SPECIFIC SPECIFICATIONS AND SPECIAL CONDITIONS
FOR EVENT# 1955 - AERIAL APPARATUS

4.0 The purpose of these specifications is to describe the requirements for an Aerial Apparatus for use by the City of Savannah’s Fire Department.

To submit pricing electronically for this event, enter pricing for each line item shown under the lines tab on the event summary. To enter pricing manually, complete the attached bid proposal form.

A pre-bid conference has been scheduled to be conducted at the Purchasing Office, Third Floor, City Hall, 2 E. Bay Street, Savannah, GA. This meeting will allow contractors to discuss the specifications and resolve any questions and/or misunderstandings that may arise with city staff. You are invited to attend.

4.1 It is the intent of these specifications to cover the furnishing and delivery to the purchaser a complete apparatus 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. Minor details of construction and materials where not otherwise specified are left to the discretion of the contractor, 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 specified in these specifications.

4.2 Bids shall only be considered from companies which have an established reputation in the field of fire apparatus construction and have been in business for a minimum of ten (10) years.

Each bid shall be accompanied by a set of "Contractor's Specifications" consisting of a detailed description of the apparatus and equipment proposed and to which the apparatus furnished under contract must conform. Computer run-off sheets are not acceptable as descriptive literature.

4.3 The specifications shall indicate size, type, model and make of all component parts and equipment.

4.4 It is the intent of the fire department to purchase a unit that meets certain performance criteria that entails vehicle weight, center of gravity, overall height, compartment space, etc. This vehicle must perform to certain standards laid out throughout this detailed specification.
4.5 STATEMENT OF EXCEPTIONS TO NFPA 1901

If, at the time of delivery, the apparatus manufacturer is not in compliance, a statement of exceptions must be provided as follows:

- The specific standard affected.
- A statement describing why the manufacturer is not in compliance.
- A description of the remedy, and who the responsible party is.

The document must be signed by an officer of the company, and an authorized agent of the purchaser. **NO EXCEPTIONS**

4.6 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. Special consideration shall be given to the following points: Accessibility to various areas requiring periodic maintenance, ease of operation (including both pumping and driving) and symmetrical proportions.

Construction must be rugged and 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."

4.7 PERFORMANCE TESTS AND REQUIREMENTS

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

a. 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.

b. 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.

c. 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).
d. The apparatus shall be tested and approved by a qualified testing agency in accordance with their standard practices for pumping engines.

e. The contractor shall furnish copies of the Pump Manufacturer's Certification of Hydrostatic Test (if applicable), the Engine Manufacturer's current Certified Brake Horsepower Curve and the Manufacturer's Record of Construction Details.

4.8 FAILURE TO MEET TESTS

In the event the apparatus fails to meet the test requirements of these specifications on the first trial, a second trial may be made at the option of the bidder within thirty (30) days of the date of the first trials. Such trials shall be final and conclusive and failure to comply with these requirements shall be cause for rejection. Permission to keep and/or store the apparatus in any building owned or occupied by the purchaser shall not constitute acceptance of same.

4.9 EXCEPTIONS TO SPECIFICATIONS

The following specifications shall be strictly adhered to. Exceptions shall be considered if they are deemed equal to or superior to the specifications, provided they are fully explained on a separate page entitled "EXCEPTIONS TO SPECIFICATIONS." Exceptions shall be listed by page and paragraph.

Failure to denote exceptions in the above manner shall result in immediate rejection of the proposal. In addition a general statement taking "TOTAL EXCEPTION" to the specifications shall result in immediate rejection of bid.

4.10 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). Certified Laboratories certificate shall be submitted by the manufacturer. Weight of apparatus shall meet all federal axle load laws.

4.11 DELIVERY REQUIREMENTS

The apparatus 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 purchaser. Any and all alterations required at the scene of delivery to comply with these specifications must be done at the contractor's expense.
4.12 PURCHASER RIGHTS

The Purchaser reserves the right to accept or reject any bid. The purchaser also reserves the right to award in their best interest and reserves the right to waive any formalities.

4.13 U.S.A. MANUFACTURER

The entire apparatus shall be assembled within the borders of the Continental United States to insure more readily available parts (without added costs and delays caused by tariffs and customs) and service, as well as protecting the purchaser should legal action ever be required.

4.14 MANUFACTURER’S EXPERIENCE

Each manufacturer shall have been in business making similar apparatus for a minimum of seventy-five (75) years and must have had single ownership for more than fifty (50) years.

4.15 ELIMINATION OF DIVIDED RESPONSIBILITY

It is required that each bidder produce both the chassis and complete apparatus. To eliminate divided responsibility and service, the chassis and body must be manufactured by the same Company. Manufacturer shall state the number of years the Company has been producing their own chassis and body. Manufacturer shall state compliance with the paragraph. NO EXCEPTIONS.

4.16 FAMA COMPLIANCE

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

4.17 PRICING OF FUTURE PURCHASES AND “TAG ON” ORDERS

Apparatus purchased in future years beyond the bid award date are subject to cost increases for material and labor. The successful bidder shall extend the proposed price for future years through the use industry standards in material cost, economic fluctuations, and industry specific price increases.

Note: Any legislated or regulated changes as mandated by federal, state, or local governments shall be an exception to the above statement. Any new apparatus purchased requiring such changes shall be subject to the additional costs associated with those changes. A detailed summary shall be provided to the purchaser at the time of request. These mandated changes also include EPA, NFPA, and ISO mandates driven in the fire industry.

4.18 FUTURE PURCHASES AND “TAG ON” ORDERS
The successful bidder shall accept “tag on” orders to this bid proposal for a period not to exceed three (3) years from the bid opening date. The successful bidder shall honor the “tag on” order from any municipality within the United States or Canada.

4.19 CONFIGURATION OF TAG ON ORDERS

In many cases the entity wishing to “tag on” to an existing order may require their apparatus to be configured differently from the original proposed apparatus. The successful bidder shall allow changes to the configuration within good engineering guidelines. The changes shall be subject to current pricing in effect at the time of order. For example, a different engine may be required. This shall be considered a “change order” and the purchase price shall be adjusted up or down depending on the current option price.

4.20 BID SEQUENCE

For ease of evaluation, all bid proposals shall be submitted in the same order as the fire department’s specification. **NO EXCEPTIONS.**

4.21 PROPOSAL DRAWING

A general layout drawing depicting the apparatus layout and appearance shall be provided with the bid. The drawing shall consist of left side, right side, frontal and rear elevation views. Apparatus equipped with a fire pump, shall have a general layout view of the pump operators panel scaled the same as the elevation views. The drawing shall be a depiction of the actual apparatus proposed and not of a generic similar product.

4.22 APPROVAL DRAWING

After the award of bid and pre-construction conference, a detailed layout drawing depicting the apparatus layout and appearance including any changes agreed upon shall be provided for customer review and signature. The drawing shall become part of the contract documents. The drawing shall consist of left side, right side, frontal and rear elevation views. Apparatus equipped with a fire pump, shall have a general layout view of the pump operators panel scaled the same as the elevation views.

4.23 PROPOSAL GUARANTEE

A certified check or bid bond in the sum of ten percent (10%) of the total bid price shall be submitted with the “Bid Proposal” at the time of the bid. The full amount of the bid surety shall be returned to the unsuccessful bidders following the award of the contract to the successful bidder.

4.24 PERFORMANCE BOND
Within twenty (20) days of notification to the successful bidder by the purchaser, prior to any work commencing on the proposed apparatus, the successful bidder shall, at their own expense, obtain and submit to the purchasing entity a performance bond in the amount of 100% equal to the total contract price.

Additionally, each bidder must disclose the price/amount it pays for bonding, per $1,000. This is to demonstrate the economic stability and credit worthiness of the bidder. NO EXCEPTIONS.

4.25 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. Chassis matching much of Savannah’s fleet in parts and service will be given an advantage in the evaluation process.

4.26 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.

The cab shall be built entirely by the apparatus manufacturer within the same facilities (no exceptions). 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.

4.27 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.

All vertical walls will be 3/16 aluminum. All vertical pillars will be tubular ¼ inch extrusions.

4.28 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. **NO EXCEPTIONS**

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. **NO EXCEPTIONS**

4.29 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. **NO EXCEPTIONS**

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. **NO EXCEPTIONS**

4.30 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 62”
- Total Cab Length (excluding bumper) 130”

4.31 FENDER CROWNS

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

4.32 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.

4.33 CAB INSULATION

The exterior walls, doors, and ceiling of the cab shall be insulated from the heat and cold, and to further reduce noise levels inside the cab. The cab interior sound levels shall not exceed 90 decibels at 45 mph in all cab seat positions. NO EXCEPTIONS

4.34 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”

4.35 DIAMOND PLATE, CAB ROOF

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

4.36 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.

4.37 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.

4.38 CAB STEPS

The lower cab steps shall be no more than 22” from the ground. An intermediate step shall be provided, midway 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.

4.39 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.

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

A test shall be conducted 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 apparatus cab 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.

The test shall be conducted by a certified independent third party testing institution.

A letter stating successful completion of the above test on the brand of cab being supplied shall be included in the bid. There shall be “no exception” to this requirement.

4.41 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.

4.42 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.

4.43 CAB 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 door latch mechanism shall utilize control cable 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"
Rear 36.5" x 73"

4.44 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. NO EXCEPTIONS.

4.45 REAR CAB WINDOWS

Two sliding windows approximately 16.25" wide x 14.25" high shall be provided in the back wall of the cab.
4.46 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.

4.47 COMPUTER TRAY

There shall be a slide-out tray in front of the officer’s seat for a laptop computer or other use and one (1) 12 V DC Power supply at this location.

4.48 CENTER CONSOLE

There shall be a center 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. No A/C vents integrated into console.

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

4.49 INTERIOR DOOR PANELS

The interior of the cab entry doors shall have a 304 brushed stainless steel scuff plate, contoured to the door, from the door sill down.

4.50 REFLECTIVE MATERIAL

The lower portion of the door panels shall include a total 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 and Fluorescent Lime striping shall be Orafol reflexite reflective materials. The reflective decal shall be plainly visible to oncoming traffic when the doors are in the open position.

4.51 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.

4.52 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 door switch for the air horns shall also be provided on the officer's side.

4.53 ALTERNATOR

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.

4.54 FRONT AXLE

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

4.55 REAR AXLE

The rear axle shall be a Meritor™ 14X Tandem drive axle with a capacity of 44,000 lbs. The axles shall be hub piloted, 10 studs, furnished with oil seals.

4.56 INTER-AXLE DIFFERENTIAL LOCK

A locking inter-axle differential shall be provided between the two rear axles. An activation switch shall be provided on the driver’s dash.

4.57 TOP SPEED

Top speed shall be 60 MPH.

4.58 BATTERIES

The battery system shall be a single system consisting of four negative ground, 12 volt Interstate Group 31 MHD batteries, cranking performance of 1100 CCA each with total of 3800 amps, 185 minute reserve capacity with 25 ampere draw at 80 degrees Fahrenheit. Each battery shall have 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 starter motor and alternator.
The battery cables shall be 3/0 gauge. Battery cable terminals shall be soldering 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.

4.59 BATTERY CHARGING

A Kussmaul Auto Charge 1200 battery system charger shall be provided. The Auto Charge 1200 is a fully automatic battery charger with a very high output for vehicles with a single battery system. A remote single bar graph display is provided to indicate the state of charge of the battery system. The rated output shall be 40 amps for the battery system.

A Kussmaul Model 091-55-20-120 super electric auto-eject with weatherproof cover and power interrupt shall be provided.

An 120 volt Auto Pump air compressor shall also be provided to maintain air within the air brake system.

A miniature air filter, that mounts in the output pressure line of the air pump to trap moisture, shall be provided. The micron filter element removes contaminants from the air line. A transparent bowl permits easy monitoring of water collected and a manual purge valve allows the operator to conveniently drain the bowl. A Bendix DV2 heated automatic drain valve shall be provided.

4.60 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.

4.61 BRAKES (Front)

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

If the apparatus empty weight is over 65,000 pounds, the apparatus must have disc brakes front and rear on every axle.

4.62 BRAKES (Rear)
The rear brakes shall be Meritor S-cam style. They shall be 16.5" x 8.625" with heavy-duty return springs, and a double anchor pin design. They shall also have quick-change shoes for fast easy brake relining.

If the apparatus empty weight is over 65,000 pounds, the apparatus must have disc brakes front and rear on every axle.

4.63 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 AD-9 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.

Six (6) 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.

### 4.64 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 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.

### 4.65 ELECTRONIC STABILITY CONTROL SYSTEM

If the apparatus center of gravity meets NFPA standards, then the ESC System is not needed. If the apparatus doesn’t meet mentioned standards, then the apparatus must have ESC along with Side Roll Over Air Bags inside cab.

### 4.66 PAINTED STEEL BUMPER

There shall be a 12" high painted formed steel wrap-around (45 degree) bumper provided at the front of the apparatus. The bumper shall be mounted to a reinforcement plate constructed of 1/4" x 12" x 70" carbon steel. The frame rail extension shall be a reinforced four-sided boxed frame rail for superior safety protection. A gravel shield shall be provided, constructed of .188” aluminum diamond plate. The bumper extension shall be approximately 12” painted red. Rubber bumper pads to match existing fleet.

### 4.67 COOLING SYSTEM

The cooling system must be a minimum of 70 quarts total. NO EXCEPTION
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.

4.68 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.

4.69 CHARGE AIR COOLER

The charge air cooler shall be of a cross-flow design and 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.

4.70 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.

4.71 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.
4.72 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. This robust yet light-weight fan results in less wear and stress on motors and bearings.

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.

4.73 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.

4.74 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.

4.75 DRIVE LINE

The driveline shall consist of Spicer 1810 series dual grease fitting universal joints with "half-round" end yokes. The drive shaft shall be built with a heavy-duty steel tube 4.095" outside diameter x .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.

4.76 ENGINE ENCLOSURE
An integral, formed aluminum and composite engine enclosure shall be provided. The engine enclosure shall be contoured and blended 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. Including all and exposed mounting equipment. Work LED light with switch will be provided under cab area. NO EXCEPTIONS.

4.77 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.

If the apparatus total empty weight is greater than 65,000 pounds, the vehicle must have a Cummins ISX15 with 600 Horse power.

4.78 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.

4.79 AIR COMPRESSOR

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

4.80 STARTER

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

4.81 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. Remote filters must be mounted in an easily accessible location for quick service.

4.82 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 utilizes the DEF fluid, which consists 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 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.

4.83 AFTER TREATMENT SYSTEM

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

4.84 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 is designed to further enhance the engine and operating system by providing early detection of emission-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.

4.85 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 meeting, the requirements of NFPA 1901.

An Air Restriction warning light shall be provided and located on the cab dash.

4.86 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.

**If the apparatus empty weight is over 65,000 pounds, there must also be a transmission retarder included to supply ample braking capacity. NO EXCEPTIONS**

4.87 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 cross contamination. The DEF tank cap shall be blue in color to further prevent cross contamination.
A placard shall accompany fill location noting DEF specifications.

4.88 FRAME

With Apparatus center of gravity being important to safety, chassis rails over 11 inches in total height will not be accepted. NO EXCEPTIONS

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 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.

4.89 FUEL TANK

The chassis shall be equipped with a 65-gallon (minimum) rear mounted, behind the rear axle, rectangular fuel tank that shall be constructed of steel. The fuel tank shall be certified to meet FMVSS 393.67 tests. It shall also maintain engine manufacturer's recommended expansion room of 5%.

There shall be two (2) tank baffles.

Dual pick-up and return ports shall be provided for diesel generators if required.

The fuel tank shall be equipped with a 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 are covered in high temperature rated split plastic loom. Single suction and return fuel lines shall be provided. Rear compartment panel to ensure easy access to fuel system components mounted on tank

4.90 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.
4.91 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 gauges, .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.

4.92 HEAVY DUTY 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 39,000 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 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. (This roof-mounted condenser shall work at full rated capacity at an idle with no engine heat problems.)

4.93 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.
4.94 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.

4.95 LOAD MANAGER

Load manager shall 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 along side 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.

4.96 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.

4.97 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 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.
4.98 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".

4.99 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.

4.100 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

4.101 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. The lid shall 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
- 12V power point (if applicable)

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 as space permits
- 12V power point (if applicable)

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

4.102 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.

4.103 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

Note: (Some engine configurations may also include a fluid warning 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.

4.104 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.

4.105 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. 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. If the option for a mechanical siren has been selected two (2) additional relays shall be provided.

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 (ie: 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.

4.106 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.

4.107 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.

4.108 AUXILIARY POWER POINTS

Three (3) 12-volt 20-ampere auxiliary lighter socket type plug-ins, shall be provided in the cab, two on the center console near the center and one near the officer.

4.109 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.

4.110 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.

4.111 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.

4.112 HALOGEN HEADLIGHTS

There shall be dual beam halogen rectangular headlights in custom housings on each side of the front of the cab.

Headlight alignment shall conform to SAE J599 AUG. 1997

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

4.113 ALTERNATING HEAD LAMP

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

4.114 CORNERING LIGHTS

Two (2) Whelen LED scene/cornering lights shall be mounted on the sides of the bumper, one each side. The lights shall come on steady, with their coordinating turn signal.
4.115 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.

4.116 HAND HELD SPOTLIGHT

One Optronics Blue Eye Model KB-4003, 400,000-candle power hand-held spotlight shall be provided, installed at officer's side of cab.

4.117 LIGHTING CAB INTERIOR

Interior lighting shall be provided inside the front of the cab for passenger safety. Two (2) ceiling mounted combination red/clear LED dome lights with a push button on/off switch in the light lens. 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.

4.118 MAP LIGHT

A Sunnex 20” "goose neck" LED map light shall be provided on the officer's side of the cab dash.

4.119 LIGHTING CREW CAB INTERIOR

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

4.120 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 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.
4.121 HELMET STORAGE

A universal style helmet bracket shall be provided for each riding position.

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

4.122 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.

4.123 DRIVER’S SEAT

The driver's seat shall be a Bostrom Sierra FX air ride high back, adjustable fore/aft, upholstered with gray tweed Durawear. A 3-point seat belt shall be provided.

4.124 OFFICER’S SEAT

The officer's seat shall be a Bostrom Sierra FX air ride Bostrom Tanker 450 ABTS SCBA seat, adjustable fore/aft,. The seat shall be upholstered with gray tweed Durawear. A 3-point seat belt shall be provided.

4.125 CREW SEATS

The crew cab area shall have four (4) Bostrom Firefighter™ seats. The seating arrangement shall be: two (2) rear facing Bostrom Tanker 450 ABTS SCBA seats and two (2) forward facing Bostrom 400CT ABTS SCBA flip up 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

4.126 FLIP UP SEAT

There shall be one (1) spring loaded flip-up seat on the body header at the jump seat area, the opposite side shall have a 45% SCBA holder. Seat shall be supplied with a seat belt.

4.127 SCBA BOTTLE BRACKET
The crew seats shall come equipped with an H.O. Bostrom SecureAll™ SCBA Locking System capable securing all U.S. and international SCBA brands and sizes while in transit or for storage on fire trucks. One an H.O. Bostrom SecureAll™ SCBA Locking System capable securing all U.S. and international SCBA brands and sizes shall be located in the rear cab near the floor level for officers easy access.

Locking shall be achieved by pushing the SCBA unit (bottle) against the pivot arm to engage the automatic lock system. A top clamp shall surround the top of the SCBA tank for a secure fit in all directions. The bracket shall be equipped with a center guide fork to keep the tank in-place for a safe and comfortable fit in seat cavity.

All adjustment points shall utilize one tool and be easily adjustable.

The bracket system shall be free of straps and clamps that may interfere with auxiliary equipment on SCBA units.

The release handle shall be integrated into the seat cushion for quick and easy release and shall eliminate the need for straps or pull cords to interfere with other SCBA equipment.

The bracket system shall meet NFPA 1901 standards and requirements of EN 1846-2.

4.128 CREW SEAT COMPARTMENT

A compartment shall be provided under the forward facing crew seats on the back wall of the cab. The compartment shall be full through, with an access door on each side, accessible from the side of the crew cab doors.

4.129 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. Four (4) turns from lock to lock with an 18” diameter slip resistant rubber covered steering wheel. 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 providing very tight turning ability.

4.130 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. NO EXCEPTIONS.
4.131 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.

This 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. This maintenance free system shall be custom tuned to the apparatus gross weight rating for maximum performance, while maintaining a soft compliant ride. **NO EXCEPTIONS.**

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

4.132 SUSPENSION (REAR) Hendrickson Firemax 48,000 TANDEM AIR RIDE

The rear suspension shall be a Fire Max air ride suspension. Suspension shall have a ground rating of 40,000 pounds or greater.

4.133 TIRE PRESSURE MONITOR

A Doran tire pressure sensor shall be provided for each wheel with heads up monitor mounted inside the cab. The pressure sensor shall indicate if a particular tire is not properly inflated. A total of ten (10) indicators shall be provided.

4.134 FRONT TIRE

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.

4.135 FRONT HUB COVERS

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

4.136 REAR HUB COVERS

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

4.137 REAR TIRES

Rear tires shall be Michelin 11R22.5, load range H, XZE highway tread, dual tubeless type with a GAWR of 48,000 pounds. Wheels shall be disc type, hub piloted 22.5 x 8.25 10 stud with 11.25" bolt circle. Chrome plated lug nut caps shall be provided.

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

4.139 WHEELS

The front and rear wheels shall be ACCURIDE® brand aluminum.

4.140 TOW EYES (Front)

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

4.141 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.

4.142 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 is 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.

<table>
<thead>
<tr>
<th>Ratings:</th>
<th>Max Input (HP)</th>
<th>600</th>
</tr>
</thead>
<tbody>
<tr>
<td>Max Input (Torque)</td>
<td>1850 (lb ft)</td>
<td></td>
</tr>
<tr>
<td>Max Turbine (Torque)</td>
<td>2600 (lb ft)</td>
<td></td>
</tr>
</tbody>
</table>

| 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 |

**If the total empty weight of the vehicle is over 65,000 pounds, the apparatus must have a transmission retarder included for ample braking capacity.
4.143 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 an aluminum housing and mounted to the outside of the officer’s side frame rail for accessibility and ease of service.

4.144 TRANSMISSION FLUID

The transmission shall come filled with Castrol TranSynd™ Synthetic Transmission Fluid or approved equal meeting the Allison TES-295 specification. NO EXCEPTION.

4.145 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. Ensure that mounting bolts are protected for heat under cab.

4.146 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.

4.147 WHEELBASE

The wheelbase shall be 236".

A wheel base over 236 is not desired.

4.148 WINDSHIELD WIPERS

Two (2) black anodized finish two speed synchronized electric windshield wiper system. Dual motors with positive parking. System includes large dual arm wipers with built in washer system. One (1) master control works the wiper, washer and intermittent wipe features. Washer bottle is a remote fill with a 4 quart capacity. Washer fill is located just inside of officer cab door.

4.149 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.

4.150 FIRE PUMP HALE QMAX-200

Fire pump shall be 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 to 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 in the gear box and they 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.

4.151 PUMP TRANSFER CASE
The drive unit shall be designed of ample capacity for lubricating reserve and to maintain the proper operating temperature. 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.

4.152 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.

4.153 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.

4.154 THREAD TERMINATION

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

4.155 PRESSURE GOVERNOR

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 the menu structure.

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

4.156 INTAKE RELIEF

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

4.157 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.

4.158 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.

4.159 VALVE WARRANTY

The valves shall carry a 10-year warranty.

4.160 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.

4.161 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 complete with removable strainer and long handle chrome-plated cap.

4.162 2.5" RIGHT SIDE INLET

One 2.5” gated inlet valve shall be provided on the right 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.

4.163 2.5" 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.

4.164 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.

4.165 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.

4.166 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.

4.167 2-1/2” RIGHT SIDE DISCHARGES

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.

4.168 4” OUTLET

A Hale Maxflow 4” electric valve shall be provided on the right side pump panel. The valve shall be controlled at the pump operator's panel. A manual override wheel type valve handle must be installed on the right side pump panel.

4.169 CROSSLAYS

Two (2) crosslay hose beds shall be supplied. The piping and valves shall be 2", the swivel shall be 1.5". The valves shall be the "drop-out" style, push/pull controlled from the pump panel.

Each compartment shall hold 200 ft. of 1.75" double jacket hose. Both beds shall be of the same dimension.

4.170 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.

4.171 TANK FILL

A 1.5" tank fill shall be provided, using a quarter turn full flow ball valve controlled from the pump operator's panel.

4.172 PUMP AND GAUGE PANELS

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

Pump panels on both sides shall be easily removable. The gauge and control panels shall be two separate panels for ease of maintenance.
4.173 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. Where possible, horizontally operated swing type locking handles shall be used for 2-1/2” and larger discharges. Horizontally operated swing handles shall be required to provide better leverage as valves wear and become more difficult to open and close. The smaller valves shall be controlled by pull type locking handles.

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.

4.174 ESCUTCHEON PLATES

The pump panel shall be equipped with color-coded removable escutcheon plates around the suction and discharge valves.

4.175 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
#3 Discharge – Navy Blue
#4 Discharge - Black
#5 Discharge - Green
#1 Pre-Connect - Orange
#2 Pre-Connect - Red
#3 Pre-Connect - Brown
#4 Pre-Connect - Magenta
Front Bumper Line - Turquoise
Large Diameter Discharge – Yellow With White Border
Left Hose Bed Pre-Connect - Tan
Right Hose Bed Pre-Connect - Lavender
Left Rear Discharge - Olive
Right Rear Discharge – Light Blue
Deck Gun – Silver
Inlets – Burgundy
Tank fill Lime Green
Tank to Pump - Burgundy

4.176 RUNNING BOARD TROUGH
A trough shall be provided in the right side running board. Velcro straps shall be provided to secure the hose.

4.177 PUMP PANEL LIGHTS

The pump panel controls and gauges shall be illuminated by a minimum of two (2) LED lights.

A LED light shall be provided for the opposite side pump panel.

4.178 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.

4.179 AIR HORN BUTTON

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

4.180 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.

4.181 4" MASTER GAUGES

NoShok liquid filled pump pressure and vacuum gauges shall be provided. The gauges shall be 4" in diameter with white faces and black lettering. The gauges shall have a pressure range of 30"-0-400 psi.

4.182 2.5" PRESSURE GAUGES
NoShok liquid filled individual line pressure gauges shall be provided. The gauges shall be 2.5" in diameter with white faces and black lettering. The gauges shall have a pressure range of 0-400 psi.

4.183 WATER TANK GAUGE

An Innovative Controls weather proof encapsulated (14) super bright LED light indicator shall monitor the water tank level and shall be mounted on the pump operator's panel. The fourteen LED lights are arranged in a "V" pattern for easy identification of liquid level. When the liquid level reaches less than a 1/4 full the refill level begins to flash. The tank-sensing probe shall be chemical resistant PVC with stainless steel sensing wires. The cover plate shall be aluminum sub-plate, black background and blue graphics, with an outdoor exposure rated composite overlay.

4.184 AERIAL BODY SUB-FRAME

The chassis shall be fitted with a sub-frame system consisting of a series of stainless steel plate gusseted legs, extending down and out from the chassis frame rails on each side. This system shall provide additional structural support to the running boards and side compartments. A heavy-duty rear platform shall be constructed of the mild steel to support the rear compartments. The entire assembly shall be attached to the chassis frame by a series of heavy-duty U-bolts. Self-supporting bodies shall not be acceptable. NO EXCEPTIONS

4.185 BODY CONSTRUCTION

All side metal, compartments and compartment floors shall be of bolted stainless steel. The body shall be mounted on heavy-duty 3" steel channel sills with bracing for extreme rigidity. NO EXCEPTIONS

The compartment body, pump housing and the engine compartment shall be separate modules (segmented body design) that are not to be fastened together in any manner in order to provide "flex joints" to alleviate stress and cracking of body compartments and running boards.

Compartments shall extend from the front jacks to the tailgate of the apparatus and shall be recessed to the frame of the apparatus where possible.

Each compartment shall have drain holes for the release of moisture. Each compartment shall be properly vented with louvers. Compartments shall have sweep-out flooring (no obstruction at the floor bottom).

4.186 REAR COMPARTMENT

A compartment will be provided in the rear of the truck. The compartment will be a minimum of 16" yet wide as possible x 30" high and full length of the hose bed. This
compartment will have a 1,000 pound 100% roll out tray with mounting plates supplied to mount equipment on. This compartment will be fully enclosed with a hinged door and warning light switch for open door warning. **NO EXCEPTION**

4.187 REAR COMPARTMENT BELOW HOSE BED

There shall be a compartment below the hose, between the frame rails, approximately 25-1/2" wide x 14-1/2" high with a lower section 72" deep and an upper section 88-3/4" deep designed to hold a stokes basket.

4.188 COMPARTMENTATION LEFT SIDE

L1- Below the turntable there shall be a compartment approximately 26-5/8" wide x 34-3/8" high x 26-1/2" deep. Compartment height is 12" below the hydraulic controls.

L2,L3 There shall be two compartments above the rear wheels approximately 57-3/4" wide x 18-1/8" high x 26-1/2" deep. The compartments shall have lift up pan type doors, equipped with “D” ring latch and a gas door stays.

L4- There shall be a compartment behind the rear wheels approximately 37-3/4" wide x 48-1/2" high x 26-1/2" deep.

L5- There shall be a second compartment behind rear wheels approximately 47-3/4" wide x 48-1/2" high x 26-1/2" deep.

L6- There shall be a third compartment behind rear wheels approximately 18-3/4" wide x 40-1/2" high x 26-1/2" deep.

4.189 COMPARTMENTATION RIGHT SIDE

R1- Below the turntable there shall be a compartment approximately 42" wide x 34-1/4" high x 26-1/2" deep. The lower portion shall be 10" deep. There shall be a 10" high x 17" deep x 42" wide notch in the lower rear portion of the compartment to accommodate the apparatus exhaust system.

R2,R3-There shall be two compartments above the rear wheels approximately 57-3/4" wide x 18-1/8" high x 26-1/2" deep. The compartments shall have lift up pan type doors, equipped with “D” ring latch and a gas door stays.

R4- There shall be a compartment behind the rear wheels approximately 37-3/4" wide x 48-1/2" high x 26-1/2" deep.

R5- There shall be a second compartment behind rear wheels approximately 47-3/4" wide x 48-1/2" high x 26-1/2" deep.
R6- There shall be a third compartment behind rear wheels approximately 18-3/4" wide x 40-1/2" high x 26-1/2" deep.

It is understood that each manufacturer may build the body slightly different in dimensions. These mentioned are required minimums. Each body proposed must have a minimum of 365 cubic feet of compartment space to be considered. NO EXCEPTIONS

4.190 ROLL-UP COMPARTMENT DOORS

The apparatus body shall be equipped with R.O.M Robinson Shutter doors where not stated otherwise. The door slats shall be double wall box frame, manufactured from anodized aluminum. The doors shall have the following features:

- Manufactured wholly in the United States.
- Concave individual slat design to prevent loose equipment from hindering door operation.
- Co-Extruded stretch resistant inner seal between slats to prevent metal-to-metal contact and inhibit moisture and dust penetration.
- Interlocking swaged/dimpled end shoes shall be utilized to provide a tight fitting assembly and allow for easy removal in the event of damage.
- Effective counter balancing for ease of lifting and lowering the doors.
- One-piece side rail and track to provide and unobstructed slide area and reduce the risk of binding.
- Non-abrasive replaceable water and dust barrier to keep compartment equipment clean and dry.
- A magnetic type switch integral to the door shall be supplied for door ajar indication and compartment light activation.
- A full width positive latch bar shall be operable with one hand, even with heavy gloves.
- Keyed door locks on each door keyed alike

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

4.191 PAINTED ROLL-UP DOORS

The doors shall be wet painted before assembly by the door manufacturer. The paint shall be the same as the apparatus to achieve an exact match of paint color and have the look and durability same as on the rest of the truck.

4.192 ROLL UP DOOR DRIP PAN/SPASHGUARD

Each roller shutter door shall be equipped with a drip pan with built in splashguard. The drip pan shall attach to the pennant plate with spring pins to allow for easy removal and cleaning. The construction of the pan shall be a corrosion resistant extruded and injection molded high impact styrene.
4.193 SCBA CYLINDER COMPARTMENTS

There shall be seven (7) spare breathing air cylinder compartments recessed in the rear fender wells, three (3) left and four (4) right. The compartments shall have brushed stainless doors with 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.

4.194 COMPARTMENT MATTING

Turtle Tile interlock matting material shall be provided in each compartment.

4.195 WHEEL LINERS

Fiberglass fully radiused wheel well liners with adequate support to maintain their rigidity through adverse weather conditions shall be provided.

4.196 ADJUSTABLE SHELF

There shall be (10) adjustable shelves provided and installed in the compartments. The shelves shall be fabricated of .188” aluminum plate.

4.197 COMPARTMENT DIVIDER

There shall be a vertical divider/partition provided in a compartment as specified. The divider shall be constructed of .188” thick smooth aluminum plate. The top and bottom of the divider shall have a formed flange bolted to the interior of the compartment.

4.198 ADJUSTABLE VERTICAL SLIDE-OUT PANEL

There shall be an adjustable vertical slide-out tool board with a 500 lb. capacity supplied and mounted on unistrut tracks. Extra compartment lights shall be provided and located as needed to properly illuminate the compartment.

4.199 600# SLIDE-MASTER TRAY

There shall be (3) Slide-Master pullout drawers provided and installed. The drawers shall have a distributed load capacity of 600 lbs. and be capable of extending 70% of its depth. The tray shall be fabricated of .188” aluminum plate and have a formed lip that measures 2”.

4.200 SLIDE-MASTER TRAY
There shall be (2) Slide-Master pullout drawers provided and installed in the rear compartment. The drawer shall have a distributed load capacity of 1,000 lbs. and be capable of extending 100% of its depth. The tray shall be fabricated of .188" aluminum plate and measure approximately 68" deep x 20" wide with 9" sides and a 4" front lip.

4.201 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.

4.202 HOSE BED

The rear hose bed area shall be completely wide open to allow for quick and easy loading and unloading of hose thus preventing hose and hose couplings from being caught or tangled.

Rear opening of the rear hose bed shall be a minimum of 21" wide x 28" high. Any rear hose bed opening(s) requiring hose chutes shall not be acceptable.

Hose bed flooring shall be removable slatted aluminum.

4.203 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.

4.204 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 two (2) handrail on each side of the access steps to the ladder. These handrails are covered with ribbed rubber to prevent hand slipping when climbing the steps.

4.205 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.

4.206 RUB RAILS

The body shall be equipped with heavy extruded aluminum rub rails at the sides. Rub rails 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.

4.207 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:

1. Skirting around front bumper.
2. The step at the cab entrance.
3. The jump seat steps.
4. The running boards.
5. The rear step. (45 degree corners)
6. The top of the compartments.

4.208 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. This material shall be a non-corrosive stress relieved copolymer thermo-plastic. The booster tank shall be of a specific configuration and is 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 is 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 interlock with one another and are 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 allows 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.

4.209 MASTER ELECTRICAL PANEL

The main breaker panel shall be wired through the master disconnect solenoid and controlled with a three-position ignition rocker switch. Circuit breakers and flashers shall be located at officer's right side lower interior firewall with removable cover and schematic provided with notebook holder on outside cover.

A deluxe breaker panel with up to 22 ground switched relays with circuit breaker protection shall be provided.

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 and one (1) 70-ampere relay for cab lightbar and assemblies shall be provided. If the option for a mechanical siren has been selected two (2) additional relays shall be provided.

Additional four relay boards with circuit breaker protection for additional loads. Maximum two boards (8 relays) per breaker panel. All relay boards set up to trip with input from switch of positive-negative or load manager by moving connector on board (no tools needed to do this).

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 23 additional automatic reset circuit breakers for non-switched loads that are remotely switched (ie: heater fans, hood lights, etc.).

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.

4.210 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 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 are 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 are function oriented. The first is to control major truck function and the second controls overhead switching and interior operations. Each module is single function coded and labeled to aid in troubleshooting. The centers also 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 is 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 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 has a minimum rating of 289 degree Fahrenheit.

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

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

4.211 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.

4.212 COMMUNICATIONS SYSTEM

A Firecom 3010R single radio intercom shall be provided. The system shall service the eight (8) cab seat positions. The driver and officer shall have UHW-10 headsets with
radio transmit capabilities. The six crew seats shall have UHW-20 headsets with intercom only capabilities.

The system components shall be as follows:

1. 3010R intercom master station
2. UHW-10 headsets with charger and base station #107-3092-00
6. UHW-20 headsets with charger #105-3093-00
2. Multiple channel wireless base #106-3086-00
1. Radio interface cable as required
8. Headset hooks #HGR-1

4.213 COMPARTMENT LIGHTING

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

Provisions shall be made for the installation of customer furnished radio.

4.214 LICENSE PLATE BRACKET

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

4.215 REAR VISION CAMERA SYSTEM

Provided and mounted on the apparatus shall be a Safety Vision SV-CLCD-70 camera kit. The system shall consist of one (1) cab mounted model SV-LCD70 7” LCD monitor, one (1) model SV-620 (Color) high resolution 1/3” CCD camera, one (1) SV-LCD70-CBQKIT Control Box, and one (1) SV-523 65’ camera cable. The monitor shall be dash mounted in plain view of the driver. The kit is capable of having three (3) additional cameras installed for a total of four (4).

4.216 HD STEREO

A Jensen HD Stereo AM/FM/WB/CD shall be provided.

4.217 TAIL/STOP/TURN/BACKUP LIGHTS

The taillights are to be Whelen 600 LED style. The brake/tail lights to be red and exceed SAE requirements. The turn signal shall be populated in an arrow pattern, amber in color. The backup lights shall also be LED. One opening shall be open to accept a 600 series warning light.

4.218 LED ICC/MARKER LIGHTS
4.219 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.

4.220 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.

4.221 WORK LIGHTS

There shall be two (2) Unity brand AG 6” chrome plated sealed beam flood lights provided. The lights shall be securely mounted at the upper rear of the apparatus body. Each light shall be supplied with individual switches.

4.222 SCENE LIGHTS

A pair of Whelen M9 LED scenelights shall be installed.

4.223 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.

4.224 UPPER LEVEL WARNING DEVICES

The upper level is divided into zones A, B, C and D and the approved lighting package to be provided shall be as follows:
Zone A (front) shall have one (1) Whelen Model FN72QLED 12 LED Freedom Series 72” Lightbar.

Zone B (right side) shall be covered by the module from the lightbar and the right rear stanchion beacon.

Zone C (rear) shall have two (2) Whelen Model MCFLED2R Micro Edge Freedom LED light bars mounted on the rear stanchions and two (2) Whelen Model 60A00FAA amber LED, mounted at upper rear of apparatus.

Zone D (left side) shall be covered by the module from the lightbar and the left rear stanchion beacon.

4.225 TRAFFIC ADVISOR

A Whelen LED TAL852 Traffic Advisor with a TACTRL1 Control Head shall be provided. This unit shall be of the two-piece design. Each section shall be approximately 1-1/2” high x 2-1/2” deep x 22” long. Each section shall have a four (4) LED lamp group, and shall be in a cap style extruded aluminum housing with black powder painted finish, and surface mounted on each side of the hosbed at the top of the rear body panel.

The high intensity LED's are rated for over 100,000 hours of operation and have extremely low current consumption. The Control Head has a four function rotary switch for selection of: center to left, center to right, center to left and right, or flash patterns. The dip switch on the rear panel selects the choice of eight (8) different programmable flash patterns. The Control Head features a visual LED status display.

The control head shall be mounted within easy reach of the driver or officer.

4.226 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 (front) shall have a stainless steel warning light housing each side with Two (2) Whelen 600 Super LED red lights mounted in the front of each housing. The inboard pair of lights is in addition to the minimum NFPA warning system and shall be wired through a load-shedding device.

Zone B (right side) shall have four (4) Whelen 600 Series Super LED red lights mounted one on the side of the headlight housing, one at the middle of the apparatus, one on the body side at rear of apparatus, and one on the side of the aerial device.

Zone C (rear) shall have two (2) Whelen 600 Series Super LED, red lights mounted one each side of the rear of the apparatus.
Zone D (left side) shall have four (4) Whelen 600 Series Super LED, red lights mounted one on the end of the headlight housing, one at the middle of the apparatus, one on the body side at rear of apparatus and one on the side of the aerial device.

4.227 WARNING LIGHT, ROTO-RAY, LED

There shall be one LED Roto-Ray warning light mounted on the front of the cab below the windshield. The Roto-Ray shall contain three (3) independent LED lights, one (1) white and two (2) red. The lights shall be mounted in a motorized housing and shall be activated by a switch in the cab. The light shall be wired to the parking brake to deactivate when the parking brake has been depressed.

4.228 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. No foot switch mounted in apparatus. Siren switches will be mounted in the center console on officer`s side.

4.229 SCREAMING EAGLE SIREN

There shall be a Screaming Eagle 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. Switches to operate this will be located in the center console on the officers side of apparatus.

4.230 LOW FREQUENCY TONE SIREN

A Whelen Howler low frequency tone siren and speaker system shall be installed on the apparatus. The system shall come with two (2) speakers mounted under the front of the apparatus and an amplifier. The Howler shall be interfaced into the primary electronic siren with a control switch on the cab dash near officer.

4.231 SIREN SPEAKER

One Whelen cast weatherproof siren speaker shall be provided, mounted behind the bumper.

4.232 GENERATOR
The apparatus shall be equipped with a complete electrical power generation system. A Smart Power hydraulic 10.0 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 that the apparatus engine is running and meeting the minimum range of 950 RPM’s.

4.233 120-VOLT OUTLET

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

4.234 240-VOLT OUTLET

A 240-volt outlet with weatherproof cover shall be provided. All 240 volt wiring shall be installed in liquid tight conduit.

4.235 BREAKER BOX

A circuit breaker box shall be provided with eight (8) spaces for breakers which shall be provided as needed. All wiring shall be installed in liquid tight conduit.

4.236 WHELEN PIONEER PLUS LED BROW LIGHT

A Whelen model PFP2 LED brow light shall be provided. The light shall be mounted at the front of the cab.

The light shall be controlled from a switch in the cab.

4.237 WHELEN PIONEER PLUS LED SCENE LIGHT (cab)

Two (2) Whelen model PFP2 LED scene lights shall be provided with PBA203 flush mount brackets. The lights shall be flush mounted, one each side, in the raised roof portion of the cab.

The lights shall be individually controlled from a switch in the cab.

4.238 LED LIGHT WHELEN PIONEER

A Whelen Model PFP2 Pioneer Plus Dual Panel LED floodlight shall be provided. The light shall be housed in a heavy-duty aluminum housing.
Lumens: 10,000
Amps: 13
Volts: 12.8 DC
Bulb Type: LED
Width: 14”
Height: 4-5/8”
Depth: 3”

The light shall be fixed mounted on a KR-SB-600 mount. A switch shall be located at the light head.

4.239 LED LIGHT WHELEN PIONEER

A Whelen Model PFP2 Pioneer Plus Dual Panel LED floodlight shall be provided. The light shall be housed in a heavy-duty aluminum housing.

Lumens: 10,000
Amps: 13
Volts: 12.8 DC
Bulb Type: LED
Width: 14”
Height: 4-5/8”
Depth: 3”

The light shall be mounted on a telescoping pole. A switch shall be located at the light head.

4.240 CORD REEL

There shall be a Hannay Model ECR1616-17-18 electric rewind cable reel furnished and mounted in a compartment. 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.

4.241 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.

4.242 FOUR-WAY RECEPTACLE MOUNTING

The four-way receptacle box shall be mounted on a compartment wall or shelf.
4.243 GROUND LADDERS

The apparatus shall be equipped with 115’ of 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. Removable plated steel butt spurs shall be utilized for added strength. A full 1/2", non-rotting, poly rope shall be provided for easy ladder operation.

ALCO-LITE LADDERS

One (1) 10 ft. folding ladder, (mounted in fly section)

One (1) 14 ft. combination ladder

Two (2) 16 ft. roof ladders

One (1) 24 ft. 2-section extension ladder

One (1) 35 ft. 3-section extension ladder

The ladders shall have lifetime Warranty against manufacturing defects.

PIKE POLE

Two (2) 4-foot Duo-Safety fiberglass pike pole shall be provided and mounted.

PIKE POLE

One (1) 6-foot Duo-Safety fiberglass pike pole shall be provided and mounted.

PIKE POLE

One (1) 8-foot Duo-Safety fiberglass pike pole shall be provided and mounted.

PIKE POLE

One (1) 10-foot Duo-Safety fiberglass pike pole shall be provided and mounted.

PIKE POLE

One (1) 12-foot Duo-Safety fiberglass pike pole shall be provided and mounted.

FOLDING LADDER

There shall be a 10 ft. Duo-Safety 585A series folding attic ladder with mounting.
4.244 LADDER ENCLOSURE

The extension ladders, and one roof ladders shall be stored within a weather proof enclosed area on the officer’s side of the hosebed. The ladders shall be mounted on non-metallic slides so each ladder can be removed individually. All ladders shall be stored on beam if possible. A vertically hinged treadplate door shall enclose the ladders on the rear.

Additionally a 16’ roof ladder shall be stored on the right side body compartment top, and a 14’ combination ladder shall be mounted on the left side body compartment top.

4.245 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 manufacture 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. Were the primer has been broken during the frame assembly process the area shall be touch up to reestablish the seal. Prior to finish paint 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.

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 if 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 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 were possible for mounting trim to the body or cab.

If a pre-treated screw or bolt is not available, hand apply Dynatex Boltlocker or Threadlocker 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 dissimilar 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 preconditioned to the operating temperature of 35ºC and fogging a 5% salt solution at the specified rate. The fog collection rate is 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 placed at a 15-30 degree angle from vertical or tested in the “installed” position. This orientation allows the condensation to run down the specimens and minimizes 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.
4.246 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. “No Exception”

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. The chassis, compartment doors, front and rear jack panels, and rear fender panels 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:**
1. Wash surface thoroughly with mild detergent.
2. Clean and de-grease with Prep-Sol 3812S.
3. Sand and feather edge using 400 grit or finer on a dual action sander.
4. Remove sanding dust with a cleaner compatible with polyurethane base coat/clear coat final finish.

**Substrate treatment:**
1. Use a Metal Conditioner followed with a Conversion Coating product.

**Priming:**
1. Use a priming 615S pretreatment.
2. Use a self etching primer applied to achieve a 1.5 mil dft minimum.
3. Use Prime N Seal sealer compatible with polyurethane base coat.

**Color Coat:**
1. Apply polyurethane base coat 1-2 mil dft minimum.
Clear coat:
1. Apply polyurethane clear coat 2 mil dft minimum.

4.247 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.

4.248 TURNTABLE PAINT

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

4.249 PAINTED FRAME

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

4.250 LETTERING AND STRIPING MATERIAL

All lettering and striping material must be Orafol reflective material meeting NFPA and OSHA.

4.251 LETTERING

Forty (40) 3" Gold reflective letters, with left hand shading and right hand outline to equal 3-5/8" letter, shall be provided.

4.252 STRIPING

A 6" Reflective stripe shall be provided across the front of the cab and along each side of the apparatus. One 1” gold strip separated by 1” spacing shall be placed on top and bottom of the white 6” Reflective stripe everywhere the white stripe exist.

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.

4.253 STRIPING, CHEVRON STYLE, REAR COMPARTMENT DOOR

The apparatus shall have 6” red and yellow reflective Chevron style striping affixed to the rear compartment door. 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.
4.254 BOOM SIGN

A boom sign, approximately 87" x 10", shall be provided on each side of the boom. The background of the boom sign shall be painted primary truck color.

4.255 BOOM SIGN LETTERING

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

4.256 MISCELLANEOUS EQUIPMENT FURNISHED

1 pt. touch-up paint

Pike pole tubes shall be provided, three each side of the rear compartment.

4.257 WHEEL CHOCKS

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

4.258 AERIAL LADDER DEVICE

An aerial ladder device with a minimum 100-foot vertical reach shall be provided. The height dimension shall be calculated with the boom at 80 degrees. The horizontal reach of the device shall not be less than 93 feet, 6 inches. **The overall height of the apparatus with the aerial device in the bedded positions shall be no more than 10 feet, 1 inches and the overall length of vehicle shall be not more than 43 feet, 6 inches.**

*Overall height and length are important for maneuverability and placement of apparatus in the facilities.*

4.259 TElescoping AERIAL

An elevated ladder of the telescopic design consisting of a minimum of five sections shall be provided. The overall length of the aerial with all five sections fully retracted at 0 degree elevation shall not exceed 29 feet.

The aerial is required to have not less than 5 sections so the boom is compact while operating in our down town area. **NO EXCEPTIONS**

These particular shorter lengths shall be important for allowing the ladder to be positioned in tight or confined spaces associated with lower degrees of elevation. All sections shall be of the open lattice, non-crossing type construction to obtain lightweight
and stability at full horizontal reach. The telescoping sections shall be constructed from heat-treated 6061-T6 aluminum alloy material fastened by Aircraft Huck bolts to provide superior strength thus eliminating cracking of welds in strategic structural areas. There shall be no welding on the ladder so as not to lower the yield strength of the material and cause torsional fracture, grain distortions and unequal conductivity. The base section shall also consist of two heavy-duty steel side plates; one mounted each side of the ladder. The steel side plates shall be aircraft Huck bolted into place and shall function to tie the ladder, turntable, and lift cylinders together. There shall be trailing beams attached to the side plates that shall function to position and anchor lift cylinders into place and to distribute shock loads imposed by water hammer and hose breakage.

The ladder rungs shall be constructed form a solid extrusion and shall have an oval seriated profile. The rungs shall be spaced on 14 in. (356-mm) centers and shall have a minimum outside diameter of 1-1/4 in. (32-mm) including the surface. The minimum design load per rung shall be 500 lb (227 kg) distributed over a 3 1/2 in. (89-mm) wide area at the center of the length of the rung with the rung oriented in its weakest position.

Top rails shall be provided on the ladder, shall have a minimum width of 1 in. (25 mm), and shall be at a minimum height of 17 in. (305 mm) above the centerline of the rungs.

Two folding steps with skid-resistant surfaces shall be provided on the ladder for the use of the waterway-monitor operator. Each folding step shall have a minimum design load of 500 lb (227 kg) and shall be a minimum of 35 sq in. (22582 mm²) in area. A single step that has a minimum design load of 500 lb (227 kg) and a minimum area of 100 sq in. (64516 mm²) may be used in place of the 2 steps.

The rated horizontal reach of an aerial ladder shall be measured in a horizontal plane from the center line of the turntable rotation to the center line of the outermost rung on the fly section with the aerial ladder extended to its maximum horizontal reach.

The ladder shall be left in a natural aluminum finish and painting the ladder shall not be acceptable.

The ladder shall have the capability to shed massive ice buildup during freezing conditions.

4.260 AERIAL EGRESS SECTION

A bolt-on removable egress shall be installed on the tip of the fly section. The rungs on the egress shall be on a plane of 20 degrees to provide a smoother transition onto the ladder when it is at a high angle.

4.261 LOAD LIMITATIONS

Load instruction plates shall be located at the turntable pedestal control station, indicating the recommended safe load of the ladder. The ladder 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.

THE LADDER SHALL HAVE A CAPACITY OF 750 LBS. DRY AND 500 LBS. WHILE FLOWING WATER. ALL LIMITATIONS MUST HAVE A 3:1 STRUCTURAL SAFETY FACTOR ASSOCIATED, NO EXCEPTIONS

ADDITIONAL INFORMATION. Ladder shall be capable of being rotated in any direction and the ladder capable of being raised or lowered ---ALL AT THE SAME TIME.

4.262 RAISING AND LOWERING

The raising and lowering mechanism shall consist of two large hydraulic cylinders approximately seven inches in diameter attached to the ladder so that 50% of the lifting force effort is applied towards raising the ladder and it shall raise the complete load, 750 lbs., with ladder at full horizontal reach with less than 1500 psi. hydraulic pressure. Cylinders shall be mounted so that the cylinder rods are attached to trailing beams of the ladder steel side plates.

The power operated raising and lowering cylinders shall provide movement of the ladder to be rapid, smooth and without undue sway or vibration. A positive locking device shall be provided so that 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 ladder unit should 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. Provisions shall be made to prevent damage at full raise or lowering.

4.263 EXTENSION AND RETRACTION

The ladder shall be extended by dual hydraulic rams mounted inside the bottom of the base section. The cylinders shall be mounted in the base section and supported through the middle to accommodate the load stress(s) of the ladder.

The hydraulic cylinders shall extend the second section in a manner so that both cylinders hydraulically equalize and provide the additional safety feature of a double extension system. The third and fourth sections shall be connected to the second section of the ladder by two aircraft cables. This design feature shall eliminate the extra weight of hydraulic cylinders on the third and fourth sections should they be horizontally extended to the side of the apparatus.
The design shall be such that the operation hydraulic pressures of the main system shall be as low as possible. Once again, as a safeguard feature, the system shall be structurally and hydraulically designed and mounted to prevent rapid descent (retraction) of the ladder unit should 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 or danger to personnel. Provisions shall be made to prevent damage at full extension and retraction.

All sections of the ladder shall extend and retract (slide) on special polymer slide blocks. Each slide block shall be bolted into place and shall be removable for inspection and maintenance. There shall be slide blocks throughout the four sections of the ladder for proper alignment and stability.

4.264 HYDRAULIC SYSTEM

A flange mounted hydraulic pump, which shall be driven by a power take off unit that is connected to the chassis transmission to provide the power required for operating the ladder. A PTO hour meter shall be provided to record the time when the aerial hydraulic system is engaged.

Said hydraulic system shall have a minimum hydraulic reserve for sixty-five gallons of special hydraulic fluid. The hydraulic tank shall be located directly next to the diesel fuel tank and shall be equipped with a hinged tread plate cover for ease of accessibility and maintenance. The hydraulic fluid shall be discharged through a refined filter, plus fine mesh stainless steel strainers.

Within said system, pilot operated check valves shall be incorporated so that all valves shall hold in their respective function(s). The hydraulic system shall also incorporate automatic bypasses to compensate in case the ladder is forced into a building or should operator accidentally throw control valve in opposite direction at full speed.

The hydraulic system shall provide coast in the lift cylinders to prevent the stabilizer jack system from coming off the ground. This shall be accomplished through an accumulator filled with liquid nitrogen mounted on the turntable which shall absorb the hydraulic oil from the lift cylinders should the ladder be stopped suddenly when being lowered.

Intercooling of the hydraulic oil shall be accomplished through a built-in heat exchanger to cool oil at all times when fire pump is in operation.

All hydraulic lines shall be of the double braided type with synthetic cover rated at 10,000 lb. burst pressure or above.

A means shall be provided for readily checking and filling the hydraulic reservoir. The fill location shall be conspicuously marked "Hydraulic Oil Only." The manufacturer shall provide proper instructions for checking and filling the hydraulic reservoir.
4.265 AUXILIARY HYDRAULIC POWER

A 12-volt auxiliary pump shall be provided to supply emergency power to the hydraulic system. This system shall be operated off the truck batteries and provide limited adequate power to operate the ladder and stabilizer jacks under emergency conditions.

The auxiliary hydraulic motor shall be located in the stabilizer control station compartment on the left side of the vehicle, next to the jump seat entrance for ease of accessibility and maintenance.

4.266 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.

A power operated governed engine speed control shall be provided to power the aerial device at normal operating speeds as determined by the manufacturer and this standard.

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.

When the unit is equipped with a fire or attack pump, the governed speed control shall be automatically disengaged when the fire or attack pump is operating.

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.

4.267 LOWER TURNTABLE SUPPORT ASSEMBLY

The mainframe assembly shall be mounted midship on the chassis, forward of the pump and over the transmission. This shall leave the rear hose bed open for use of large diameter and regular fire hose.

The main frame assembly shall be a solid welded steel box beam structure with welded support gussets fore and aft extending across the chassis frame 35” x 50” in depth. The solid steel box beam structure measurements are important to take shock loads imposed by water turret operation and to give a reserve strength factor to compensate for hose breakage and water hammer.

The overall height of the mainframe assembly measured from ground level to the turntable assembly shall not exceed five feet. This is important in order to keep the center of gravity as low as possible, thus giving the truck superior handling.
characteristics. An open tube or angle substructure for the mainframe assembly shall not be acceptable.

The mainframe assembly base plate, located at the top of the assembly, which supports and holds the turntable rotation bearing, shall be minimum 1" steel. There shall be a minimum of two solid one inch by three-inch tension and compression bars mounted underneath, fore and aft, of the mainframe assembly, which shall tie the ladder and chassis together. The bars shall function to withstand vertical torsional loads. The forward tension and compression bar shall be attached from the rear area of the front spring suspension hanger to the underside area of the mainframe assembly. The rear tension and compression bar shall be attached from the forward area of the rear spring suspension hanger to the under side area of the mainframe assembly.

4.268 TURNTABLE

The turntable shall be a minimum of one-inch thick plate and ninety-four (94) inches in diameter. The side plates to which the main base section of the aerial ladder is connected shall have a minimum height of two feet and shall include gussets that shall tolerate the side thrust and tremendous forces to which the unit shall be subject. The turntable shall be equipped with two removable steel sections for access into the pump.

The turntable side plates shall be positioned at a 45-degree angle (opposite the angle of the raise/lower cylinders) to act as a partial counter balance weight on the opposite side of the truck from the ladder extension.

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.

Turntables using hydraulic clutch (disc) brake rotating mechanisms to hold the ladder and turntable in a neutral position shall not be acceptable.

The power-operated turntable shall provide continuous rotation of the ladder 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 ladder sections in any direction 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 ladder 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 an emergency means of retracting the ladder and an auxiliary bleed down valve for the hydraulic raise/lower cylinders.
There shall be a minimum of two heavy-duty steel shafts that shall attach the base section of the ladder (at the top and very back) of the ladder to the top portion of the turntable side plates together. The minimum steel shaft measurement shall be 34” long X 3” 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 and the ladder station.

The turntable rotation mechanism shall be provided with an automatically applied brake or self-locking drive. It shall provide braking capacity with all power systems non-functioning to prevent turntable rotation under all rated conditions of loading.

4.269 TURNTABLE BEARING

The turntable bearing shall be constructed of steel. There shall be a minimum of 36 drilled and tapped holes in the turntable bearing.

The diameter of the turntable bearing shall be a minimum of 42”. The turntable bearing shall be able to rotate 360 degrees in either direction on one-inch thick stainless steel ball bearings. The turntable bearing shall be bolted to the top of the mainframe assembly using a minimum of 36 Grade 8 bolts.

4.270 STABILIZERS

The stabilizer control station (main hydraulic valve body) shall be located in the compartment directly underneath the turntable next to the jump seat entrance on the left side of the vehicle. The single stabilizer control station shall control all stabilizer operations. The stabilizer control station shall accomplish two important functions: 1] allows person to stay at one centralized location 2] provides faster set up time for the vehicle.

Individual control valves shall be supplied for each mode of stabilizer operation. There shall be a plaque located next to each control valve displaying the function.

A two position manual hydraulic transfer valve (diverter valve) shall be installed adjacent to the stabilizer control station to direct hydraulic power to either the stabilizer operations or the ladder operations in order to prevent operation of both circuits at the same time.

There shall be three other controls located at the stabilizer control station:

(a) On/off switch for auxiliary hydraulic motor
(b) High speed control for hydraulic system
(c) On/off switch for electrical power to pedestal and ladder

There shall be two stabilizer jacks located in the mainframe assembly. Each stabilizer jack shall consist of a high strength steel tube attached to the stabilizer jack.

Each stabilizer jack shall be furnished with a holding valve and a manually positioned steel pin lock. The pin lock safety feature is designed to not let the stabilizer jack retract should the holding valve bleed off slowly or suddenly. Each stabilizer shall be equipped with a pressure sensor indicating when the stabilizers are in contact with the ground and have adequate pressure for safe operations. The aerial device will not be able to deploy without adequate pressure on all stabilizers.

The midship mounted stabilizer jack rams shall have a minimum bore and stroke of 5" x 21". The ground jacks, when fully extended from the right side to the left side, shall have a maximum spread of 18 feet to provide maximum safety and stability. Also, when the jacks are fully extended, each box beam shall have a minimum of 43" of overlap inside the mainframe assembly, which is extremely crucial for structural integrity, as well as maximum safety and stability. The extendable jacks shall be designed that they may be operated simultaneously on both sides of the apparatus and horizontally positioned (H type system, out and down) to accommodate obstructions such as curbs, pavement depressions, parked vehicles or any other hindrance. The box beam tubes in the top portion of the main frame assembly shall be heavy duty reinforced with welded steel solid box bands, measuring 1" x 4" for structural integrity.

There shall be two rear jacks located directly behind the rear tandem axle area, one each side of the vehicle, designed to come straight down to take the weight off the rear suspension system. This shall enable the vehicle to be set up in tight or confining spaces with cars, additional fire apparatus, or other obstructions nearby.

Any I-beam or contributing structural member, through which the jacks support the weight of the ladder or any position of the apparatus plus the live loads peculiar to fire fighting operations, shall be of ample strength to carry these loads without evidence of stress, bending, twisting or other failure(s). As mentioned before, pilot operated check valves shall be included on each jack cylinder and manual pin locks shall be provided for each main stabilizer jack, as additional safety.

There shall be two jack pads of light weight material, one mounted in each stabilizer jack compartment.

The following stability requirements shall be met by the aerial apparatus when it is in a service ready condition, but with all normally removable items such as water, hose, ground ladders, loose equipment, etc., removed. Items mounted on the aerial device by the manufacturer shall remain mounted.
The aerial device shall be capable of sustaining a static load 1-1/2 times its rated capacity in every position in which the aerial device can be placed when the vehicle is on a firm and level surface.

The aerial device shall be capable of sustaining a static load 1-1/3 times its rated capacity in every position in which the aerial device can be placed when the vehicle is on a slope of 5 degrees downward in the direction most likely to cause overturning.

The controls shall be arranged so that the operator may view the stabilizers in motion. An audible alarm of not less than 87 dba at any position the stabilizer can be placed in shall sound when a stabilizer is moving.

The stabilizers shall be deployed in not more than 90 sec. from a stored position to the operating position.

All parts of the stabilizers that protrude beyond the body of the apparatus shall be striped or painted with reflective material so as to indicate a hazard or obstruction.

Stabilizers shall be provided with one or more red warning light(s) visible on the side of the vehicle where the stabilizer is located.

4.271 PEDESTAL CONTROLS FOR LADDER OPERATION

An aerial ladder operator's position shall be provided on the apparatus so that the operator is not in contact with the ground. Sign(s) shall be placed to warn the operator(s) of electrocution hazards.

Indicating devices, suitably lighted, clearly marked, and conveniently arranged shall be visible from the operator's position to:

(a) Indicate rungs are aligned for climbing
(b) Indicate the alignment of the aerial ladder with the travel bed
(c) Indicate elevation, extension, and capacity ratings or provide an equivalent load indicating system.

There shall be three pedestal controls located on the pedestal control tower, which shall be positioned on the turntable on the left side of the vehicle when the ladder is in the nested position.

The three pedestal controls shall control the functions of hoisting and lowering, extending and retracting, and rotation of the ladder sections. A guardrail shall be provided at the turntable pedestal control station to prevent personnel from accidentally falling off the vehicle.
The turntable pedestal controls shall be of the manual override type. The control valve employed is the proportional type, which shall allow feathering characteristics during any operation.

The pedestal control station shall have removable panels for access to the hydraulic lines, valves and electrical wiring. There shall also be a hinged cover at the top of the control station for additional access.

Pedestal hydraulic control shall be equipped with an electro magnetic solenoid, which shall create a magnetic field to open, said hydraulic valves.

The lower pedestal control station shall be situated so the operator can easily observe the ladder while operating the controls.

Controls suitably lighted, clearly marked, and conveniently arranged shall be provided at the operator's position in order to:

(a) Elevate and lower the aerial device
(b) Extend and retract the aerial device
(c) Rotate the aerial device in either direction
(d) Operate intercom

The following additional items shall be mounted at the top of the turntable pedestal control station:

(a) On/off control switch for light to display control station for nighttime operation
(b) On/off control switch for ladder lights, one light mounted on each side of the ladder
(c) On/off control switch for high-speed control of the hydraulic system
(d) A dual intercommunication system with controls at both locations

Plaque displaying functions for pedestal ladder operation

4.272 INCLINOMETER

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

4.273 CENTRALIZED LOCATION OF ALL GROUND CONTROLS

All stabilizer jack controls, turntable pedestal controls and pump controls shall be located in one centralized area to:

(a) Allow close proximity to all control stations of the truck.
(b) Allow faster set up time for all operations of the truck.
4.274 SIGNS AND PLAQUES

Legible, permanent signs that provide operational directions and warning and caution shall be installed in positions readily visible to the operator(s).

Operational direction signs shall describe the function of each control and provide operating instructions.

Warning and caution signs shall indicate hazards inherent in the operation of the aerial ladder. These hazards may include but not be limited to:

(a) Electrical hazards involved where the aerial ladder does not provide protection to the personnel from contact with or near proximity to an electrically charged conductor.

(b) Electrical hazards involved where the aerial ladder does not provide protection to ground personnel who may contact the vehicle when in contact with energized electrical conductors.

(c) Hazards from stabilizer motion.

(d) Hazards that may result from failure to follow manufacturer's operating instructions.

Identification signs shall disclose the following information relative to the aerial device:

1. Make
2. Model
3. Insulated or non-insulated
4. Serial Number
5. Date of manufacture
6. Rated load capacity
7. Rated vertical height
8. Rated horizontal reach
9. Maximum hydraulic system pressure, if applicable
10. Hydraulic oil requirements, if applicable

4.275 QUALITY CONTROL

The quality control program shall include 100 percent nondestructive testing of all critical structural components of the aerial ladder. The manufacturer shall determine the types of nondestructive testing (NDT) to be conducted. The procedures used for NDT shall comply with the appropriate standards defined in 4-16.4. All NDT procedures shall be fully documented with respect to extent of examination, method of testing, and inspection techniques. An ASNT Level II NDT technician certified in the test latest methods shall
perform all testing. All NDT testing shall be done in accordance with the American Society for Nondestructive Testing SNT-TC-1A, Recommended Practice.

Certified welders under the guidelines of AWS D1.1, Structural Welding Code—Steel, and AWS D1.2, Structural Welding Code—Aluminum, shall perform Welds for all structural load-supporting elements.

4.276 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 chucksan 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 chucksan 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 5” minimum diameter and finish with a 3” diameter in the fifth section of the aerial. The base section shall completely enclose the first section of waterway, thereby protecting it from possible damage from buildings, roof cornices, etc. 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.

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

A 1.5” waterway drain valve shall be provided, and controlled from the pump operator’s panel.

4.277 POSITIONABLE WATERWAY

The waterway shall have the capability of being secured to the fourth or fifth section of the aerial by means of a lever operated positive locking device. To further enhance the safety of personnel working near the aerial, a permanent stop shall be provided at the end of the ladder, to prevent the waterway from leaving the aerial device.

A simple locking pin system shall not be acceptable. **NO EXCEPTIONS**

4.278 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.

4.279 VALVE ACTUATOR

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

4.280 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.

4.281 AERIAL SPOT LIGHTS

There shall be four (4) PAR-46, Spotlight 12 VDC, Includes Rubber Swivel Housing with Stainless Steel Bracket and Hardware individual on/off switches for the aerial tower; two spotlights shall be mounted at the tip of the ladder, one each side, and two (2) at the base section of the ladder, one each side to act as aerial tracking lights.

4.282 INTERCOM

A Fire Research two-way voice communication system shall be provided between the aerial ladder operator's position and the monitor position. The speaker/microphone at the tip shall allow for hands-free operation.

4.283 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.
4.284 ELECTRIC UP THE LADDER

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

4.285 STOKES RACK

A Junkin, Model SAF-3000WPC, plastic coated steel frame stretcher basket (stokes basket) shall be mounted on base section of boom.

4.286 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.

4.287 DELIVERY

The custom built fire apparatus shall be driven from the manufacturing facility to the community by a factory trained delivery engineer who shall thoroughly demonstrate the complete apparatus operation and maintenance to the fire department designated personnel.

4.288 WARRANTIES

The following warranties shall be supplied:

1. 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.
2. Life-time warranty on the frame.
3. Seven (7) year warranty on paint.
4. Ten (10) body structural warranty
5. Ten (10) year cab structural warranty
6. Two (2) year aerial mechanical warranty
7. Twenty (20) year aerial structural warranty
8. Manufacturers Warranties for all major components.

Detailed warranty documents shall be included for complete coverage on each of these warranties.
4.289 MANUFACTURING & LOCATIONS

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

4.290 TOOLS AND EQUIPMENT

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Item Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>SUPER VAC 1.5 HP Electric PPV VR3 (24&quot; Blade) - 20.5”D x 28.5”W x 27.75”H (15,875 C.F.M) with mounted Light Kit</td>
</tr>
<tr>
<td>1</td>
<td>RAMFAN 8” Blower/Exhauster w/Quick-Couple Canister, 25’ Anti-Static Duct</td>
</tr>
<tr>
<td>10</td>
<td>HEAVY DUTY 14’ x 18’ Vinyl Salvage Cover</td>
</tr>
<tr>
<td>4</td>
<td>HEAVY DUTY Vinyl Runner 30” x 20'</td>
</tr>
<tr>
<td>2</td>
<td>Straight 24” Scraper/Squeegee</td>
</tr>
<tr>
<td>2</td>
<td>Aluminum Scoop Shovel (27’ D-Handle)</td>
</tr>
<tr>
<td>2</td>
<td>Round Point 27” D-Handle Firefighting Shovel</td>
</tr>
<tr>
<td>1</td>
<td>Wide -Angle Binoculars 10 x 50</td>
</tr>
<tr>
<td>1</td>
<td>Transfer Safety Can 1 Gal, Single Opening</td>
</tr>
<tr>
<td>1</td>
<td>Transfer Safety Can 5 Gal, Single Opening</td>
</tr>
<tr>
<td>2</td>
<td>XX-Large Pac Mule Ladder Belt w/3” Side Rings 18” Lanyard</td>
</tr>
<tr>
<td>2</td>
<td>Large Pac Mule Ladder Belt w/3” Side Rings 18” Lanyard</td>
</tr>
<tr>
<td>2</td>
<td>Medium Pac Mule Ladder Belt w/3” Side Rings 18” Lanyard</td>
</tr>
<tr>
<td>1</td>
<td>20 lbs. ABC Extinguisher Alum. Valves</td>
</tr>
<tr>
<td>1</td>
<td>20 lbs. Carbon Dioxide Extinguishers</td>
</tr>
<tr>
<td>2</td>
<td>Water Stored Pressure Extinguisher</td>
</tr>
<tr>
<td>2</td>
<td>Water Extinguisher can harness</td>
</tr>
<tr>
<td>1</td>
<td>Exothermic Cutting Torch KIT</td>
</tr>
<tr>
<td>1</td>
<td>Exothermic Cutting Torch Cutting Rods 50/Box</td>
</tr>
<tr>
<td>2</td>
<td>6 lb. Flat Head Fire Axe 36” Fiberglass Handle</td>
</tr>
<tr>
<td>2</td>
<td>6 lb. Pick Point Fire Axe 36” Fiberglass Handle</td>
</tr>
<tr>
<td>2</td>
<td>36” Std. Claw Hooligan Entry Tool</td>
</tr>
<tr>
<td>1</td>
<td>12# Sledge Hammer</td>
</tr>
<tr>
<td>1</td>
<td>8# Sledge Hammer</td>
</tr>
<tr>
<td>2</td>
<td>52” Crow Bar</td>
</tr>
<tr>
<td>1</td>
<td>Heavy Duty Bolt Cutters 36” long</td>
</tr>
<tr>
<td>1</td>
<td>28” Cable Cutter (1 ½” Jaw Capacity)</td>
</tr>
<tr>
<td>1</td>
<td>10” Cable Cutter (7/8” Jaw Capacity)</td>
</tr>
<tr>
<td>1</td>
<td>Heavy Duty Bolt Cutters 18” long</td>
</tr>
<tr>
<td>2</td>
<td>Elevator Key Set</td>
</tr>
<tr>
<td>Quantity</td>
<td>Description</td>
</tr>
<tr>
<td>----------</td>
<td>-------------</td>
</tr>
<tr>
<td>2</td>
<td>Hydra-Ram forcible entry kit</td>
</tr>
<tr>
<td>1</td>
<td>K – Tool lock pulling kit</td>
</tr>
<tr>
<td>1</td>
<td>18” Officer’s Tool Kit</td>
</tr>
<tr>
<td>10</td>
<td>18” Collapsible Traffic cones</td>
</tr>
<tr>
<td>2</td>
<td>Flashback Five Light Baton</td>
</tr>
<tr>
<td>6</td>
<td>Public safety vest Vest meets both the ANSI-ISEA 207-2006 FR NFPA 701 and 107-2004 Class II Level II FR NFPA-701 standards</td>
</tr>
<tr>
<td>1</td>
<td>3/8” (10mm) x 300' Utility Rope</td>
</tr>
<tr>
<td>2</td>
<td>150’ Capacity Rope Bag w/Shoulder Straps</td>
</tr>
<tr>
<td>2</td>
<td>Pike Pole Hollow core- 10 feet</td>
</tr>
<tr>
<td>2</td>
<td>Pike Pole Hollow core – 8 feet</td>
</tr>
<tr>
<td>1</td>
<td>Pike Pole Hollow core – 12 feet</td>
</tr>
<tr>
<td>1</td>
<td>Pike Pole Hollow core – 6 feet</td>
</tr>
<tr>
<td>1</td>
<td>72” Roof Hook</td>
</tr>
<tr>
<td>2</td>
<td>6’ Trash Hook w/D Handle</td>
</tr>
<tr>
<td>2</td>
<td>10’ Trash Hook w/D Handle</td>
</tr>
<tr>
<td>1</td>
<td>Dry Wall Hook- 8 ft.</td>
</tr>
<tr>
<td>1</td>
<td>Dry Wall Hook- 6 ft.</td>
</tr>
<tr>
<td>1</td>
<td>8’ Fiberglass/Eckert Hook</td>
</tr>
<tr>
<td>1</td>
<td>TAC Stick</td>
</tr>
<tr>
<td>1</td>
<td>Junkin Plastic Basket Stretcher load capacity of 1200 lbs</td>
</tr>
<tr>
<td>1</td>
<td>Plastic Backboard Load capacity: 400 lbs.</td>
</tr>
<tr>
<td>1</td>
<td>OSHA compliant First Aid kit</td>
</tr>
<tr>
<td>1</td>
<td>Oxygen Case with Oxygen and supplies</td>
</tr>
<tr>
<td>1</td>
<td>Initial stock for trauma bag</td>
</tr>
<tr>
<td>1</td>
<td>8 section orange Trauma bag</td>
</tr>
<tr>
<td>1</td>
<td>Ajax Air Hammer Rescue kit</td>
</tr>
<tr>
<td>2</td>
<td>2 Toters 18-4” x 4” Cribs (Black)</td>
</tr>
<tr>
<td>4</td>
<td>Black Standard Step Chocks 25” x 5 1/2” x 11”</td>
</tr>
<tr>
<td>4</td>
<td>Black Standard Wedges 4” x 4” x 18”</td>
</tr>
<tr>
<td>4</td>
<td>Black Standard Wedges 2” x 4” x 12”</td>
</tr>
<tr>
<td>2</td>
<td>Portable Honda Generator Light, Light Watts: 500 -AC Output: 2000</td>
</tr>
<tr>
<td>6</td>
<td>Fire Vulcan® LED Vehicle Mount w/12v DC</td>
</tr>
<tr>
<td>4</td>
<td>Barricade Tape (Fire line do not cross)</td>
</tr>
<tr>
<td>1</td>
<td>Automotive Emergency Entry tool kit</td>
</tr>
<tr>
<td>2</td>
<td>Warthog Ventilation Blade</td>
</tr>
<tr>
<td>2</td>
<td>Warthog Ventilation Blade 20mm to 1” Spacer</td>
</tr>
<tr>
<td>1</td>
<td>Bracket for 20 lb Dry Chemical Extinguisher</td>
</tr>
<tr>
<td>2</td>
<td>Bracket for 2 1/2 gal. Water Extinguisher</td>
</tr>
<tr>
<td>1</td>
<td>Bracket for 20 lb CO2 Extinguishers</td>
</tr>
<tr>
<td>2</td>
<td>Air Caddy for 30 min. Low Pres. 45 or 60 min. High Pres. Cylinders</td>
</tr>
<tr>
<td>2</td>
<td>Irons Sling</td>
</tr>
<tr>
<td>1</td>
<td>M/V Fire/Rescue crash kit</td>
</tr>
<tr>
<td>Item Description</td>
<td>Quantity</td>
</tr>
<tr>
<td>---------------------------------------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>TS 700 STIHL Cutquik® Professional Cut-Off Machine</td>
<td>2</td>
</tr>
<tr>
<td>MS 460 STIHL Magnum™ Chain Saw 20” Bar</td>
<td>2</td>
</tr>
<tr>
<td>MS 460 R STIHL Magnum™ &quot;Rescue&quot; Chain Saw 20” Bar</td>
<td>2</td>
</tr>
<tr>
<td>OILOMATIC® STIHL RAPID™ Duro Rescue (RDR) Chain</td>
<td>10</td>
</tr>
<tr>
<td>OILOMATIC® STIHL RAPID™ Super Comfort (RSC) Chain</td>
<td>10</td>
</tr>
<tr>
<td>2 Gallon 2 cycle oil mix</td>
<td>24</td>
</tr>
<tr>
<td>1 Quart Bar oil</td>
<td>24</td>
</tr>
<tr>
<td>14” Masonry cut off blade</td>
<td>10</td>
</tr>
<tr>
<td>14” metal cut off blade</td>
<td>10</td>
</tr>
<tr>
<td>Ram Jammer (for extrication)</td>
<td>1</td>
</tr>
<tr>
<td>Fein Turbo I, 6 gal. Auto-Start Dust Free Wet/Dry Vac</td>
<td>2</td>
</tr>
<tr>
<td>Lincoln Lubrication GREASE GUN PISTOL 16OZ FLEX HOSE</td>
<td>2</td>
</tr>
<tr>
<td>Plews/Lubrimatic Plews/Lubrimatic 10301 Multipurpose Grease</td>
<td>3</td>
</tr>
<tr>
<td>Craftsman 32 pc. Standard and Metric 12 pt. Combination Wrench Set</td>
<td>1</td>
</tr>
<tr>
<td>Craftsman 24 Pc. Screwdriver Set</td>
<td>1</td>
</tr>
<tr>
<td>Craftsman Utility Knife</td>
<td>1</td>
</tr>
<tr>
<td>Allway 3-notch Utility Knife Blades, 50 pk.</td>
<td>1</td>
</tr>
<tr>
<td>Craftsman 1 in. x 30 ft. Steel Measuring Tape</td>
<td>1</td>
</tr>
<tr>
<td>Craftsman 4 pc. Dual Material Fold-Up Hex Key Set</td>
<td>1</td>
</tr>
<tr>
<td>Craftsman 6 pc. Pliers Set</td>
<td>1</td>
</tr>
<tr>
<td>Vise Grip 3 pc. Pliers Set</td>
<td>1</td>
</tr>
<tr>
<td>Craftsman 16 in. Pliers, Arc Joint</td>
<td>1</td>
</tr>
<tr>
<td>Trademark Heavy Duty Aviation Tin Snip</td>
<td>1</td>
</tr>
<tr>
<td>Craftsman 10/12 in. Adjustable/Tubular Frame Hacksaw</td>
<td>1</td>
</tr>
<tr>
<td>Craftsman 20 oz. Curved Hammer</td>
<td>1</td>
</tr>
<tr>
<td>Craftsman Dead Blow Hammer</td>
<td>1</td>
</tr>
<tr>
<td>Scotch Duct Tape, Multi-Use, 1 roll</td>
<td>4</td>
</tr>
<tr>
<td>Milwaukee Electric Tools Milwaukee Elec. Tool 092829 28V Cordless 4-Piece Combo Kit</td>
<td>2</td>
</tr>
<tr>
<td>Milwaukee Electric Tools Milwaukee Elec. Tool 653621 Super Sawzall</td>
<td>2</td>
</tr>
<tr>
<td>Milwaukee High Performance Bi-Metal Sawzall Blades - 6” 18tpi super sawzall b</td>
<td>1</td>
</tr>
<tr>
<td>Craftsman 16 in. Tool Bag</td>
<td>1</td>
</tr>
<tr>
<td>Igloo 5 Gallon Water Cooler</td>
<td>1</td>
</tr>
<tr>
<td>Extreme Duty Booster Cables</td>
<td>1</td>
</tr>
<tr>
<td>Legacy Flexilla The Monster 1/2 in. x 25 ft. Air Hose</td>
<td>2</td>
</tr>
<tr>
<td>Craftsman 8 pc. Quick-connect Coupler Set</td>
<td>2</td>
</tr>
<tr>
<td>Craftsman Pushlock 25 ft. Power Cord</td>
<td>2</td>
</tr>
<tr>
<td>Craftsman 94 pc. Easy-To-Read Mechanics Tool Set</td>
<td>1</td>
</tr>
<tr>
<td>Craftsman 18 in. Pipe Wrench, Steel</td>
<td>1</td>
</tr>
<tr>
<td>Craftsman 14 in. Pipe Wrench, Steel</td>
<td>1</td>
</tr>
<tr>
<td>Craftsman 24 in. Dual Fill Push Broom</td>
<td>1</td>
</tr>
</tbody>
</table>

1) JLSG, GAS SIMO PUMP LOW PRESSURE WITH HONDA 4 STROKE 5.7 HORSEPOWER
1) ML28 Defender w/PB Arms w/Streamline Couplings
1) JL500 Cutter
1) T59 RAM STREAM LINE
3) 30ft TWIN LINE HYDRAULIC HOSE ORANGE, WITH STREAMLINE CONNECTORS

Air Bags

2 KPI-17 Paratech, MaxiForce high pressure lifting bag.
2 KPI-32 Paratech MaxiForce high pressure lifting bag.
2 KPI-44 Paratech MaxiForce high pressure lifting bag.
2 KPI-74 Paratech MaxiForce high pressure lifting bag.
1) Paratech MaxiForce Master Control Package

Cribbing

1) Crib Kit w/bags- Turtle Plastics USAR Crib kit with Bags/Toters 72 pieces -
(24)4x4x18, (24) 2x4x18, (12) 4x4x20 wedges, (12) 2x4x12 wedges, (1) carry bag, (4) toters
2) SC-1 – Step Chocks Turtle Plastics.

Rescue 42

1) Rescue 42 Truck/tripod Kit.

1 ISG Infrasys Elite XR Thermal Imaging Camera
3 ISG Infrasys Elite XR EXTENDED SUPERCELL BATTERY
1 ISG Infrasys Elite XR DESKTOP CHARGER
1 ISG Infrasys Elite XR NEW FAST ATTACK PLUS TRUCK CHARGER
1 ISG Infrasys Elite XR RETRACTABLE LANYARD
2 Powerheart AED G3 Plus (CARDIAC SCIENCE)
2 IntelliSense® lithium AED battery(CARDIAC SCIENCE)

14 Hi Combat hose 1 3/4" x 50'
14 Hi Combat hose 2 1/2" x 50'
10 100' Large Diameter Hose 5” Hi Combat
1 oxy-acetylene cutting torch set

RIT bag (bottle, face piece, mask harness, bottle covers, search rope.)

1 24 - 30” handle water shut off tool slotted residential

1 Tele-Lite Adapter, Male 15A, 125V Straight Blade to Female 20A, 125V Twist Lock
4 Tele-Lite Adapter, Male 15A, 125V Straight Blade to Female 20A, 125V Twist Lock
4 Tele-Lite Adapter, Male 15A, 125V Straight Blade to Female 20A, 125V Twist Lock
4 Tele-Light Extension Cords, 10/3 SJOW, Yellow
4 Tele-Lite Sprinkler Stops
2 2 1/2 In-Line Foam Eductor
2 TFT stacked tips (1,1 1/8,1 1/4) 1 1/2 base thread
2 TFT playpipe with shut off (2 1/2 x 1 1/2)
4 TFT 1 1/2 x 1 1/2 valve with grip
4 TFT smooth bore tip 1 1/2 base
4 TFT jumbo intake relief valve
6 TFT adapter 5" storz x 4.5 hydrant
4 TFT gated wye 2 1/2 x 1 1/2
1 TFT siamese 5" storz x 2 1/2
4 TFT LDH spanner wrench set with bracket
2 TFT 2 1/2 celler nozzle
2 TFT hose roller
2 XXC- 52 Blitzfire Monitor, Storage Bracket, Max-Series Tip, 3 Stacked Tips

NOTE: MOUNTS MUST BE PROVIDED WITH ALL EQUIPMENT.

Radio Specifications

ANTENNA: PCTEL Model MAX7603, 760-870 MHz whip (available through Tessco)

MOBILE RADIO
Motorola APX 6500 ASTRO 25 Remote Mount Digital Trunked 700/800 MHz Mobile Radio

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Model Number</th>
<th>Description or Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M25URS9PW1N</td>
<td>APX6500 7/800 MHZ MID POWER MOBILE</td>
</tr>
<tr>
<td>1</td>
<td>G806</td>
<td>ADD: ASTRO DIGITAL CAI OPERATION</td>
</tr>
<tr>
<td>1</td>
<td>G51</td>
<td>ADD: SMARTZONE OPERATION</td>
</tr>
<tr>
<td>1</td>
<td>Q361</td>
<td>ADD: P25 9600 BAUD TRUNKING</td>
</tr>
<tr>
<td>1</td>
<td>G442</td>
<td>ADD: APX O5 CONTROL HEAD</td>
</tr>
<tr>
<td>1</td>
<td>G67</td>
<td>ADD: REMOTE MOUNT</td>
</tr>
<tr>
<td>1</td>
<td>G628</td>
<td>ADD: REMOTE CABLE 17’ (Length TBD by vendor)</td>
</tr>
<tr>
<td>Qty</td>
<td>Model</td>
<td>Description</td>
</tr>
<tr>
<td>-----</td>
<td>--------------</td>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td>1</td>
<td>W22</td>
<td>ADD: PALM MICROPHONE</td>
</tr>
<tr>
<td>1</td>
<td>G831</td>
<td>ADD: SPKR 13W WATER RESISTANT</td>
</tr>
<tr>
<td>1</td>
<td>G996</td>
<td>ENH: OVER THE AIR PROVISIONING</td>
</tr>
<tr>
<td>1</td>
<td>W947</td>
<td>ADD: RS232 PACKET DATA INTERFACE</td>
</tr>
<tr>
<td>1</td>
<td>GA580</td>
<td>ADD: TDMA</td>
</tr>
<tr>
<td>1</td>
<td>GA229</td>
<td>ADD: GPS ACTIVATION</td>
</tr>
<tr>
<td>1</td>
<td>G298</td>
<td>ADD: ENCRYPTION P25 &amp; MDC OTAR</td>
</tr>
<tr>
<td>1</td>
<td>G851</td>
<td>ADD: AES/DES-XL/DES-OFB ENCRYPTION</td>
</tr>
<tr>
<td>1</td>
<td>G236</td>
<td>ADD: 3 DAY DEY RETENTION APX</td>
</tr>
<tr>
<td>1</td>
<td>W81</td>
<td>ADD: KEYLOCK MOUNT APX</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PORTABLE RADIO**

<table>
<thead>
<tr>
<th>Qty</th>
<th>Model</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>H98UCF9PW6N</td>
<td>MOTOROLA APX 6000 PORTABLE MODEL 2.5 700/800MHz</td>
</tr>
<tr>
<td>4</td>
<td>Q806</td>
<td>ASTRO DIGITAL CAI OPERATION</td>
</tr>
<tr>
<td>4</td>
<td>H38</td>
<td>SMARTZONE OPERATION</td>
</tr>
<tr>
<td>4</td>
<td>Q361</td>
<td>P25 9600 BAUD RUNKING</td>
</tr>
<tr>
<td>4</td>
<td>G996</td>
<td>OTAP-PROGRAMMING OVER P25</td>
</tr>
<tr>
<td>4</td>
<td>Q947</td>
<td>RADIO PACKET DATA</td>
</tr>
<tr>
<td>12</td>
<td>QA00781</td>
<td>LITHIUM ION 4200 MAH IMPRES BATTERY</td>
</tr>
<tr>
<td>4</td>
<td>Q15</td>
<td>AES/DES, DES-XL, DES-OFB</td>
</tr>
<tr>
<td>4</td>
<td>Q498</td>
<td>ENH: MDC &amp; ASTRO P25 OTAR W/ MULTI KEY</td>
</tr>
<tr>
<td>4</td>
<td>PNNB4065A</td>
<td>IMPRES REMOTE SPEAKER MICROPHONE WITH V/JACK</td>
</tr>
<tr>
<td>4</td>
<td>NNTN7080</td>
<td>SINGLE UNIT DESKTOP CHARGER</td>
</tr>
<tr>
<td>4</td>
<td>NNTN7034</td>
<td>SPARE 4200 MAH BATTERY</td>
</tr>
<tr>
<td>4</td>
<td>QA01833</td>
<td>EXTREME ONE SIDED NOISE REDUCTION</td>
</tr>
</tbody>
</table>

**4.291 SELF CONTAINED BREATING APPARATUS (SCBA)**

There shall be six (6) SCBA units and twelve (12) SCBA Cylinders supplied with apparatus upon delivery. The SCBA shall meet the specs listed below.

a. Deltair SCBA BY AVON PROTECTION GENERAL REQUIREMENTS
The Deltair self-contained breathing apparatus (SCBA) by Avon Protection is designed for fire service use to meet the requirements outlined in NFPA and NIOSH standards.

The apparatus covered by this specification shall be of the open circuit compressed air pressure demand (positive pressure) type.

It shall be certified by the National Institute for Occupational Safety and Health (NIOSH) and the Mine Safety and Health Administration (MSHA) for use as either a 30 minute, 45 minute, or 60 minute rated duration breathing apparatus. Additionally the apparatus must be in compliance with all of the performance requirements of the National Fire Protection Association's 2013 Edition of their NFPA 1981 and 1982 standard.

It shall pass portions of MIL STD 810M.

It shall pass Intrinsic Safety testing UL913 6th edition.

The back frame shall withstand 1000lb lift capacity.

b. GENERAL COMPONENTS

The apparatus shall consist of the following major components:

Two-piece composite back frame assembly with universal cylinder band to accommodate a variety of cylinders from 2216 psi to 4500 psi; 30, 45, 60-minute duration.

A double curve facemask, available in 3 different sizes with permanent Anti-fog and hard coated visor. Facemask has inner mask that will accommodate "end of service alarm" light display, waterproof microphone for VAS communications, and a spectacle kit mounted on the nose cup. Head harness available in a Kevlar net head harness.

Integrated Air Switch™ Regulator allows you to switch from ambient air to cylinder air instantly.

Quick release waist belt and shoulder harness assembly for easy cleaning.

Enclosed "end of service alarms" (bell and in-mask HUD display).

Integrated 2nd stage regulator built into facemask along with the head-up (HUD) display which is completely submersible for easy cleaning and disinfecting.
• Fully sealed first stage pressure reducer.
• Control Console with integrated VAS speaker, PASS reset and radio communications control.
• Universal cylinder spoon accommodates all SCBA cylinders.
• Electronics package to include a Personal Alert Safety System (PASS), Control Console with integrated Voice Amplification (VAS) and radio/PASS controls and analog gauge.
• C-6 Battery Pack with quick release system.

c. **PNEUMATIC ASSEMBLY**

• The 1st stage sealed pressure reducer shall be protected inside the 2-piece back frame assembly.

• The 1st stage pressure reducer shall be connected to the cylinder valve by a 3/16” bore, covered stainless steel and fire retardant rubber wrap over P.T.F.E. high pressure hose.

• The 1st stage pressure reducer shall have a double spring and a piston that requires no adjustment.

• The 1st stage pressure reducer shall incorporate a self-seating pressure relief valve to prevent high-pressure air from entering the low-pressure side of the assembly and shall require no adjustment.

• All hoses shall attach to the 1st stage pressure reducer by means of u-clip technology with o- ring seals. High pressure and low-pressure hoses shall be of different sizes so they can only be fitted in their respective positions; all hoses shall then be retained in reducer body by a cover screwed to the reducer body.

• The 1st stage pressure reducer shall be capable of working at full input cylinder pressure of either 2216 psi or 4500 psi with no modification or adjustment.

• The 1st stage pressure reducer shall be capable of accepting breathing air from an outside source through an optional airline pigtail assembly that will be connected directly to the reducer.

• The airline pigtail shall be attached to the harness waist belt of the wearer for easy connection and disconnection.

• The pneumatic assembly shall be capable of offering an optional dual tether, buddy- breathing system that will allow 2 or more people to use the same cylinder
air in an emergency without unplugging pneumatics in an IDLH Atmosphere.

- All solid state components are waterproof and intrinsically safe.
- The Rescue Intervention Crew (RIC) fitting shall include a self-checking valve to prevent over pressurizing of a cylinder without venting air to atmosphere.
- The hand wheel connection to the cylinder valve assembly shall be of a large design so that it is easily accessible to the user using gloved or non-gloved hands.

d. **AIRSWITCH SECOND STAGE DEMAND VALVE**

- The second stage regulator shall be integrated into the facemask and will be able to be submersed in disinfectant and water without disassembly.
- The second stage regulator will incorporate a fresh air mode that allows switching from ambient air to cylinder air instantly.
- The second stage regulator will incorporate the inhalation and exhalation into one component.
- The second stage regulator shall not protrude from the facemask more than 1 ½ inches.
- The second stage regulator shall be manufactured from rugged non-metallic material that will not corrode or deteriorate from chemical attack. It must be capable of delivering peak flows in excess of 500 lpm to a minimum of 30 breaths past the sounding of the audible alarm. The demand valve shall have been tested and remained functional after being subjected to direct flame for not less than 10 seconds at a peak temperature range of 1500 - 2000 degrees Fahrenheit. The average mean of all peak temperatures shall be no higher than 1742 degrees Fahrenheit. When the flame is extinguished, no part of the assembly shall show an after-flame duration of greater than 2.2 seconds.
- The second stage regulator shall incorporate a true emergency bypass, which when manually activated will flow between 85/120 liters per minute. The bypass on/off hand wheel shall be at least 1½ " in diameter, center mounted on the second stage demand valve, and allow for activation by a gloved hand. It shall take no more than a half turn of the bypass on/off and wheel to activate the bypass fully.
- The second stage demand valve shall incorporate a secondary sintered filter.

e. **FACEMASK**
- The facemask shall be a full facemask type that covers the wearer's nose, mouth and eyes.
- The facemask mask shall have a single intensifier edge seal.
- The facemask visor shall be one piece and constructed of an impact resistant polycarbonate material in a double curve design; it shall be optically correct and have permanent anti-fog and hard coating on the visor. The visor shall be tested to and pass the NFPA Radiant Heat Test.
- The facemask shall have a removable inner mask constructed of the same material as the outer shell of the mask and the inner mask shall be fitted with inlet valves and allow for a nose cup mounted spectacle kit.
- The facemask shall be available in 3 sizes.
- The facemask shall contain a speech diaphragm and shall be mounted directly in line with the wearer's mouth.
- The facemask will have a 2–point "Pull Forward" Kevlar net head harness.
- The facemask shall be made of a butyl blend.
- The inner nose cup shall accommodate the “end of service alarm” light display that shows cylinder pressure in quarter increments, until it reaches 33% of full, by displaying LED lights.
- VAS and radio interface system shall have an internal waterproof microphone inside the inner nose cup to provide clear communications.
- The in-mask display shall have 7 LED lights. Four lights indicate quarter rating of cylinder pressure, until the 33% of full level. The fifth light indicates low battery status. PASS pre-alarm is indicated by alternately flashing red and green LED light. A 6th light indicates radio transmission (green when on and red when transmitting) and blinks green when in VOX mode and not transmitting. The 7th light shall blink green indicating in range for the telemetry option. It shall blink red for low battery and blink a rapid red for evacuate (along with the audible alarm. Constant red indicates "out of range".
- The facemask shall have no loss of operational function after being subjected to direct flame for not less than 10 seconds at a peak temperature range of 1500 - 2000 degrees Fahrenheit. The average mean of all peak temperatures shall be no higher than 1742 degrees Fahrenheit. When the flame is extinguished, no part of the assembly shall show an after-flame duration of greater than 2.2 seconds.
- The facemask shall include a robust hanger for hanging the mask when not in use.
f. BACKFRAME AND HARNESS

- The back frame shall be made of fire retardant Thermoset Composite, 2-piece construction to protect the pneumatic system.

- The back frame cover will be made of a stamped aircraft aluminum material, and the harness assembly and side arms will be attached to the cover.

- The back frame shall have swinging sidearm to distribute weight for wearer comfort.

- The right and left shoulder straps shall be constructed of 2 inch woven Kevlar and be padded in areas of contact with PBI/Kevlar. They will be contoured to the user's body.

- Shoulder strap adjustable slides shall be constructed of stainless steel. Two-inch pull straps shall be fitted to harness to allow easy adjustment even with gloved hands.

- The harness shall have sleeves with reflective graphics for the routing of the pneumatic hoses and electronic cables.

- The harness waist belt shall be of 2" woven Kevlar and be fitted with a "Double Pull Forward" design and incorporate a buckle latch.

- The harness assembly shall experience no loss of operational function after being subjected to direct flame for not less than 10 seconds at a peak temperature range of 1500 - 2000 degrees Fahrenheit. The average mean of all peak temperatures shall be no higher than 1742 degrees Fahrenheit. When the flame is extinguished, no part of the assembly shall show an after-flame duration of greater than 2.2 seconds.

- The universal cylinder band assembly shall be adjustable in the field to accommodate all sizes of cylinders without the use of tools.

- A universal cylinder band shall be designed so that during cylinder change it can remain in either the closed loop or fully open positions.

- Cylinder changes shall be made without removing cylinder band.

- All SCBA manufacturers’ cylinders shall mount easily onto the back frame.

- A standard lumbar support shall be made of PBI/KEVLAR

- Flashing locator lights to aid in rescue shall be emitting from the back frame and flash rapidly when the PASS is in full alarm.
• Shoulder harnesses shall include large loop style buckles for use with gloved or non-gloved hands.

g. ALARM AND PRESSURE INDICATOR ASSEMBLY

• The primary "end-of-service" alarm shall be an independent bell. The secondary “end-of-service” alarm shall be a heads-up display with a flashing red light for low air alert.

• The bell alarm shall be located at the top of the back frame, close to the user’s ear. The bell shall alarm at 33% of the remaining cylinder life.

• The in-mask display shall have four lights that indicate cylinder pressure, two green, one yellow and one red light. When the cylinder is full, all four lights will be on. An additional yellow fifth light is off-set from the display indicate a low battery.

• In-mask pressure display will display one light per quarter increments of cylinder pressure until it reaches the 33% level. As the pressure decreases, the display lights will go out until the red light is “on” and flashing rapidly as the 33% of full indication.

• One battery source that powers the HUD, PASS, Control Console, VAS and Radio Interface option. They shall be communicating via a wired network.

• A low battery indicator shall illuminate when battery has at least a minimum of three hours remaining.

• A redundant analog gauge shall be incorporated into the console assembly as a backup air pressure indicator.

h. CONTROL CONSOLE

• PASS operation shall be displayed within the control console. Light shall change from white to a red LED light when PASS is in alarm.

• All communications shall be within the control console and can be operated hands free. This includes VAS and Radio Interface.

• The VAS threshold settings shall have multiple settings and house the information in the HUD.

• The solid state components can be switched between 2216 and 4500 without any component changes.

• The Control Console shall have a sensor to identify motion.
• The PASS alarm shall be a wired system from the control console.

   i. **PASS**

   • The PASS shall activate after 30 seconds of no motion.

   • The PASS shall have motion sensors to detect motion.

   • The PASS shall be enclosed inside the two-piece back frame.

   • The PASS shall only use one piezo alarm to meet the new NFPA standard, reducing battery consumption.

   • The PASS shall have Data Logging capability to log 2000 events.

   j. **BATTERY**

   • The SCBA shall only have one battery source to power all standard electronic features to include HUD, PASS, Console radio functions, and VAS.

   • The SCBA shall be powered by only 6 “C” cell batteries.

   k. **RIC UNIVERSAL FITTING**

   • The RIC shall have a check valve that stops airflow when the cylinder is full.

   • The RIC shall not vent air to atmosphere.

   • The RIC connections shall allow a 2216 or 4500 psi cylinder to be used to transfer cylinder air.

   l. **CYLINDER A CYLINDER VALVE**

   • All cylinders supplied with the Deltair are to be approved by the United States Department of Transportation (DOT).

   • Cylinder valve assemblies shall contain a safety relief device. The cylinder valve shall contain a protected gauge visible from both sides. Cylinder valve hand wheel shall be of the non-ratchet or locking type.

   • All high-pressure cylinder valve hand wheels will be red to identify a high pressure cylinder.

   • Low pressure cylinder valve hand wheels will be black.
• Cylinders are available in 2215 psi 30 minute carbon and 4500 psi 30, 45 and 60 minute carbon designs.

m. OPTIONS

• Duo Tether Buddy Breather (Internal) will provide a two-foot tether from each SCBA when plugged into another Deltair SCBA and stowed inside the back frame. A second Duo Tether Buddy Breather version (External) is an externally stored Kevlar pouch design mounted on the left side of the waist belt with a three foot tether from each SCBA.

• Optional Echo Tracer Ultrasonic Tracking System module shall, when ordered, easily mount on the back frame housing around the cylinder spoon with no required tools. The back frame beacon shall begin transmission when the PASS is in full alarm and cease transmission when PASS is reset.

• Optional Airline attachment shall connect to the 1st stage reducer using u-clip technology.

• Available airline fittings shall be Hansen HK and Rectus. NIOSH 42 CFR only approval for airline hose sections in 6, 25, 50, 100 and 300 foot sections.

• Optional rescue belt shall replace existing waist belt assembly when attached to the Deltair SCBA and be detachable with no tool to be used as a stand-alone rescue belt. The SCBA shall be able to detach from the rescue belt quickly without removing the rescue belt with the use of two side mounted release straps.

• Radio interface shall be integrated into the Deltair SCBA. An additional radio interface cable is required to connect to user's radio. All radio operations are Control Console operated and can be put into voice activated or push-to-talk modes.

6.0 General Specifications

6.1 The bid response must include the following documents in this order

• Supplier Information Form
• Non-Discrimination Statement
• Proposed Schedule of MWBE Participation
• Bid, Performance, & Payment Bonds
• Other requested submittals as stated

All referenced documents must be completed and returned in their entirety to constitute a complete bid.
6.2 Bids may be submitted manually to the address listed in the bid documents or electronically via the supplier portal in sufficient time to ensure receipt by the Purchasing Department on or before 1:30 P.M. on the date specified in the web page listing for this event. Requested documentation may be attached to the bidder’s response. A supplier guide for assistance in submitting responses can be found by clicking on the Important Documents tab of the Purchasing SavEPro webpage at: http://www.savannahga.gov/cityweb/purchasingweb.nsf

6.3 Original invoices should be sent to:

City of Savannah
P.O. Box 1027
Savannah, GA 31402

6.4 Vendor is responsible for determining and acknowledging any amendments issued in connection with this bid solicitation.

6.5 To submit and be awarded a bid, bidders must be registered as a bidder on the City of Savannah’s website at www.savannahga.gov.

6.6 Bonding:

(Check where applicable)

[X] (A) Each bidder shall post a bid bond, certified check or money order made payable to the City in the amount of 5% of the bid price. A company check is not acceptable. No bids shall be read or considered without a proper form of security.

[ ] (B) No bond, certified check, or U.S. Money Order is required.

[X] © Bidder shall post a payment / performance bond, certified check or money order payable to the City in the amount of 100% of the bid price if awarded the purchase. Such bond(s) are due prior to contract execution as a guarantee that goods meet requirements of the contract including timely delivery, performance specifications and warranty requirements. Such bonds will also guarantee quality performance of services and timely payment of invoices to any subcontractors.

[ ] (D) Bidder shall post a performance bond, certified check or money order in the amount of % of the bid price if awarded the purchase. Such bond(s) are due prior to contract execution as a guarantee of timely delivery and that equipment, materials and /or goods are delivered according to specifications.

Whenever a bond is provided, it shall be executed by a surety authorized to do business in the State of Georgia, approved by the City, and must be executed on the attached forms. At the discretion of the City, other forms of security may be considered in lieu of a performance bond.
EXCEPTION SHEET

Event# 1955

If the commodity(is) and/or services proposed in the response to this bid is in anyway different from that contained in this proposal or bid, the bidder is responsible to clearly identify by specification section number, all such differences in the space provided below. Otherwise, it will be assumed that bidder’s offer is in total compliance with all aspects of the proposal or bid.

Below are the exceptions to the stated specifications:

Date ________________   Signature______________________________

Company______________________________

Title_______________________________
BID PROPOSAL FORM

(SUBMIT AS THE COVER SHEET)

City of Savannah Purchasing Department
3rd Floor, City Hall
P. O. Box 1027
Savannah, Georgia 31402

EVENT NUMBER: 1955
Business Location: (Check One)
Chatham County
City of Savannah
Other

ATTN: Purchasing Director

ALL BIDDERS MUST BE REGISTERED VENDORS ON THE CITY’S WEBSITE. PLEASE REGISTER AT WWW.SAVANNAHGA.GOV.

Name of Bidder:______________________________________________________

Street Address: ________________

City, State, Zip Code:__________________________________________________

Phone: ___________________            Fax: ________________________________

Email: _______________________________

DO YOU HAVE A BUSINESS TAX CERTIFICATE ISSUED IN THE STATE OF GEORGIA? (CHECK ONE)
YES: _______            NO: _______

FROM WHAT CITY/COUNTY __________________
TAX CERTIFICATE #:____________________ FED TAX ID #:____________________

INDICATE LEGAL FORM OF OWNERSHIP OF BIDDER (STATISTICAL PURPOSES ONLY): CHECK ONE: ______CORPORATION ______PARTNERSHIP ______INDIVIDUAL ______OTHER
(SPECIFY: ____________)

INDICATE OWNERSHIP STATUS OF BIDDER (CHECK ONE):
_____ NON-MINORITY OWNED            _____ ASIAN AMERICAN
_____ AFRICAN AMERICAN            _____ AMERICAN INDIAN
_____ HISPANIC            _____ OTHER MINORITY
(describe) ___________

_____ WOMAN (non-minority)

Do you plan to subcontract any portion of this project? Yes______  No _____
If yes, please complete the attached schedule of M/WBE participation. Also complete the schedule if you will be using any M/WBE suppliers.

THE UNDERSIGNED PROPOSES TO FURNISH THE FOLLOWING ITEMS IN STRICT CONFORMANCE TO THE BID SPECIFICATIONS AND BID INVITATION ISSUED BY THE CITY OF SAVANNAH FOR THIS BID. ANY EXCEPTIONS ARE CLEARLY MARKED IN THE ATTACHED COPY OF BID SPECIFICATIONS.
<table>
<thead>
<tr>
<th>ITEM NO</th>
<th>DESCRIPTION</th>
<th>EST. QTY</th>
<th>UNIT PRICE</th>
<th>TOTAL PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>AERIAL APPARATUS (MEETING SPECS &amp; INCLUDING DELIVERY)</td>
<td>1EA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TOTAL BID $_____________________

PAYMENT TERMS: PLEASE CHECK ONE AND FILL IN BLANKS
(Minimum of 10 working days must be allowed
for discount to be considered in bid award)

___ Less ___% ___Days Prompt Payment Discount (if offered) (____________)  
___ Net - 30 Days (no discount offered) - 0 -  
TOTAL NET BID $ = = = = = = = = =

TIME REQUIRED FOR DELIVERY AFTER RECEIPT OF ORDER: _______DAYS

CONFIRM RECEIPT OF ANY ADDENDA ISSUED FOR THIS BID:
ADDENDUM __________ #
DATE _______________

I certify this bid complies with the General and Specific Specifications and Conditions issued by the City except as clearly marked in the attached copy.

____________________________________  ___________________________  
Please Print Name  Authorization Signature  
Date
NON-DISCRIMINATION STATEMENT

The bidder certifies that:

(1) No person shall be excluded from participation in, denied the benefit of, or otherwise discriminated against on the basis of race, color, national origin, or gender in connection with any bid submitted to the City of Savannah or the performance of any contract resulting therefrom;

(2) That it is and shall be the policy of this Company to provide equal opportunity to all business persons seeking to contract or otherwise interested in contracting with this Company, including those companies owned and controlled by racial minorities, cultural minorities, and women;

(3) In connection herewith, We acknowledge and warrant that this Company has been made aware of, understands and agrees to take affirmative action to provide such companies with the maximum practicable opportunities to do business with this Company;

(4) That this promise of non-discrimination as made and set forth herein shall be continuing in nature and shall remain in full force and effect without interruption;

(5) That the promises of non-discrimination as made and set forth herein shall be and are hereby deemed to be made as part of and incorporated by reference into any contract or portion thereof which this Company may hereafter obtain and;

(6) That the failure of this Company to satisfactorily discharge any of the promises of non-discrimination as made and set forth herein shall constitute a material breach of contract entitling the City of Savannah to declare the contract in default and to exercise any and all applicable rights and remedies including but not limited to cancellation of the contract, termination of the contract, suspension and debarment from future contracting opportunities, and withholding and or forfeiture of compensation due and owing on a contract.

__________________________________  _________________________
Signature                          Title
PROPOSED SCHEDULE OF M/WBE PARTICIPATION

Any M/WBE listed in this completed form must be certified by the City of Savannah and/or other certifying agency such as USDOT, GDOT, SBA 8(a) or GMSDC prior to the due date of this bid. Proof of M/WBE certification such as a certificate or letter from the certifying agency is required to accompany the bid. A firm that has submitted an application for M/WBE certification or an application for M/WBE certification under review but has not been certified is not qualified as a certified M/WBE and will not be recognized as such during the City’s evaluation process.

Name of Proposer: ____________________________   Event No. 1955

Project Title: ________________________________

NOTE: Unless certified through the City of Savannah’s MWBE Program, proof of MWBE certification must be attached to this completed form for all firms listed in the table below.

<table>
<thead>
<tr>
<th>Name of M/WBE Participant</th>
<th>Name of Majority Owner</th>
<th>Telephone</th>
<th>Address (City, State)</th>
<th>Type of Work Sub-Contracted</th>
<th>Estimated Sub-contract Value</th>
<th>MBE or WBE</th>
<th>City Certified Y or N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

MBE Participation Value: ______ %  
Women Participation Value: ______ %

The undersigned will enter into a formal agreement with the M/WBE Subcontractors/Proposers identified herein for work listed in this schedule conditioned upon executing of a contract with the Mayor and Aldermen of the City of Savannah. The Prime’s subcontractors’ subcontractors must enter into a formal agreement with the tier subcontractor identified herein for work listed in this schedule. It is the responsibility of the Prime contractor to ensure compliance by all subcontractors.

Joint Venture Disclosure
If the prime bidder is a joint venture, please describe below the nature of the joint venture and level of work and financial participation to be provided by the Minority/Female joint venture firm.
Joint Venture Firms | Level of Work | Financial Participation
--- | --- | ---

Printed name (company officer or representative): ________________________________
Signature: ________________________________
Title: ________________________________ Email: ________________________________
Telephone: ________________________________ Fax: ________________________________

NOTE: The Minority/Women Owned Business Office is available to assist with identifying certified M/WBEs. Please contact the M/WBE Office at (912) 652-3582. The City of Savannah’s certified M/WBE registry is posted on its website @ www.savannahga.gov.