finish with a larger 5" diameter in the fourth section of the aerial. This shall be done in order to decrease the friction loss as much as possible while increasing the water flow. The boom shall completely enclose the waterway, thereby protecting it from possible damage from buildings, roof cornices, etc. A 1.5” waterway drain valve shall be provided, and controlled from the pump operator’s panel.

The waterway shall have the capability of flowing a minimum of 1250 gallons per minute.

An automatic relief valve shall be provided in the waterway to eliminate any damage to the waterway by pressure shock or retracting the boom with the drain valve closed.

WATERWAY CONTROLLER & FLOWMETER

The waterway valve controller and flowmeter shall be an Akron model 9315. The controller/flowmeter shall be provided on the pump operator's panel.
The control shall be of a current limiting design, requiring no clutches in the motor. The unit shall have momentary open and close booted switches to operate the actuator. The controller shall have individual red, yellow and green long life LED's with light pipes for maximum visibility. The lights shall indicate closed, throttled and open. The unit shall have solid-state electronics to provide easy, accurate flow calibration through electric programming, two-button operation to read pressure, flow and total flow. 5/8" tall LED numerals shall show pressure and flow. The controller shall have a 5-year warranty.

VALVE ACTUATOR

The valve shall be electrically actuated with a 25:1 ratio valve actuator.

MONITOR/NOZZLE

An Elkhart #8294-04 Scorpion lightweight monitor shall be provided. It shall be attached to the end of the aerial with a 4-bolt flange. This monitor shall be capable of full flow of the aerial waterway up to 1500 G.P.M. Positioning of the monitor shall be accomplished through electric controls located at the aerial tip, pump panel and hand held transmitter.

This monitor shall be equipped with an Elkhart SM 2000E nozzle. The nozzle shall have automatic flow rates of 350 - 2000 G.P.M.

INTERCOM

A Fire Research two-way voice communication system shall be provided between the aerial ladder operator's position and the tip of the ladder. The speaker/microphone at the operator's position shall be equipped with a latching, hinged cover for protection. The speaker/microphone at the tip shall allow for hands-free operation.

BREATHING AIR SYSTEM

A breathing air system shall be provided to the tip of the ladder. The system shall be complete with low air warning alarm. One (1) 4500-psi cylinder shall be provided with pressure regulator mounted at cylinder with relief valve. All valves,

pressure regulators and gauges shall be protected from accidental damage. Low-pressure air hose and reel shall be connected to a quick disconnect.

ELECTRIC UP THE LADDER

A 110-volt circuit shall be provided up the ladder, complete with reel and junction box.

AERIAL LED FLOODLIGHT

There shall be one (1) LED flood/scene light located at the aerial tip.

AERIAL SPOT LIGHTS

There shall be three (3) Rigid Industries Dually D2 spotlights for the aerial tower; one Dually D2 spotlight with diffusion lens shall be mounted at the tip of the ladder, and two (2) Dually D2 Driving at the base section of the ladder, one each side to act as aerial tracking lights.

CAMERA SYSTEM

A Safety Vision SVR-4100 DVR camera system or equivalent shall be provided. There shall be a camera mounted at the tip of the ladder and a DVR system that can be viewed from an internet web address. There shall also be a rear back up camera with a monitor in the cab. A split screen monitor that can view the cameras at the rear of the truck and the tip of the ladder shall be located at the pump panel.

OPERATION AND SERVICE MANUALS

Complete "Operation and Service" manuals shall be supplied with the completed apparatus, one (1) printed copy and one (1) CD. Service manual instructions shall include service, maintenance and troubleshooting for major and minor components of the truck. The apparatus manufacturer shall supply part numbers for major components (i.e. Engine, Axles, Transmission, Pump, etc.). A table of contents, hydraulic, air brake and overall apparatus wiring schematics shall be included.

A video demonstration DVD on the operation of the truck shall be supplied with the manuals.

WARRANTIES

The following minimum warranties shall be supplied at time of delivery:

- The apparatus shall be warranted to be free from mechanical defects in workmanship for a period of one (1) year. The apparatus shall be covered for parts and labor costs associated with repairs for a period one (1) year.
- Life-time warranty on the frame.
- Seven (7) year warranty on paint.
- Ten (10) body structural warranty
- Ten (10) year cab structural warranty
- Two (2) year aerial mechanical warranty
- Twenty (20) year aerial structural warranty
- Manufacturers Warranties for all major components.

Detailed warranty documents shall be included for complete coverage on each of these warranties.

MANUFACTURING & LOCATIONS

The apparatus shall be manufactured in facilities wholly owned and operated by the company. A complete stock of service parts, as well as service shall be provided on a 24 hour around the clock basis. The company shall maintain parts and service for a minimum period of twenty (20) years on each apparatus model manufactured.

SERVICE CENTER

The successful bidder must have a factory authorized and fully staffed service center within a fifty (50) mile radius of the City of Franklin. The name of service center, address, telephone number(s) and contact person must be included with bid.

INSURANCE REQUIREMENTS

Prior to award of the procurement by the City, the successful bidder shall provide one or more unexpired certificates of insurance providing evidence of the following minimum types and limits of insurance coverage:

Type of Coverage	Limits of Coverage	Certificate of Insurance
Commercial General Liability	$1,000,000 Each Occurrence $2,000,000 General Aggregate $1,000,000 Personal and Advertising Injury $2,000,000 Products-Completed Operations Aggregate	Certificate of Insurance shall include the City of Franklin as Additional Insured with attachment of the Additional Insured endorsement
Automobile Liability (Owned, Non-Owned, and Hired Vehicles)	$1,000,000 Combined Single Limit Each Accident	Certificate Holder only
Workers Compensation	Statutory limits	Certificate Holder only
Employers Liability	$1,000,000 Bodily Injury Each Accident $1,000,000 Policy Limit Bodily Injury by Disease $1,000,000 Each Employee Bodily Injury by Disease	Certificate Holder only

If and when insurance coverage documented by the certificate(s) of insurance referenced above expires before the expiration of any specified term of award, including any extensions thereto, or the supply, delivery and acceptance of the ordered products and/or services, then the successful proposer shall immediately suspend work or supply unless and until it provides one or more unexpired replacement certificates of insurance that indicates the new date(s) of insurance coverage expiration and that meets or exceeds the insurance requirements as specified above.

In the event that insurance coverage documented by the certificate(s) of insurance referenced above is materially modified or canceled before the expiration of any specified term of award, including any extensions thereto, or the supply, delivery and acceptance of the ordered products and/or services, then the successful proposer shall, immediately upon learning of any such material modification or cancelation, suspend work or supply and shall, within three (3) calendar days of such learning, notify the City of any such material modification or cancelation.