Fire Apparatus and Custom Fabricators

SPECIFICATIONS

FOR A

SCBA REFILL AIR & LIGHT VEHICLE

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EXHAUST SYSTEM

The existing vertical chassis exhaust shall remain as equipped from chassis manufacturer

REAR MUD FLAPS

There shall be a set of rear anti-spray black mud flaps shall be installed in the rear wheel well.

CHASSIS STEPS

The original steps into the truck shall be removed; new continuous running aluminum tread brite steps shall be installed on both sides.

The fuel tank shall be enclosed with aluminum tread brite. The enclosure shall incorporate the OEM tank step recess and fuel filler. All seams shall be continuously welded.

The step shall be so arranged that a fireperson wearing heavy boots and turnout gear can easily gain access to all cab doors.

The steps shall provide anti-slip protection and shall be constructed of a raised punch aluminum diamond tread plate to facilitate draining of accidentally spilled fuel.

The truck batteries are to be located behind the steps on the left side, easily removable for servicing.

REAR TOW EYES

Under the rear tail board there shall be structural steel reinforcement attached to frame rails of chassis to support tow eye assemblies. Mounted at rear center of apparatus it must be capable to with stand the requirements of towing (not lifting) the apparatus without damage.

FLUID IDENTIFICATION PLATE

A permanently engraved plate shall be installed in the cab specifying the quantity and type of fluids used in the apparatus.

FUEL TYPE PLATE

A permanently engraved plate shall be installed on or near the fuel fill to designate the chassis fuel type.

SEATING LABEL

There shall be a label located in the cab or in view of the driver, stating maximum seating capacity.

VEHICLE HEIGHT LABEL

There shall be a label located in the cab or in view of the driver, stating the overall height of the vehicle.

SEAT BELT WARNING LABEL

There shall be a label located at all seating areas, warning personnel that death or serious injury could result from not wearing seat belts while the vehicle is in motion.

RIDING ON STEP WARNING LABEL

There shall be a label located at all exterior stepping surfaces, stating "Warning: Death or serious injury may result from riding on any stepping surface when the vehicle is in motion.

AUTOMATIC TIRE CHAINS

Rudd Brand 18 strand automatic tire chains shall be installed on the rear drive wheels.

JUMPER STUDS

A pair, one (1) positive, one (1) negative, jumper studs shall be installed near the battery box, protected but within easy access.

BODY CONSTRUCTION

Construction material of the body shall be aluminum, fully welded, with no rivets.
The use of rivets, bolted panels, or adhesive as a structural fastening system is not acceptable.

All aluminum body parts are to be welded for unitized construction to give maximum strength throughout the body.

All welds whether seen or not, shall be of good craftsmanship, and pleasing appearance. Welds, which are visible, shall be either ground smooth, cleaned or power wire brushed. We are stating that we want Fire Truck quality workmanship not standard delivery practice.

The entire body is to be modular in design, and shall be fully capable of being removed and remounted on another chassis. The body shall be engineered to provide maximum storage, while maintaining maximum structural rigidity, and long term integrity. The apparatus body structure shall be warranted for twenty (20) years.

The body under-structure shall consist of heavy duty 6" x 3.25" 6063-T6 aluminum channel extrusion lower outer rails, and 3" x .170" x 2.33, 6061-T6 alloy I beam cross members.

All floors shall be .125” aluminum sheet with 3" x .170" channel extrusion reinforcements; 6061-T6 alloy, capable of supporting a five hundred (500) pound load.

The body corner and intermediate Mid-post compartment divider extrusions shall be heavy-duty 6063-T6 alloy, custom extruded aluminum welded as an integral part of the body. Each extrusion shall be "multi-disciplined". Serving as a structural load-bearing member, slotted to provide an internal seat from which header and compartment partitions can be secured, while also serving as a roll up door track. The extrusions shall have an integrated door track channel eliminating the use of bolt on door tracks and providing larger door openings and cleaner installations. The Corner posts shall be heavy duty 4 x 3 5/8 6063-T6 alloy, with .375 wall

thickness. Each Mid-post shall be heavy duty 2 5/8 x 3 1/2 6063-T6 alloy with .375 wall thickness.

All exterior panels shall be 5052-H32/H34 corrosion resistant aluminum. The roof and wall beams shall be MIG welded to body exterior panels.

Roof and side-wall panels shall be one piece. The roof rails shall be of .1875" aluminum of 5052-H32/H34 alloy and shall be a continuous formed sheet to "square up" the top of the body to enhance looks and provide a flat mounting surface for lights. The roof rails shall extend up from the integral drip channel approximately 32" at the front, and sides. Rails shall be formed over to create a flange around the top to give rigidity to the sidewalls.

The roof sheet shall be of .125" aluminum tread brite welded around perimeter; 3004-H14 alloy. The roof shall support a two hundred fifty (250) pound person at any location without damage to the roof.

The bulkheads shall be of .125" aluminum tread-brite, MIG welded to the corner post and header; 3004-H14 alloy. Partitions shall be .125" aluminum sheet, welded to inner framing of Corner Posts and Mid-posts; 3004-H38 alloy.

All header walls and partitions dividing the compartment shall be of a double wall construction. This method will not only provide extra body strength, it serves several other unique functions. The partition walls like the extrusions are "multi-disciplined". They provide structural integrity that single wall construction cannot, plus provide a raceway for all wires required for door switches and compartment lighting, while also providing refuge for compartment lighting. Drawings shall be supplied upon request, to show details of wall construction.

All compartments shall be of sweep-out type with no lip at bottom edge. The compartment floors shall be raised 1" above the lower sill to prevent water from entering the bottom of the opening. Each compartment shall be fitted with a drain and located in such a manner as to minimize or eliminate water from entering.

All compartment sills shall be over laid with fire industry grade tread plate aluminum to protect body finish from damage or scratches when accessing the compartments.

The outer lower channels shall be clad with .125" aluminum tread plate. The tread plate shall be installed with a special fastening system. There shall be no welding of this plate.

Both the front and rear exterior walls of the body shall be constructed from .125" aluminum tread brite to provide a pleasing and maintenance free appearance.

The rear tailboard shall be constructed from structural aluminum, trimmed out in aluminum treadbrite and securely mounted to the unit’s super structure. It shall be a minimum of 9 deep and approximately 20 from ground to the tailboard. As specified in NFPA 1901-2003 edition sections 15.7.-15.8 the tailboard shall be designed to sustain a minimum static load of 500lbs with out deformation and shall be punch raised to provide skid resistance when stepping. It shall adequately support the stepping and standing of a fire person in full turn out gear but not be used to transport firefighters.

The body mounting system shall feature cross members at the front panel and at each end of the wheel box for bolting directly to the steel frame, which straddles the frame rails. Mounting should be isolated from the steel frame by other synthetic material.

There shall be minimal clearance between cab body and box. Consideration shall be given for the presence of pushup floodlights and any other equipment placed between the cab and body.

This body channel support shall be isolated with a .125" UHMW polyethylene type 819. The isolator shall lay the full length of both sides of frame rails.

All dissimilar metals shall have a barrier material between them to prevent electrolysis.

On all items that are bolted or fastened onto a painted surface there will be isolation strips installed between mating surfaces. This is to prevent problems associated with dissimilar metals and cutting the painted surface by sharp edge of installed items

The overall body width shall be 96" and overall body-only height of 90".

The entire body is to be modular in design, it shall be fully capable of being removed and remounted on another chassis.

The entire module will be undercoated.

BODY MOUNTING SYSTEM

The body mounting system shall feature cross members at the front panel and at each end of the wheel box for bolting directly to the steel frame, which straddles the frame rails. Mounting should be isolated from the steel frame by other synthetic material.

DIMENSIONS

Body Length: 202"

Body Height: 96"

Body Width: 96"

Cab to Axle: 120"

Compartment dimensions of this rescue vehicle are as follows:

Driver Side #1: **60" wide x 78" high x 27" deep**

Driver Side #2: **68" wide x 49" high x Transverse**

Driver Side #3: **60" wide x 78" high x Transverse**

Passenger Side #1: **60" wide x 78" high x 27" deep**

Passenger Side #2: **68" wide x 49" high x Transverse**

Passenger Side #3: **60" wide x 78" high x Transverse**

Rear Compartment: **36” wide x 78” high x 60” deep**

ROLL UP DOORS

The compartment doors shall be of the type that roll up on themselves. The door shall have an adjustable tubular type counter balance.

All door tracks shall have track, post, and track protector extruded in an integral heavy-duty section for added strength 6061-T6 alloy. The door track shall be an integral part of the body framework. The door shall be sealed on all sides with black weather stripping. Doors shall be capable of being removed for servicing.

All doors shall be of heavy duty extruded aluminum sectionals; 6063-T6 alloy for finishing purposes.

The door slide system shall consist of a nylon slide with end shoes. They shall slide inside of the aluminum door track.

There shall be no door track liners installed; this will prevent any moisture build up or electrolysis from dissimilar metal contact.

The doors shall have lift bar latches. All doors shall be equipped with indicator switches to alert the driver that one or more doors are not fully closed. These switches may all be connected to a single flashing warning light on the dash of the cab.

Door Style: Robinson (ROM) Rollup doors

REAR ACCESS DOOR

The rear entrance door shall be a double door type; they shall be approximately 17" wide x 72" tall. They shall be a formed aluminum sheet construction. Approximately 2" thick.

The outer doorplate shall be constructed from .160" 5052 aluminum sheet and the inner pan shall be constructed from .125" 3003-H14 aluminum sheet.

There shall be a .250" hole installed in the lower corners of the inside door pans for drainage. The doors shall be completely weather-stripped. Sealing of door opening against entrance of water to be of neoprene rubber, self-adhesive design gasket.

A window located in the middle of each door shall be as large as possible and shall be fixed.

Polished stainless steel bent door latches shall be installed on the inner door pan. The latch shall allow easy opening of the compartment door, even with gloves on.

The doors shall be securely attached to the apparatus body with full-length stainless steel piano type hinges. The door shall be mounted to the body using stainless steel nuts and bolts. Absolutely no self-tapping screws or pop rivets shall be acceptable on the doors, hinges or slam latch assemblies. NO EXCEPTIONS

Gas shock door retainers shall be installed on all vertically and horizontally hinged doors.

Grab handles shall be located along each side the door opening on a slant to aid in ascending and descending from apparatus.

FILL AND OPERATIONS COMPARTMENT

The rear L3 and R3 compartments (After rear wheel compartments) areas shall be designed to be transverse across and used specifically for walk in fill operations. The compartment shall be equipped with roll up doors on both sides and one rear access door.

Compartment walls shall be constructed from smooth aluminum sheet with a DA finished surface. The compartment floor shall be covered with NFPA compliant tread plate aluminum for durability and safety.

The provided roll up doors on the L3 and R3 compartments shall be used as module access doors. The L3 or roadside roll up door shall be provided as fill station access door while the R3 compartment will be for quick access to the cylinder rack.

Located inside the module on the curbside (with access from the R3 compartment door) shall be the 24-bottle SCBA cylinder rack as described in the body of this specification. The rack shall be installed against the R3 door so when the door is opened, the rack can be accessed from the outside.

The front of wall of this compartment shall house the operations panel, which will contain all necessary controls and instruments for the compressor and fill station operation. All controls and instruments shall be mounted with maximum consideration given to lay out and ease of operation. Panel shall be centered in the front wall.

Located on the roadside (L3) to the left of the operations panel shall be the fill station itself. It shall be mounted to the floor along facing inside. Provisions shall be provided in the floor to direct air safely under the truck in the event of a cylinder failure.

Atop of the fill station shall be a shelf from smooth 1/8” aluminum. The shelf shall be for the examination of cylinders and shall be designed to prevent cylinders from rolling off when unattended. Built into the shelf shall be two pockets for holding cylinder inspection cards and plastic ty-wraps.

LIGHTING

Located on the ceiling shall be a combination of lights to illuminate the operations compartment. Four 12 volt operated Weldon 1010 dome lights shall be installed along the ceiling. A 110-volt, two bulb 48" shielded fluorescent light shall be installed in on the ceiling to provide light when generator is in operation. The fluorescent light shall be wired to the breaker box on its own circuit. All lights shall operate of switches located in the wall inside by the rear entrance door.

AIR CONDITIONING

A single roof mounted Duo Therm or equivalent low profile RV style roof mounted air conditioning / heater unit shall be mounted on the roof. It shall protrude through the roof with

controls located on the unit. Energy efficient quiet compressor, and three speed blower operates via manual electronic switches located on control panel, which protrude through the roof of the unit. It shall have the cooling capacity of a minimum of 13,000 BTU cooling capacity, and 5,600 BTU heating capacity.

AUXILIARY HEATER

In addition to the cooling climate system, the body interior shall be equipped with a 30,000 BTU hot water heater connected to the truck cooling system. The heater shall be located in the front of the compartment. The heater shall forced air type with at least a two speed control. It shall have an aluminum tread plate cover with ventilation outlets to distribute the heated air. The controls shall be located along with the light switches.

A manual bypass valve shall be installed inline in a mutually agreed upon location to allow personnel the ability to shut down the heater during warmer months.

ADJUSTABLE SHELF

The heights of all shelves shall be easily adjustable by using P-1000 aluminum unistrut, welded permanently to the side bay walls, along with appropriate fasteners. The unistrut is to be continuous from the top to the bottom portion of the compartment.

Each shelf shall be capable of supporting a minimum weight of three hundred fifty (350) pounds.

All shelves are to be of 3/16" smooth aluminum with press formed flanges of 2" on all four sides and have D.A. sanded finish.

Shelf dimensions shall vary to accommodate the specified compartment for which it is to be mounted.

SCBA BOTTLE STORAGE RACK

The SCBA storage unit shall be constructed of all aluminum, and mounted in a specified compartment. The unit shall be capable of storing up to a specified amount of SCBA bottles securely during transport. The storage unit shall have an external rubberized finish as well as each storage space shall be coated entirely with a rubber enhanced liner. The liner will protect bottles from superficial injury and minimize any rattling during transport. The use of neoprene liners adhered to the storage unit will not be accepted.

The rack shall be provided with a closure system that safely secures the bottles in the rack while vehicle is in motion. The system shall feature an outer drop down guard that slides in formed channels in the rack. The guard shall be easily attached and can be locked in a "secure" or "unsecure" position without the aid of hand tools. The guard shall be split into two sections denoting either full or empty cylinders. Each section shall be color coded and labeled appropriately to aid in the identification of cylinders.

COMPARTMENTATION

L1 COMPARTMENT (FIRST ROADSIDE COMPARTMENT BEHIND CAB)

This compartment shall contain the following:
Four (4) extruded aluminum tracks mounted for adjustable shelving.
Two (2) adjustable shelves furnished and installed.
Two (2) 120-volt electric cord reels with 300 feet of black 10/3 cable shall be furnished and installed.
Two (2) fairleads shall be located with the cord reel location.
The cord reel shall be provided with a Circle "D" electrical outlet junction box with 15 amp receptacles.
Four (4) DOT 6,000 PSI cascade cylinders located 2x2 towards the front or rear of the compartment.
One (1) SCBA pull out board for storage of user supplied air packs.

L2 COMPARTMENT (ROADSIDE OVER WHEEL WELL COMPARTMENT)

This compartment shall contain the following:
The Mako air compressor
Eight (8) GFE tri-pod lights w/650-watt lamp heads.
It shall also contain a ceiling mounted electric rewind high pressure Hannay Reel with 200 feet ¼ 6,000 PSI hose w/CGA fittings, valve and gauge.

L3 COMPARTMENT (ROADSIDE COMPARTMENT BEHIND REAR WHEELS)

This compartment shall be the compressor air control room.

R1 COMPARTMENT (FIRST COMPARTMENT BEHIND CAB, CURBSIDE)

This compartment shall contain the following:
Four (4) extruded aluminum tracks mounted for adjustable shelving.
Two (2) 120-volt electric cord reels with 300 feet of black 10/3 cable shall be furnished and installed.
Two (2) fairleads shall be located with the cord reel location.
The cord reel shall be provided with a Circle "D" electrical outlet junction box with 15 amp receptacles.
Four (4) DOT 6,000 PSI cascade cylinders located 2x2 towards the front or rear of the compartment.
Three (3) pullout drawers for carrying related supplies. Drawers to be 6" in depth.
One (1) slide tray as deep as the compartment and with a capacity of 250 to 300 #s.

R2 COMPARTMENT (CURBSIDE COMPARTMENT OVER REAR WHEELS)

This compartment shall contain the Mako air compressor and eight (8) GFE tri-pod lights w/650 watt lamp heads. It shall also contain a ceiling mounted electric rewind high pressure Hannay Reel with 200 feet ¼ 6,000 PSI hose w/CGA fittings, valve and gauge.

R3 COMPARTMENT (CURBSIDE COMPARTMENT BEHIND REAR WHEELS)

This compartment shall contain the following:
There shall be a thirty (30) SCBA bottle storage rack constructed of smooth aluminum located inside of compartment door #R-3.

The rack shall be six (6) bottles wide by five (5) bottles high.

The storage rack will be coated with rubberized material to prevent marring of the bottles.

The rack shall be open at the front and rear so that air bottles can be inserted or removed from exterior or interior of the body.

The storage rack shall be provided with an enclosure system that safely secures the bottles in the rack while the vehicle is in motion.

The enclosure system must consist of a single inner and outer panel with holes that match the storage rack holes, the enclosure panel will be capable of sliding up and down through the use of tracking locate at front and rear of the rack system.

The enclosure panels shall be capable of being locked into both the up and down position with quick release latches.

When both panels are in the up position the air bottles can be inserted or removed from the front or rear of the rack.

The enclosure panels must be painted “Green/Yellow” with the paint color split down the middle of the panels for identification of the air bottles that will be stored in the rack.

WHEEL STEPS

There shall be two (2) stainless steel wheel steps. They shall be removable, spring steel bar steps capable of supporting a minimum of four hundred (400) pounds. They shall not interfere with snow chains.

COMPARTMENT FLOOR TILE

Each compartment floor, all shelving and slide trays in the apparatus body shall have Mateflex installed.

BREATHING AIR SYSTEM

AIR-COOLED, ELECTRIC DRIVEN COMPRESSOR

The compressor package shall be of horizontal configuration with all components mounted in a heavy duty, enclosed, structural steel frame engineered to absorb all stress imposed by operation, and guard against physical damage. The complete unit shall be factory assembled and tested to assure quality and reliability. It shall include the compressor, electric motor, purification system, controls, instrumentation, interconnecting piping and wiring as follows:

Compressor - The compressor block shall be four-stage, air-cooled, pressure oil lubricated of "V" configuration and rated for continuous duty at 6000 PSIG with a charging rate of 33.2 SCFM. Compressor systems requiring auxiliary cooling fans or cool down cycles shall not be acceptable. The crankcase shall be of all cast iron construction, fully enclosed and support an iron crankshaft with oversized ball bearings on each end. Only two connecting rods shall be utilized. Each connecting rod shall be equipped with needle bearings on each end for long life. All pistons shall be of the captive design, manufactured of aluminum or steel and incorporate rings on all stages. Cylinders shall be of aluminum or cast iron construction with deep cooling fins to provide maximum heat dissipation. The compressor flywheel shall incorporate a high velocity fan to remove heat from the compressor. Cooling airflow from the fan shall be a minimum of 5000 cfm. Individually mounted intercoolers shall be utilized after each stage of compression and the after cooler shall be designed to deliver final air at a temperature not to exceed 14 degrees Fahrenheit ambient. Suction and delivery valves shall be designed in such a manner that they can be repaired without replacing the entire assembly. Valve inspection covers are to be provided on the first and second stage cylinders. Relief valves shall be utilized after each stage of compression. The pressure lubrication system shall include a cam driven high pressure oil pump to supply metered quantities of lubricant directly to the fourth stage piston through a regulator and replaceable spin off type, full flow filter. The oil pump shall be driven directly off the crankshaft. Belt driven pumps shall not be acceptable. An oil level sight glass shall be provided for checking the crankcase oil level. An automatic drain system shall be supplied to periodically discharge accumulated condensation during operation and whenever the unit shuts down.

Electric motor - A NEMA design B, 2-pole, 25 horsepower, open drip proof motor shall be furnished for 3 phase, 60 hertz, 230 volts. The motor shall be mounted on a common base plate with the compressor supported to the frame by shock mounts to minimize vibration. The base plate shall incorporate slotted mounting holes and adjustment bolts to facilitate belt tension adjustment. The v-belt drive shall be guarded to meet OSHA requirements.

Purification system - The purification system shall be mounted on separate wall mount panel with the final separator located on the compressor frame. The purification system and replacement filter cartridges shall be manufactured by the same company as the compressor package. The system shall be a multi-chamber arrangement each constructed of 7075T6 anodized aluminum alloy with a tensile strength of 83,000 PSI and designed for 6000 PSI working pressure while maintaining a 4 to 1 safety factor. The first chamber shall be a mechanical separator to eliminate oil and water. Subsequent chambers shall utilize replaceable filter cartridges constructed of high strength, non- corrosive FDA grade polycarbonate plastic. Non-corrosive stainless steel springs and spin welded end caps shall be incorporated within the cartridge boundary. The cartridges shall be designed to remove vapor, hydrocarbons, noxious gases, taste and odor. Visual moisture and carbon monoxide indicators shall be provided after the final purifying chamber. Systems requiring chamber depressurization to check filter condition shall not be acceptable. Carbon monoxide shall also be eliminated by catalytic oxidation. The purification system shall process 136,000 cf before cartridge replacement. The air delivered shall meet CGA "E" quality.

Control system - The unit shall include all necessary controls to assure efficient operation and monitor compressor performance. All necessary electric motor controls shall also be included and rated for NEMA class 1. As a minimum, the control system shall include the following:

- Air pressure switch to automatically start and stop the unit in order to maintain system pressure.

- High air temperature shutdown switch.

- Low oil pressure shutdown switch.

- Magnetic, across-the-line starter with electric motor overload protection and 12 VDC control voltage.

- Power selector switch (auto/off) with power "on" light.

Instrumentation - The unit shall include all gauges necessary to indicate all normal and shutdown conditions. All gauges shall be mounted on a control panel centrally located on the front of the unit. All gauges shall be dry. As a minimum, the instrumentation panel shall include the following:

- Compressor interstage and final air pressure gauges.

- Oil pressure gauge.

- Hour meter.

- High air pressure shutdown light.

- High air temperature shutdown light.

- Low oil pressure shutdown light.

- Emergency stop button.

Low Pressure Regulator: A low-pressure regulator and outlet shall be located on the control panel. Regulator shall have a pressure range between 1 to 300 PSI.

Auto drain muffler/reservoir: An automatic drain muffler/reservoir system shall be provided manufactured of 14 gauge steel and designed to capture discharged condensation and to reduce the discharge noise level. A conveniently located valve shall be supplied to periodically drain the condensate accumulated in the muffler/reservoir at atmospheric pressure. The muffler reservoir shall be designed to mount under the truck chassis.

Air monitor panel: A remote mount air monitor panel shall be supplied including the following:

1. Cartridge monitoring system:

The cartridge monitoring system is designed to monitor the quality of air being discharged after the compressor's purification systems. The system continuously evaluates the moisture content of the purified air and also confirms the presence of the cartridge filter in the purification chamber. The complete system consists of the following:

A. Moisture monitor probe
B. photo cell cartridge detection sensor

C. Microprocessor control unit
D. Cartridge "ok" green light
E. Cartridge life warning light
F. Cartridge expired red warning and compressor shutdown
G. Install filter red warning

The cartridge monitoring system operating procedure is as follows:

- Cartridge detection: In the event that a cartridge filter is not installed in the purification chamber, the photo cell cartridge detection sensor (b) will not have a return signal to the microprocessor control unit (c), this will result in the illumination of the install filter red warning light (g) and the compressor will not start. This same condition will also occur in the event that any electrical connections in the system are faulty or otherwise not made. Note that mechanical devices, which could be subjected to corrosion, are not utilized.

- Moisture monitor: Upon start-up of the compressor, the moisture monitor probe (a) will continuously monitor the moisture content of the air stream at pressure. A timing device within the microprocessor control unit (a) is activated upon start-up to allow the moisture sensor to stabilize. This time cycle is operative for 8 to 20 minutes. During this cycle, the cartridge "ok" green light (d) will be flashing. Once the stabilization period is complete, the applicable status light for the moisture level will illuminate.

- Status light conditions:

  Cartridge "OK" green light (d): This light will remain illuminated as long as the moisture level in the air stream is within pre-set limits. This light flashes during the initial stabilization cycle.

  Cartridge life warning yellow light (e): This light will illuminate when the moisture level in the air stream approaches the pre-set limit. During this time, approximately one-hour duration, the air quality is within acceptable levels.

  Cartridge expired red warning light (f): This light will illuminate when the moisture level in the air stream exceeds the pre-set limit. The compressor unit shuts down under this condition.

- Adjustable timed cycles and moisture limits: All timed cycles and moisture limits which are not specified will be factory pre-set as follows:

- Eight to ten minutes for initial moisture probe stabilization.

- Approximately one hour for cartridge life warning. This cycle is not based on a timer but on actual moisture level detection. As such, this cycle is variable.

- The air stream moisture limit will be preset at -65 degrees F atmospheric dew point (24 ppm water vapor content) in accordance with recommendations by NFPA 1500. Other dew point limits can be set provided that the following are known:

  - Operating pressure
  - Mean ambient temperature

2. Carbon monoxide monitoring system:

- Shall be piped into the air flow downstream of the purification system
- Shall be mounted on a centrally located control panel.
- Shall be tamper-resistant requiring a keystroke sequence to access monitor controls.
- Must have a warning light, audible alarm & shutdown for high concentrations of CO.
- The keypad, with display prompter shall be comprised of four sealed keypads.
- Shall reliably detect co concentrations from 0 to 50 ppm. A digital readout shall continuously indicate the amount of CO in the compressed breathing air.
- Must be capable of adjustment at any point on the monitor between 0 to 20 ppm for shutdown.
- The unit shall automatically signal the operator when it is time for re-calibration. The time interval is adjustable.
- Calibration kit with 20 ppm CO is to be provided. Additionally, a cylinder with 0 ppm of CO shall be provided to conveniently and accurately calibrate the monitor.
- No calibration is required after changing the sensor module.
- The system shall come complete with a flow panel including flow meter, regulator, and a five-way valve

DOT AIR STORAGE

The breathing air storage system shall include eight DOT storage cylinders each with a minimum capacity of 430 cubic feet of air at 6000 PSIG. The system shall include all fittings, interconnecting piping, valves and hardware necessary to operate as a cascade system and meet all current DOT code requirements.

The DOT cylinders shall be mounted in a vertical rack in the L1 and R1 compartments. They shall be installed in a 2x2 fashion to allow maximum use of the compartment.

FRAGMENTATION CHAMBER

To provide maximum safety and performance, a totally enclosed fragmentation station shall be provided and installed in the rear operations compartment. This protective chamber shall be capable of charging two (2) SCBA cylinders simultaneously while two (2) SCBAs are attached and made ready outside the station. When the first set (two) SCBAs are filled they are revolved outside of the chamber while the two other cylinders, which were attached outside, are revolved into the chamber for filling.

The charge adapters are the "zip-nut" type, mounted approximately 28 inches above the floor, requiring only 16-18 inch SCBA lift. This will require “raising” the fragmentation chamber 12 inches from the floor. Appropriate shielding shall be installed to deflect any blast through the floor to the ground. The system shall contain safety interlocks, such that if the chamber is not closed and locked, air will not flow into the SCBAs. The lock charge lever manually locks the chamber, which in the turn automatically charges the SCBAs to pre-selected pressure.

The control panel shall contain "safety" gauges for monitoring the air pressure from the storage system and in the SCBAs being charged. An adjustable pressure regulator is provided to select the pressure for automatic SCBA charging. Safety relief valves prevent over charging. Bleed valves are provided in the charge adapters.

The air system hoses shall be designed for heavy-duty use, flexibility, and ease of connection with SCBA bottles. Provide a stainless steel hand wheel type connector.

SEQUENCER

The air distribution system shall incorporate a sequencer. It shall permit priority filling of SCBA tanks from the cascade storage banks without the need for an operator to open and shut valves.

Filling of a tank connected to the fill station starts from the low-pressure bank. As pressure in the tank being filled approaches pressure in the low bank the lower sequencer valve opens permitting filling from the medium bank. As pressure approaches that in the medium bank the upper sequencer valve opens permitting filling from the high-pressure bank. This continues until the tank being filled is full.

AIR CONTROL PANEL

The air control panel shall be brushed stainless steel located recessed in the front wall of the control “room”. The panel shall be hinged to the left and be lockable. The panel shall contain the following:

* The sequencer
* Engine monitor, which observes the following: oil pressure, water temperature, and voltage. It shall also alert the operator with audible and visual to any levels differing from the norm.
* All air operation control valves.
* Gauges depicting SCBA cylinder pressure, regulated pressure, cascade pressure and compressor pressure.
* A regulator for the fragmentation chamber.
* Gauge valve and regulator for the high pressure reel.
* Gauge valve and regulator for the low-pressure system.

INSTRUCTION LABELS

Plastic engraved labels, black with white letters, shall be provided. They shall describe the step-by-step instructions of how to operate the truck. The Chiefs Assn. Air Truck Committee shall be consulted as to how specific the labels are to be.

12 VOLT ELECTRICAL SYSTEM REQUIREMENTS

GENERAL REQUIREMENTS:

All electrical work shall be performed by persons familiar with emergency vehicle systems.

All of the emergency electrical equipment shall be served by circuits separate and distinct from the vehicle chassis circuits.

The 12-Volt DC electrical system shall be controlled by an industry proven electrical system.

WIRING REQUIREMENTS:

The complete 12-volt wiring system and electrical appliances shall meet NFPA 1901 minimum standards as well as standard automotive practices throughout its installation in the apparatus. The system shall comply with all the appropriate SAE recommended practices such as J1939 and/or J1708.

All required DC power conducting wiring shall be of GXL stranded copper wire of adequate gauge for the function served so as to ensure voltage drop of less than one volt at the appliance under full amperage load.

Body wiring shall be color and function coded, grease, oil and moisture resistant, routed in protective loom through protected locations, neatly and securely fastened, and all apertures properly grommeted for passing wiring. Solder less insulated connectors shall be provided where required. Primary wiring harnesses shall be bench assembled. Where crimp connections are necessary, the connections shall be made using approved connectors with heat shrink insulators. Any wiring routed within proximity of any exhaust components or other high temperature components shall be given special consideration and shielded for best protection.

Any required signal conductors shall be shielded twisted pairs rated by the system manufacturer to carry the multiplex command signals from the switch panel to the control modules.

ELECTRICAL MANAGEMENT SYSTEM:

The system installed shall be easily re-programmable and reconfigurable. Most factory authorized service centers or technicians will have on hand all required diagnostic hardware and software required for maintenance of the installed system.

PC DIAGNOSTICS

The system shall incorporate a feature that enables a service representative to troubleshoot, repair and replace nodes in the system, should they for any reason fail. It will be run via a PC interface and will monitor all system information. All messages going across the communications bus must be seen on the screen, including analog information. Each node must be capable of being queried for its own voltage drop and capable of obtaining the status of all inputs and outputs from the diagnostics interface.

The system shall feature the following:

- Total load management
- Load shedding capabilities (will begin load shedding when voltage drops below selected level after a 2-minute period per output.)
- Load sequencing capabilities
- PC Diagnostics
- Error reporting
- Continuous system monitoring and reporting

PC PROGRAMMING

The system must be programmable at the factory in a language that can be downloaded to a remote service representative's PC or down loader tool with all OEM data, as programmed for this specific unit and allow field reprogramming changes as provided by the unit manufacturer.

EMI/RFI PROTECTION

The electrical system proposed shall include means to control undesired electromagnetic and radio frequency emissions. State of the art electrical system design and components will be used to insure radiated and conducted EMI (electromagnetic interference) and RFI (radio frequency interference) emissions are suppressed at their source.
The unit proposed will have the ability to operate in the electromagnetic environment typically found in fire ground operations. The contractor will be able to demonstrate the EMI and RFI testing has been done and meets SAE J551 requirements. Harness and cable routing be given careful attention to minimize the potential for conducting and radiated EMI/RFI susceptibility.

CONTROLS & FUNCTIONS

A switch panel controlling electrical devices and equipment installed on the chassis and body shall be located in the cab within easy access to the driver or centrally located convenient to the driver and/or officer positions. The panel shall include switches arranged in the most convenient and practical manner that is possible.

The panel shall control individually all emergency warning light circuits, which shall also be controlled by warning master switch.

ELECTRICAL SYSTEM FEATURES

- Minimize use of control relays
- Provide control for NFPA 1901 mandated interlocks and indicators.
- Utilize system integration to eliminate redundant wiring and components.
- Improve control system reliability by reducing relay and contactor contacts.
- Advanced electrical system load management and sequencing system.
- Imbedded service interval information.
- Customized software programmed to reflect configuration.
- Field re-programmable to accommodate changes to the unit operating parameters.
- Fully Documented hardware

SERVICE AND MAINTENANCE DIAGNOSTIC

Advanced unit service and maintenance will be assisted with an integral software program. The software will provide troubleshooting tools to service technicians.

- Easy to understand diagnostic procedures.
- Automatic failure detection.
- Appropriate warning regarding components. System simulation and pinging of nodes for status verification.

All electrical and emergency lighting equipment and circuits not controlled by the electronic management system shall be supplied with automatic reset circuit breakers of appropriate amperage. These circuits shall be operated through a Bosch or equal continuous duty relay to remove load from all switches.

The apparatus shall have a Weldon V-MUX multiplexing system to provide diagnostic capability.

The Weldon 6231 Series Vista III Display Node will be included with the following features:

Outside temperature display.
A real time clock with display.
Three (3) programmable video inputs.
A useable temperature range from –40 degrees to 185 degrees F.
Unlimited virtual switches.
Selectable font sizes, types and colors for optimum user efficiency.
Selectable color buttons and screen backgrounds.

A Garmin Model 6550-0000-00, external GPS shall be integrated into the Vista 3231 above.

The color MUX Vista display will be mounted in the cab within reach of the driver's position.

The electrical system shall be pre-wired for computer modem accessibility to allow service personnel to easily plug in a modem to allow remote diagnostics, troubleshooting, or program additions.

There shall be a diagnostic display provided in the cab.

The multi-plexed system will use twisted-pair shielded wire within the electrical system for noise reduction.

The diagnostic display shall allow for fault and condition messages to be displayed.

The networked system shall meet the following minimum requirement components:

Power management center.
Load shedding power management
Solid-state circuitry
Switch input capability
Responsible for lighting device activation
Self-contained diagnostic indicators
Power distribution module
Diagnostic display for warning message indication

The wiring connections and terminations shall use a method that provides a positive mechanical and electrical connection and must be installed in accordance with the device manufacturer's instructions.

Electrical connections must be with mechanical type fasteners and rubber grommet where wiring passes through metal panels.

The wiring between the cab and body must be joined in an enclosed terminal junction panel.

All connections must be crimp-type with insulated shanks and heat shrink insulators to resist moisture.

BATTERY DISCONNECT SWITCH

A Cole Hersey brand 75908 master battery disconnect switch shall be installed in a convenient location to the driver.

BATTERY LIGHT

A green "battery on" pilot light that is visible from the driver's position shall be provided.

STOP / TAIL / TURN / BACKUP LIGHTS

Body shall be equipped with stop, tail, turn and back up lights as required by Federal Motor Vehicle Safety Standards.

New stop/tail, turn and back-up lights, shall be installed according to the FMVSS requirements. The stop, tail, turn light type used shall be Whelen brand 600 series L.E.D lights installed in cast aluminum housings mounted to the rear of the apparatus. The back up light shall remain halogen white.

CLEARANCE / MARKER LIGHTS (L.E.D)

The apparatus body shall be equipped Truck-Lite brand L.E.D marker lights. Lights shall be of the proper color and in accordance with the Federal Motor Vehicle Safety Standards (FMVSS).

A license bracket shall be provided at the rear of the unit with required lighting.

BACKUP ALARM

An Ecco brand backup alarm shall be installed and shall be activated when the unit is placed in reverse gear.

COMPARTMENT LIGHTS

A minimum of two (2) LED strip lights shall be installed per compartment door.
All lights shall be mounted in the body so that the adjustable shelves and trays can be easily moved without the moving of the lights and provide adequate illumination. All compartment lights shall be activated as that compartment door is opened.

COMPARTMENT OPEN LIGHT

A large red light shall be mounted in the cab visible from the driver's and officer's seat.

Each compartment door shall be equipped with a door open indicator switch. When contact is broken at these switches, it shall activate the compartment open light in the cab.

ENGINE COMPARTMENT LIGHT

There shall be one (1) light installed in the engine compartment to illuminate the engine area. There shall be a switch located adjacent to or on the light.

GROUND AREA LIGHTING

There shall be two (2) high intensity water resistant lights mounted under the unit to provide proper ground area illumination in areas designed for the personnel to climb onto or descend from the apparatus cab.

GROUND AREA LIGHTING

There shall be two (2) high intensity water resistant lights mounted under the unit to provide proper ground area illumination designed for the personnel to climb onto or descend from the apparatus tailboard.

LOAD MANAGEMENT

Electrical system shall feature an automatic load shedding system installed on the unit designed to meet and exceed all the requirements of NFPA 1901. The load management system monitors the vehicles battery voltage so if the voltage drops, outputs are individually de-energized. Load shedding is accomplished in two zones. One zone for lights that may be shed when on the road and the other for lights that may be shed at the scene. Selection of shedding modes is through the parking brake switch or the neutral safety switch.

Whenever the vehicle parking brake is set and “high idle” is selected, a low voltage will produce a high idle output before shedding any loads. High idle will continue for 2 minutes after the voltage rises to eliminate engine speed cycling. High idle is immediately reset when the high idle switch is turned off or the parking brake released.

A high voltage detector is provided to detect when the sensed voltage exceeds 15 volts. High voltage, low voltage and load shedding set points are individually field adjustable.

Load manager provides a low voltage alarm with time delay.

BATTERY CONDITIONER / AIR PUMP

There shall be one (1) Kussmaul Pump Plus Super Kit 091-9-1000-S kit installed on the chassis. It shall consist of an air compressor, Auto Charge1000 120 volt AC battery conditioner with a Super Auto Eject, and remote bar graph.

The battery conditioner (charger) system shall be wired to the chassis batteries and will recharge them to required levels. Conditioner shall provide a full 15 amps of output as well as supplying up to 3 amps for loads connected directly to the battery such as radio memory, etc.

System shall be connected through a 110 volt shoreline inlet or receptacle located on the cab. A 10 element LED charge indicator shall be mounted on the driver's side of the cab near the shoreline inlet.

The shoreline inlet shall be a Kussmaul Super Auto-Eject input connector with a weather proof, sealed box and cover. Auto Eject is designed to connect a 120-volt AC source to the vehicle. Unit shall automatically disconnect 120 volt AC power source by ejecting plug from the receptacle when vehicle-starting system has been energized. Super eject shall be installed on the driver's side in a location to be determined by Kenton County.

The air compressor maintains the air pressure in the air brake system while the vehicle is not in use. The battery charger is designed to maintain fully charged batteries in the vehicle. The batteries are automatically charged and shall be maintained fully charged.

LIGHT BAR

A Whelen model FN60QLED 60" L.E.D. light bar shall be installed on the cab roof of the unit. There shall be four (4) red corner linear12 L.E.D light heads, and four (4) front linear8 L.E.D light heads. Two (2) red, and two (2) white L.E.D's. Square Ends.

LOWER ZONE WARNING LIGHTS

A Whelen NFPA 1901 L.E.D. lower zone warning light package shall be installed on the unit.

There shall be a total of eight (8) 60R00FRR 600 series L.E.D. surface mount lights mounted on the unit. Each light shall be equipped with a chrome 6E series flange. Lights shall be mounted as follows:

There shall be three (3) red 60R00FRR lights mounted on each side in the lower half of the unit (zones B & D lower); two (2) red 60R00FRR lights shall be mounted on the rear lower half of the unit (zone C lower); and two (2) red Power Arc LED180H-1R lights with cast housings shall be mounted on the grille (zone A lower).

UPPER ZONE WARNING LIGHTS

A Whelen NFPA 1901 L.E.D. upper zone warning light package shall be installed on the unit.

There shall be a total of six (6) 90R00FRR 900 series L.E.D. and two (2) 70R00FRR surface mount lights mounted on the unit. Each light shall be equipped with a chrome flange. Lights shall be mounted as follows:

There shall be two (2) red 90R00FRR lights mounted on each side in the upper half of the body (zones B & D upper); two (2) red 90R00FRR lights and two (2) red 70R00FRR lights shall be mounted on the rear upper half of the unit (zone C upper)

WARNING LIGHTING - MODES OF OPERATION

There shall be two modes of operation, calling for the right-of-way and blocking the right-of-way. When the master optical; warning system switch is closed, and the parking brake is released or the automatic transmission is not in park, the warning devices signaling the call for right-of-way shall be energized. When the master optical warning system switch is closed, and

the parking brake is on or the automatic transmission is in park, the warning devices signaling the blockage of the right-of-way shall be energized.

ELECTRONIC SIREN

There shall be one (1) Whelen model WS-295 electronic with noise canceling microphone shall be installed in the cab area.

SPEAKER

There shall be two (2) compact Cast Product SH2015 flush mount speaker with 100-watt driver and a polished finish will be supplied. It will be recessed in the front chassis bumper in a specified location.

SCENE LIGHTS

The unit shall be equipped with two (2) Whelen 810 series 8-32 degree halogen lights. The two (2) shall be surface mounted lights and located per Kenton County.

SCENE LIGHTS ACTIVATED IN REVERSE

The rear scene lights shall be activated when the unit is placed in reverse. This mode is in addition to the switches provided in the cab and/or at the lights.

120 VOLT & 240 VOLT REQUIREMENTS

Since the apparatus is equipped with a 120/240-volt electrical system, the system shall be installed to the required level of safety and protection to the fire apparatus. The complete wiring and electrical installation shall conform to the current National Electrical Code (NEMA) applicable to mobile applications, except where superseded by NFPA. #1901.

Electrical fixtures, components, and wiring shall be to the highest industry quality standards available. All equipment shall be the type as designed for mobile type installations subject to vibration, moisture, and severe continuous usage.

All 120/240 volt electrical wiring rated at 20 amps and higher shall be fine stranded copper type DLOC rated to 2000 volts. DLOC cable is much more flexible for mobile routing applications. The wire shall be sized to load and circuit breaker rating.

Electrical cables or conduit shall not be attached to chassis suspension components, water, fuel or brake lines. Electric wiring or harnesses shall not be within 12 inches of any exhaust system component or 6 inches of fuel lines.

The wiring, electrical fixtures and components shall be to the highest industry quality standards available on the domestic market. The equipment shall be the type as designed for mobile-type installations subject to vibration, moisture and serve continuous usage.

All 120 / 240 volt wiring shall be run through Liquid tight flexible non-metallic conduit wherever wiring is run. Conduit shall have a UL Rating of 80℃ Dry, 60℃ Wet, 70℃, Oil Resistant, Sunlight Resistant, CSA Rating - 18℃ to 75℃. Liquid tight straight and right angle connections to be used wherever applicable.

Exterior outlets specified herein shall be mounted in cast aluminum or zinc die cast boxes with weather resistant snap open covers. An isolation gasket shall be used whenever any portion of the outlet or covers comes into contact with a body panel.

Where receptacles are provided in possible wet locations, the receptacle outlet and inlet devices, including those on hardwired remote power distribution boxes, shall be of grounding type provided with a wet location cover and installed in accordance with NEC.

All receptacles shall be marked with the type of line voltage (120 volts or 240 volts) and the current rating in amps.

The wiring and associated receptacles shall be subjected to a 1-min, 900-V dielectric voltage withstand test with any switches in the circuit(s) closed between live parts, including neutral and the vehicle frame. This test shall be conducted after all bodywork has been completed.

Electrical polarity checks shall be made of permanently wired equipment and receptacles to determine that connections have been properly made.

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

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

GROUNDING

Grounding will be in accordance with Section 250-34 "Portable and Vehicle Mounted Generators" of the NEC. Ungrounded system will not be used. Only stranded or braided conductors will be used for grounding and bonding.

The grounded current carrying conductor (neutral) will be insulated from the equipment grounding conductors and from the equipment enclosures and other grounded parts. The neutral conductor will be colored white or gray in accordance with Section 200-6 (Means of Identifying Grounding Conductors) of NFPA 70.

Electrical polarity checks shall be made of permanently wired equipment and receptacles to determine that connections have been properly made.

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

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

TESTING

The generator and all related electrical systems shall be independently tested and certified. The tests shall conform to NFPA 1901 as specified. The recorded test forms shall be supplied with the completed apparatus with the owners / service manuals.

GENERATOR

A 100 KW generator shall be installed on the unit. It shall be a Marathon Electric, Lima Mac Model 440 MSL.

The apparatus shall be equipped with a complete electrical power system. The wiring and generator installation shall conform to the present American National Standard Institute (ANSI) of the National Fire Protect Association.

The installation shall be designed for continuous operation without over heating and undue stress on components.

The system shall utilize a generator drive system to power the generator.

The generator system shall be mounted between the chassis frame rails (using the minimum amount of compartment space within the body) on heavy steel channels and angles. The unit shall be mounted high to provide good road clearance. The mounting shall allow ease of removal for future servicing should it become necessary.

DRIVE SYSTEM

The generator shall be driven by a Hale driveline transfer case Model MGA installed inside the frame rails of the chassis using steel brackets mounted and braced to the chassis frame. The installation shall be performed by companies with experienced personnel whom perform this type of modification on regular basis. The factory driveline shall be interrupted aft the transmission to provide the maximum power output to drive the 100 KW generator. A new balanced hollow tube shaft with exact replacement heavy duty universal joints shall be provided on either side of the transfer case as well as one to the generator. The auxiliary output shaft shall be a 2" 10 spline rigidly supported by full ball bearings for minimum deflection.

The transfer case gearbox housing shall be constructed from a fine grain cast iron alloy. The gear case shall feature electric furnace chrome nickel steel gears, with bores ground to size and teeth integrated. Teeth shall be crown shaven and hardened for smooth performance and long life. Gear design shall minimize potential end thrust. The shafts shall be 2.75" diameter heat-treated, chrome nickel steel designed to withstand maximum engine torque in all operating conditions. Shaft flanges on the input and output shafts shall be one-piece design. Each shaft shall be multi-piloted and multi drilled for Spicer compatibility. Double lip oil seals shall be provided at both shafts to prevent gearbox contamination. They shall also be easily serviced while on the truck.

An air power automatic shift selector shall be provided to operate the transfer case. The selector shall be mounted in the cab with in easy reach of the driver. It shall provide positions for road or PTO operations.

The substitution of a diesel or gasoline generator shall not be acceptable due to weight, size and noise levels.

The system shall require little or no maintenance of any type on the drive system or generator unit.

All components of the electrical and generator drive system shall be available on the domestic market, of top quality and of industrial grade for long-term ease of maintenance or overhaul.

The direct drive generator unit provided shall have the output of the generator system controlled by an electronic governor. An electrical instrument gauge panel shall be provided (as described later in the specifications) for the operator to monitor and control all electrical operations and output.

An electronic monitoring device shall be installed on the apparatus to monitor the generator electrical system. It shall comply with NFPA requirements for instrumentation on a line voltage power source rated at 8 kW or larger. (NFPA 1901, 2003 Edition, 23.4.6.3.)

The FROG-D is a digital device that can be used to monitor 120 or 240-volt systems. The small, waterproof, digital display shows Frequency (in Hertz) accurate to 1 decimal point, Current (in Amps) on two separate lines, and Voltage (in Volts AC). It also features a Warning System function. It constantly monitors inputs and provides a visual warning alarm when a value goes out of normal range. An output is available to connect an optional audible alarm.

The controller shall be installed in a protected area accessible for adjustment by a qualified electrical technician.

Generator and throttle control engagement shall be confirmed by an illumination of a cab mounted indicator light.

The system shall be installed by highly qualified electrical technicians to assure the required level of safety and protection to the fire apparatus operators.

The above electrical equipment, fixtures, components and wire shall be the minimum acceptable quality standard for this apparatus:

All electrical wiring shall be fine multi-Stranded copper type. S.O. and house type romex cable is not acceptable even if loomed or run in conduit. The wire shall be sized to load and circuit breaker rating: 10 gauge on 30 amp circuits, 12 gauge on 20 amp circuits, and 14 gauge on 15 amp circuits.

All 110/220V wiring shall be run in Type B UL approved liquid tight flexible nonmetallic conduit. The following must have the minimum specifications as follows. It shall outdoor-direct burial 80 degree C dry, 60 degree C wet, 70 degree C oil resist. Only Liquid tight fittings USED NO EXCEPTIONS.

It shall be ran in corner areas in extruded aluminum pathways built into the body for easy access and maximum protection. All wiring shall be color coded and number coded.

All wiring shall be both color and number coded in the electrical installation for easy identification and future servicing.

All circuit breakers shall be properly labeled. In addition, a plastic directory shall be on the generator compartment door or panel with wiring system and circuit breaker numbering and description. Exterior and interior outlets shall be labeled with a metal or plastic engraved tag to its use and voltage.

LOAD CENTER / BREAKER BOX

A minimum sixteen (16) place Square D QO series circuit breaker box / load center shall be installed in the air control “room” compartment. The breaker box shall be rated at a minimum of 100 amps and supplied with one (1) main breaker rated for the maximum amperage output of the specified generator. Load center shall feature:

- Exclusive shielded copper bus features electro tin plated copper bus bars sandwiched between two rugged polymer shields to insulate and secure the interior.
- Straight-in mains wiring and uniform termination lugs help minimize service cable bends, cutting waste and saving installation time.
- Convertible mains allow fast field conversion between main breaker and main lugs to meet changing job requirements.
- Single, captive interior mounting screw can't be lost. Interior mounts quickly and can easily be removed during rough in for paint or theft protection.
- Split branch neutral with up to 50% more terminations than UL requirement simplifies wiring and reduces clutter.

Specified breakers, as outlined herein, shall be compatible for installation in the box

Circuit breakers shall be Square D type QO (plug-on) thermal magnetic trip, with an integral crossbar to ensure simultaneous opening of all poles in multi-pole circuit breakers. Breakers shall feature:

- An over center, trip free, toggle-type operating mechanism with quick-make, quick-break action and positive handle indication.
- Handles with ON, OFF, and "Tripped" positions. In addition,
- A trip indication shall be provided on the breakers. The Square D VISI-TRIP indicator appearing in the window of the circuit breaker case.
- Circuit breakers shall be UL Listed in accordance with UL standard 489 with current ratings as noted on the plans. Interrupting ratings shall be selected to provide the required load center short circuit current rating.

Each breaker shall be rated to specified wire size and load demand required for each item operated from load center.

ELECTRICAL RECEPTACLES (120 VOLT, STRAIGHT BLADE, 15AMP)

There shall be two (2) duplex, 15 amp, straight blade electrical receptacle(s) mounted in a wall box inside the compartment.

RECEPTACLES

There shall be two (2) duplex 15 amp receptacles installed in the rear wheel well area. The receptacles shall be recessed in the body and be protected by a weatherproof cover. The receptacles are to be straight blade, the plug configuration used by Kenton County.

650-WATT GFE QUARTZ LIGHT (BETA LIGHT HEAD)

There shall be eight (8) GFE Extend-A-Lite HD-4650 Low Profile Quartz light head(s) provided. Each light head shall be equipped with a 650-watt quartz bulb, top mounted handle and tilt knob assembly.

Each light head shall be mounted to a GFE E-POD-W tripod Extenda-pole assembly. Each tripod assembly shall be constructed with a 4' aluminum extension pole with sturdy tripod base. Tripod is capable of 11' maximum extended height.

Provisions shall be provided for interior mounting of all six tri-pods in the over the wheel compartment.

1000-WATT FRC RECESSED WALL MOUNT LIGHT

There shall be three (3) 1000 watt 120 volt FRC Focus quartz lights, model FCA200-M10 wall mount quartz lights recessed into the body head rail. Light dimensions shall be 16.125" x 5.375" x 2", and be finished with a powder coat white finish. Each light shall provide even light distribution by focusing 100% of the light to the work area. All lights shall provide quick and simplified bulb replacement from the front by removal of just the lens cover.

Lights shall be located as follows: One on each side of the body and one located on the rear.

LIGHT TOWER

There will be two (2) Will-Burt roof mounted elevated lighting systems installed on the roof of the body. The light model shall be the Night Scan NS-15-9000. It shall extend 15 feet from the roof of the body.

Each light tower shall be equipped with six (6) 1500 watt 230 volt quartz lights. Erection of the light shall be by air pressure derived from the truck chassis. The 12-volt D.C. current required for the controller shall also be obtained from the chassis.

The remote control shall be a pistol grip type with 30 feet of cable. The remote shall be stored against the wall of the center compartment. A bracket shall be supplied for both the controller and the cable.

A protective fairing shall be installed in the front of the Night Scan to protect it from tree branches or other obstructions.

ELECTRIC REEL (120-VOLT)

Four (4) 120-volt cord reels shall be installed. They shall be a Hannay Model ECR 120 volt, capable of holding 300 feet of 10/3. Wire shall be provided with the apparatus. Each reel shall also be equipped with a 12-volt electric motor with a sealed push button momentary switch located near that reel in the same compartment.

JUNCTION BOX

A Circle “D” model junction box with weather resistant covers or equivalent junction box shall be provided on each specified reel. Each box shall contain two receptacles with a spring loaded snap cover. Plug configuration shall be normal straight blade.

AIR REEL

The air reel shall be a Hannay model EF series high-pressure reel capable of holding 200 feet of 1/4" hose. The reel shall also be equipped with a 12-volt electric motor with a sealed push button momentary switch located near that reel in that same compartment.

CAPTIVE ROLLER

There shall be a fairlead located at each specified reel location. The fairlead shall be a retractable captive 4-way roller fairlead. These devices shall be so designed as to extend out of the body when the roll-up door is opened. This shall eliminate the cable or hose from rubbing against the exterior painted body surface. This device shall be activated by simply pulling it out from the body with a web strap. The design shall also not allow the cable or hose to be deployed without the device being swung out.

PAINT PREPARATION

The body exterior shall have no mounted components prior to painting to assure full coverage of metal treatments. Trim, cover plates, and external equipment being painted job color will be removed and painted separately from the body. All compartment doors (if applicable) will be painted separately to assure proper paint coverage on body, doorjambs and door edges.

All painted surfaces shall follow the following procedure to insure a lasting finish.

Metal surfaces shall be sanded to remove all burrs and imperfections in aluminum, before etching other surface contaminants and treatment. The entire unit shall be power washed and dried off. All surfaces shall be air blown dry completely.

A PPG wax & grease solvent shall be used to clean and prep the aluminum surfaces to be painted. The surfaces shall then be rinsed with freshwater and air blown dry. This step removes wax, grease and thus leaving a bright, clean and conditioned surface.

A self-etching, aluminum primer shall be applied next. The self-etching primer shall fill all of the minor imperfections, scratches, etc. in the metal. This step produces a corrosion resisting conversion coating that fends off oxidation and other surface contaminates leaving a surface that gives excellent paint adhesion.

A sandable primer shall be sprayed on the metal that seals the surface for the polyurethane paint. A minimum coating thickness of 2 mil shall be applied. Primer is then sanded smooth leaving the best surface for topcoat.
The apparatus body shall then be painted with a minimum of two (2) coats of PPG Delta high solids DUHS paint to insure paint depth. Color finish shall be force dried at 120 degrees Fahrenheit. Color coat shall then be spray coated with a minimum of two (2) coats of Delta urethane clear finish.

The finish shall be buffed out to a high luster finish, while removing any dust, or imperfections.

These steps are followed as recommended by the paint manufacturer to provide a lasting and high quality gloss finish. All paint products shall be provided by the same manufacture as the topcoat finish.

The body shall be painted 1 color red, code to be supplied by Kenton County upon award.

STRIPE

There shall be a 4" wide with a ¾" space then two 1" wide white Scotchlite stripe located no higher than 48" from the ground installed on the apparatus cab and body. The stripe shall cover a minimum of fifty percent (50%) of perimeter of each side of the apparatus and fifty percent (50%) of the perimeter of the rear of the apparatus and twenty-five (25%) of the perimeter of the front of the apparatus. Kenton County shall specify the exact location of the stripe.

LETTERING

The lettering on the unit shall be gold reflective with left drop shadow. It shall consist of both cab doors with the official seal of Kenton County. Along with 3" tall letters "Fire Chiefs Assn.". In the stripe below it shall be 3" blue letters "Air 1".

On the upper panel of the body sides 8" letters saying "Air & Light Unit" shall be installed.

On the rear doors 4" letters saying "Kenton County Air & Light Unit" shall be installed.

MISCELLANEOUS EQUIPMENT

WHEEL CHOCK

There shall be two (2) Zico model SAC-44 wheel chocks with a horizontal hanging bracket shall be mounted in front of the left rear wheels.

SCBA CARRIERS

Two (2) Quic-Carry air caddy cylinder carrying strap systems shall be supplied.

EXTENSION CORDS

There shall be eight (8) 50 foot 16-3 extension cords supplied.

REAR VISION CAMERA

A Weldon Brand Vista III 6500 Series back up camera system shall be installed, it shall automatically activate when truck is placed in reverse. The viewing screen shall be located in a mutually agreeable location.

WIRING SCHEMATICS

A complete set of detailed electrical wiring schematics shall be provided with the completed unit. The schematic shall clearly labeled and describe all electrical circuits for an accurate reference.

SERVICE MANUAL AND PARTS LIST

A service manual shall be provided with the completed unit. Manual shall include equipment and component information as well as warranty and service information.