

TOWN of VERNON FIRE DEPARTMENT HD RESCUE SPECIFICATIONS

**Legal Notice
Town of Vernon
Contract# 985-07/05/2011**

STANDARD INSTRUCTIONS TO BIDDERS

These instructions are standard for all proposals issued by the Town of Vernon, Connecticut for the purchase of 2 Fire Pumpers and 1 Heavy Duty Rescue Truck. The Town may delete, supersede or modify any of these standard instructions for a particular proposal by indicating such change in a section entitled “Special Instruction To Bidders”.

- 1. The attached proposal is general specifications, conditions and requirements of this bid.**
- 2. Proposals must be submitted on the enclosed form with any required bid security.**
- 3. Bids shall be submitted in sealed envelope shall be addressed to the Town Administrator, 14 Park Place, Vernon, Connecticut 06066 and shall be clearly marked “BID DOCUMENT – DO NOT OPEN”. The bid envelope shall indicate the contract number as shown on the “Invitation To Bid”.**
- 4. Bids received later than the time and date specified in the “Invitation To Bid” will not be considered. Withdrawals of bids, received later than the time and date set for the bid opening, will not be considered.**
- 5. All deliveries of commodities hereunder shall comply in every respect with all applicable laws of Federal Government and the State of Connecticut.**
- 6. The bidder shall insert the price per stated unit and extend a total price for each item. IN THE EVENT THAT THERE IS A DISCREPANCY BETWEEN THE UNIT PRICE AND THE TOTAL PRICE EXTENSION, THE UNIT PRICE WILL GOVERN.**
- 7. In accordance with the provisions of Section 12-412 (a) of Connecticut General Statutes, the Town of Vernon is exempt from the payment of Federal or State tax and such tax or taxes shall not be included in bid prices.**
- 8. Unless otherwise stated herein, all deliveries made under this contract must consist of new merchandise.**

9. The Town reserves the right to reject any and all bids, wholly or in part, to waive technical defects and to make awards in the manner deemed to be in the best interests of the Town.

10. The Town will not accept any additional charges for freight or shipping.

11. All bids must be accompanied by bid security in the sum of not less than ten percent (10%) of the total bid and shall be in the form of a bid bond, a certified check, a treasurer's or cashier's check drawn on a National or State bank or trust company and shall be made payable to the "Town of Vernon".

12. The bid security shall secure the execution of the contract by the successful bidder.

13. Should any bidder to whom an award is made fail to enter into a contract within ten (10) days, exclusive of Saturdays, Sundays and legal Holidays, after notice of the award has been mailed to the bidder, the amount so received from the bidder through his/her bond shall become the property of the Town of Vernon, Connecticut as liquidated damages for failure.

14. The bid security of the successful bidder shall be held until such time as all conditions of the proposal have been met.

15. Copies of the RFP are available from the office of the Town Administrator from 9:00 a.m. until 4:30 p.m., Monday through Wednesday, 9:00 a.m. until 7:00 p.m. on Thursday, and 9:00 a.m. until 1:00 p.m. on Friday; or anytime online at <http://www.vernon-ct.gov/legal-notices> with reference to Contract #985-07/5/2011.

16. All questions about the proposals should be directed to John D. Ward, Town Administrator, by e-mail at jward@vernon-ct.gov, with copies to William Call, Fire Chief, by e-mail at wcall@vernon-ct.gov, no later than 3:30 p.m. June 27, 2011. Answers to all so received questions shall be posted by June 30, 2011 on the Town's website under the bid section at <http://www.vernon-ct.gov/legal-notices> with the Contract #985-06/30/2011.

17. The selected firm must meet all municipal, state and federal AA and EEO practices and requirements. MBEs/WBEs/SBEs are encouraged to apply. The Town reserves the right to reject any or all proposals in whole or part, to award any one service or group of services or all services, to negotiate with any or all companies submitting proposals, and to enter into an agreement with any company for any services mentioned in this RFP; if it is deemed to be in the best interest of the Town.

John Ward

Town Administrator

**Proposals will be required to be submitted to the Town of Vernon prior to the date and time listed above. Proposals will be opened on July 5, 2011
You are not required to be present at the opening.**

This document contains the following:

I. Instructions to Proposers and Specifications

II. Required Forms

- a. Certificate of Non-Collusion**
- b. Proposal Price Form**
- c. Sample Agreement**
- d. References**

III. Technical Specifications

NOTE #1: Proposals submitted without the required information will not be considered.

NOTE #2: Proposals received after the specified deadline for the bid opening will not be opened.

NOTE #3: Please submit four (2) complete written copies of your proposal

NOTE #4: Please submit one (1) complete copy of your proposal on a CD in Word or PDF format.

NOTE #5: Proposal prices must be firm for a period of at least 60 days beyond July 5, 2011

It is the intent of the Town of Vernon to enter into a contract to supply and deliver vehicles based on the attached specifications. The Town of Vernon reserves the right to accept or reject any or all proposals as deemed in the best interest of the Town of Vernon and not necessarily the lowest submitted price proposal.

SECTION II - REQUIRED FORMS CHECK LIST

The following forms are required:

- ___ **Certificate of Non-Collusion – (fill in attached form)**
- ___ **10% Bid Bond – At time of contract signing.**
- ___ **Insurance Certificate in Purchaser’s Name – (bidder to supply)**
- ___ **Statement of included Warranties – (fill in attached form)**
- ___ **Bid Price Form – (fill in attached form)**
- ___ **Vehicle Weight & Balance Statement**
- ___ **Authority to Sign Bid Form – (bidder to supply)**
- ___ **Sample Agreement – (bidder to supply)**
- ___ **References – (fill in attached form)**
- ___ **Manufacturer Equal Opportunity Statement - (bidder to supply)**
- ___ **Service Center EVT Certificates – (bidder to supply)**
- ___ **Chassis Manufacturer Authorized Service Center Letter**
- ___ **Bidders Letter detailing Service Center Capabilities**
- ___ **Bidders to supply a company financial statement for the last 5 years**
- ___ **Bidders to supply pricing as an option for mounting equipment on the 3 vehicles.**

CERTIFICATION OF GOOD FAITH

The undersigned certifies under pains and penalties of perjury that this contract has been obtained in good faith and without collusion or fraud with any other person. As used in this certification, the word “person” shall mean any natural person, business, partnership, corporation, union, committee, club, or other organization, entity, or group of individuals.

CONTRACTOR

By: _____

Name: _____.

Title: _____

Statement of Included Warrantees

APPARATUS BUILDER

Name: _____
Address: _____
City: _____
State: _____
Zip: _____
Phone: _____
Fax: _____
Website: _____

Bidders to state the years and/or mileage for the warrantees listed below:

- General Vehicle** _____
- Chassis Cab** _____
- Chassis Frame** _____
- Chassis Cross members** _____
- Chassis Cab Paint** _____
- Engine** _____
- Transmission** _____
- Axles** _____
- Fire Pump** _____
- Booster Tank** _____
- Apparatus Body** _____
- Apparatus Body Paint** _____
- Pump Gauges** _____
- Pump Valves** _____
- Pump Plumbing** _____
- Generator** _____
- Warning Lights** _____

Bid Price Form

Date:
Bidder Name:
Address:
City:
State:
Zip:
Phone:
Fax:
Website:
Contact Name:
Body Model:
Chassis Model:

Bid Price:

Prepayment Option

Discount Offered for 100% Chassis Payment:
Do not include in the bid price

Chassis Payment Amount:
Delivery time in calendar days from contract acceptance:

Authorized Signature of Bidder

References

Provide six (6) references in New England within the last two (2) years who have purchased a similar vehicle. Include Contact Name and phone number.

- 1).
- 2).
- 3).
- 4).
- 5).
- 6).

The following paragraphs will describe in detail the apparatus proposed. It meets the applicable requirements of the National Fire Protection Association (NFPA) as stated in current edition at time of contract execution, except where amended by your specifications. Loose equipment not specifically requested will not be provided.

DELIVERY

The apparatus will be delivered under its own power to insure proper break-in of all components while the apparatus is still under warranty.

SAFETY VIDEO

At the time of delivery a video will also provide one 39-minute, professionally-produced apparatus safety video, in DVD format. This video will address key safety considerations for personnel to follow when they are driving, operating, and maintaining the apparatus, including the following: vehicle pre-trip inspection, chassis operation, and safety during maintenance.

INFORMATION

The manufacturer will supply at time of delivery, complete operation and maintenance manuals covering the completed apparatus as delivered. A permanent plate will be mounted in the driver's compartment which specifies the quantity and type of fluids required including engine oil, engine coolant, transmission and drive axle.

PERFORMANCE TESTS

A road test will be conducted with the apparatus fully loaded and a continuous run of no less than ten miles. During that time the apparatus will show no loss of power nor will it overheat. The transmission drive shaft or shafts and the axles will run quietly and be free of abnormal vibration or noise. The apparatus will meet NFPA 1901 acceleration requirements and NFPA 1901 braking requirements. The apparatus when fully loaded will not have less than 25 percent nor more than 50 percent on the front axle and not less than 50 percent nor more than 75 percent on the rear axle.

ISO COMPLIANCE

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

COMMERCIAL GENERAL LIABILITY INSURANCE

Certification of insurance coverage will be enclosed.

SINGLE SOURCE MANUFACTURER

Bids shall only be accepted from a single source apparatus manufacturer. The definition of single source is a manufacturer that designs and manufactures their products using an integrated approach, including the chassis, cab and body being fabricated and assembled on the bidder's premises. The warranties relative to the chassis and body design (excluding component warranties such as engine, transmission, axles, pump, etc.) must be from a single source manufacturer and not split between manufacturers (i.e. body and chassis). The bidder shall provide evidence that they comply with this requirement.

NFPA 2009 STANDARDS

This unit will comply with the NFPA standards effective January 1, 2009, except for fire department directed exceptions. These exceptions will be set forth in the Statement of Exceptions.

Certification of slip resistance of all stepping, standing and walking surfaces will be supplied with delivery of the apparatus.

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

The manufacturer will have programs in place for training, proficiency testing and performance for any staff involved with certifications.

An official of the company will designate, in writing, who is qualified to witness and certify test results.

NFPA COMPLIANCY

Apparatus proposed by the bidder will meet the applicable requirements of the National Fire Protection Association (NFPA) as stated in current edition at time of contract execution. Fire department's specifications that differ from NFPA specifications will be indicated in the proposal as "non-NFPA".

TOTAL VEHICLE ASSESSMENT CERTIFICATION

The apparatus will be third-party, independent, audit-certified through Underwriters Laboratory (UL) to the current edition of NFPA 1901 standards. The certification includes: all design, production, operational and performance testing of the apparatus.

GENERATOR TEST

If the unit has a generator, the generator will be tested, approved, and certified by Underwriters Laboratories at the manufacturer's expense. The test results will be provided to the Fire Department at the time of delivery.

BREATHING AIR TEST

If the unit has breathing air, Underwriters Laboratories will draw an air sample from the air system and certify that the air quality meets the requirements of NFPA 1989, *Standard on Breathing Air Quality for Fire and Emergency Services Respiratory Protection*.

Technical Support Screens

APPROVAL DRAWING

A drawing of the proposed apparatus will be prepared and provided to the purchaser for approval before construction begins. A sales representative will also be provided with a copy of the same drawing. The finalized and approved drawing will become part of the contract documents. This drawing will indicate the chassis make and model, location of the lights, siren, horns, compartments, major components, etc.

A "revised" approval drawing of the apparatus will be prepared and submitted by Pierce to the purchaser showing any changes made to the approval drawing.

INSPECTION TRIP(S)

The bidder will provide one (1) factory inspection trip(s) for one customer representative(s). The inspection trip(s) will be scheduled at times mutually agreed upon between the manufacturer's representative and the customer. All costs such as travel, lodging and meals will be the responsibility of the bidder.

INSPECTION TRIP(S)

The bidder will provide one (1) factory inspection trip(s) for two [2] customer representative(s). The inspection trip(s) will be scheduled at times mutually agreed upon between the manufacturer's representative and the customer. All costs such as travel, lodging and meals will be the responsibility of the bidder.

ONE (1) YEAR MATERIAL AND WORKMANSHIP

An apparatus limited warranty certificate, WA0008, is included with this proposal.

BID BOND

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

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

PERFORMANCE BOND

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

SERVICE CENTER

Each bidder is required to have a Connecticut Fire Apparatus Service Center that is equipped with a minimum of Five (5) ASE & EVT certified technicians. This service center shall be owned and operated by the bidder to allow for immediate warranty service. Dealers that utilize subcontractors for service shall take exception to this requirement. The service center shall offer 24HR 7 day per week "on the road" service via a toll free (1-800) number. The service centers road service vehicle shall be equipped with a Pro Link Diagnostic Microprocessor as well as all necessary parts required for normal chassis and pump service. In the event the apparatus needs to be transported to the service center for warranty or non warranty service, the service center shall pick up and deliver the apparatus from the firehouse free of charge.

The service center shall give the unit a complete chassis and pump service after the unit arrives in Connecticut and prior to being delivered to the customer. This chassis service shall consist of full Engine Oil & Filter change, Chassis Lube, Fuel Filter Change, Brake Adjustment, U-bolt Retorque, Wheel Retorque, Pump Vacuum Test, Pump Operational Check (all valves), Lube Pump and all valves and linkages, Foam system test (if equipped) and road test.

FRAME

The chassis frame will be built with two (2) steel channels bolted to five (5) cross members or more, depending on other options of the apparatus. The side rails will have a 13.38" tall web over the front and mid sections of the chassis, with a continuous smooth taper to 10.75" over the rear axle. Each rail will have a section modulus of 25.992 cubic inches and a resisting bending moment (rbm) of 3,119,040 in-lb over the critical regions of the frame assembly, with a section modulus of 18.96 cubic inches with an rbm of 2,275,200 in-lb over the rear axle. The frame rails will be constructed of 120,000 psi yield strength heat-treated .38" thick steel, with 3.50" wide flanges.

FRAME REINFORCEMENT

In addition, a mainframe inverted "L" liner will be provided. It will be heat-treated steel measuring 12.00" x 3.00" x .25". Each liner will have a section modulus of 7.795 cubic inches, yield strength of 110,000 psi, and rbm of 857,462 in-lb. Total rbm at wheelbase center will be 3,976,502 pounds per rail.

The frame liner will be mounted inside of the chassis frame rail and extend the full length of the frame.

SEATING CAPACITY

The seating capacity in the cab will be four (6).

FRONT AXLE

The front axle will be a reverse "I" beam type with inclined king pins. It will be a Meritor™ axle, Model FL-943, with a rated capacity of 21,500 lb.

The turning angle will be 39 degrees to the right and 45 degrees to the left.

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

STEERING CRAMP ANGLE CERTIFICATION

The fire apparatus manufacturer will provide, at time of bid, a letter from an independent third party testing agency stating they approve the steering cramp angle.

Highly specialized options may limit the cramp.

WHEELBASE

The wheelbase of the vehicle will be approximately 222.00"..

FRONT SUSPENSION

The front springs will be a Standens, three (3)-leaf, taper leaf design, 54.00" long x 4.00" wide, with a ground rating of 21,500 lb.

The two (2) top leaves will wrap the forward spring hanger pin. The top leaf will also wrap the rear spring hanger pin. Both the front and rear eyes will be Berlin style wraps that will place the eyes in the horizontal plane within the main leaf. This will reduce bending stress from acceleration and braking.

A steel encased rubber bushing will be used in the spring eye. The steel encased rubber bushing will be maintenance free and require no lubrication.

SHOCK ABSORBERS

To provide a smoother ride, the front axle will be furnished with heavy-duty (Monroe Magnum 65) telescoping shock absorbers.

GVW RATING

The gross vehicle weight rating will be 46,500#..

FRONT TIRES

Front tires will be Michelin 425/65R22.50 radials, 20 ply all-position XZY3 wide base tread.

The tires will be mounted on Alcoa 22.50" x 12.25" Dura-Bright® aluminum disc-type wheels with a ten (10) stud, 11.25" bolt circle.

REAR AXLE

The rear axle will be a Meritor™, Model RS-30-185, with a capacity of 31,000 lb.

TOP SPEED OF VEHICLE

A rear axle ratio will be furnished to allow the vehicle to reach a top speed of 65 MPH.

REAR SUSPENSION

The rear suspension will be a Reyco model 79KB with a ground rating of 31,000 lb. Spring hangers and mounting components will be cast. The suspension utilizes two (2) attaching points with variable rate spring cams and rubber bushed adjustable torque arms.

OIL SEALS

Oil seals with viewing window will be provided on the front axle.

REAR AXLE TWO (2) YEAR MATERIAL AND WORKMANSHIP WARRANTY

A Meritor axle limited warranty certificate, WA0046, is included with this proposal.

REAR TIRES

Rear tires will be four (4) Michelin 315/80R22.50 radials, 20 ply XDN2 Grip traction tread.

The outside tires will be mounted on Alcoa 22.50" x 9.00" polished aluminum, with Dura-Bright® finish, disc wheels with a ten (10) stud-11.25" bolt circle.

The inside tires will be mounted on 22.50" x 9.00" steel disc wheels with a ten (10) stud-11.25" bolt circle.

An isolator will be provided between the steel and aluminum rims.

HUB COVERS (front)

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

HUB COVERS (rear)

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

AUTOMATIC TIRE CHAINS

One (1) pair of Onspot automatic tire chains will be provided at the rear. System will be electric over air operated with switch on cab instrument panel. System may be engaged at speeds up to 25 mph and operated at speeds up to 35 mph.

COVERS, LUG NUT, CHROME

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

MUD FLAPS

Mud flaps will be installed behind the front and rear wheels.

BRAKES

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

The front brakes will be 16.50" x 6.00" cam operated with automatic slack adjusters.

OIL SEALS

Oil seals will be provided on the rear axle.

The rear brakes will be Meritor™ 16.50" x 8.63" cam operated with automatic slack adjusters.

AIR COMPRESSOR, BRAKE SYSTEM

The air compressor will be a Bendix BA-921 with 15.80 cubic feet per minute output at 1,250 RPM.

BRAKE SYSTEM

The brake system will include:

- Bendix-Westinghouse dual brake treadle valve with vinyl covered foot surface
- Heated automatic moisture ejector on air dryer
- Total air system capacity of 5,198 cubic inches
- Two (2) air pressure gauges with a red warning light and an audible alarm, that activates when air pressure falls below 60 psi
- MGM spring set parking brake system
- Parking brake operated by a Bendix-Westinghouse PP-1 control valve
- A parking "brake on" indicator light on instrument panel
- Bendix-Westinghouse SR-1 valve, in conjunction with a double check valve system, providing automatic spring brake application at 40 psi

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

To reduce the effects of corrosion, the air tank will be mounted with stainless steel brackets.

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

AIR INLET

A single air inlet with male coupling will be provided. It will allow station air to be supplied to the apparatus brake system through a shoreline hose. The inlet will be located in the driver side lower step well of cab. A check valve will be provided to prevent reverse flow of air. The inlet will discharge into the "wet" tank of the brake system. A mating female coupling will also be provided with the loose equipment.

ENGINE

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

Make: Detroit Diesel or Equivalent.

Model: DD13

Power: 500 hp at 1800 rpm

Torque: 1650 lb-ft at 1200 rpm

Governed Speed: 2080 rpm
Emissions Level: EPA 2010
Fuel: Diesel
Cylinders: Six (6)
Displacement: 781 cubic inches (12.8 L)
Starter: Delco 39MT
Fuel Filters: Dual cartridge style with check valve, water separator, and water in fuel sensor
Coolant Filter: Cartridge style with shut off valves on the supply and return line.

ENGINE BRAKE

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

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

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

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

CLUTCH FAN

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

ENGINE AIR INTAKE

An air intake with an ember separator (to prevent road dirt, burning embers, and recirculating hot air from entering the engine) will be mounted at the front of the apparatus, on the passenger side of the engine. The ember separator will be mounted in the air intake with flame retardant, roto-molded polyethylene housing. It will be easily accessible by the hinged access panel at the front of the vehicle.

EXHAUST SYSTEM

The exhaust system will include a diesel particulate filter (DPF) and a selective catalytic reduction (SCR) device to meet current EPA standards. The exhaust system will be stainless steel from the turbo to the inlet of the SCR device and will be 5.00" in diameter. An insulation wrap will be provided on all exhaust pipe between the turbo and SCR to minimize the transfer of heat to the cab. The exhaust will terminate horizontally ahead of the passenger side rear wheels. A tailpipe diffuser will be provided to reduce the temperature of the exhaust as it exits. Heat deflector shields will be provided to isolate chassis and body components from the heat of the tailpipe diffuser.

ANTI-LOCK BRAKE SYSTEM

The vehicle will be equipped with a Wabco 4S4M, anti-lock braking system. The ABS will provide a four (4) channel anti-lock braking control on both the front and rear wheels. A digitally controlled system that utilizes microprocessor technology will control the anti-lock braking system. Each wheel will be monitored by the system. When any particular wheel begins to lockup, a signal will be sent to the control unit. This control unit then will reduce

the braking of that wheel for a fraction of a second and then reapply the brake. This anti-lock brake system will eliminate the lockup of any wheel thus helping to prevent the apparatus from skidding out of control.

ANTI-LOCK BRAKE SYSTEM WARRANTY

The Wabco ABS system will come with a **three (3) year or 300,000 mile parts and labor** warranty provided by Meritor Wabco Vehicle Control Systems.

EXHAUST MODIFICATION

The exhaust pipe will be brought out from under the body at a 90 degree angle from the truck. The tail pipe will extend a minimum of 2.00" past the body, adaptable for the Plymovent system. The diameter of the pipe will be 7.00". There will be a clearance of 4.00" completely around the pipe once past the side of the body. A stop will be provided on the tail pipe that will prevent the nozzle from sliding too far on.

RADIATOR

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

For maximum corrosion resistance and cooling performance, the entire radiator core will be constructed using long life aluminum alloy. The core will be made of aluminum fins, having a serpentine design, brazed to aluminum tubes. The tubes will be brazed to aluminum headers. No solder joints or leaded material of any kind will be acceptable in the core assembly. The radiator core will have a minimum frontal area of 1434 square inches. Supply and return tanks made of glass-reinforced nylon will be crimped on to the core assembly using header tabs and a compression gasket to complete the radiator core assembly. The radiator will be compatible with commercial antifreeze solutions.

There will be a full steel frame around the entire radiator core assembly. The radiator core assembly will be isolated within the steel frame by rubber inserts to enhance cooling system durability and reliability. The radiator will be mounted in such a manner as to prevent the development of leaks caused by twisting or straining when the apparatus operates over uneven ground. The radiator assembly will be isolated from the chassis frame rails with rubber isolators.

The radiator assembly will include an integral deaeration tank permanently mounted to the top of the radiator framework, with a readily accessible remote-mounted overflow tank. For visual coolant level inspection, the radiator will have a built-in sight glass. The radiator will be equipped with a 15 psi pressure relief cap.

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

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

COOLANT LINES

Silicone hoses will be used for all engine/heater coolant lines installed by the chassis manufacturer.

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

DIESEL EXHAUST FLUID TANK

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

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

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

The tank will meet the engine manufacturers requirement for 10 percent expansion space in the event of tank freezing.

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

FUEL COOLER

An air to fuel cooler will be installed in the engine fuel return line.

TRANSMISSION

An Allison Gen IV, model EVS 4000P, electronic, torque converting, automatic transmission will be provided.

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

Two (2) PTO openings will be located on left side and top of converter housing (positions 8 o'clock and 1 o'clock).

A transmission temperature gauge with red light and buzzer will be installed on the cab instrument panel.

TRANSMISSION SHIFTER

A six (6)-speed push button shift module will be mounted to right of driver on console. Shift position indicator will be indirectly lit for after dark operation.

The transmission ratio will be 1st - 3.51 to 1.00, 2nd - 1.91 to 1.00, 3rd - 1.43 to 1.00, 4th - 1.00 to 1.00, 5th - 0.75 to 1.00, 6th - 0.64 to 1.00, R - 4.80 to 1.00.

TRANSMISSION COOLER

A shell and tube transmission oil cooler will be provided using engine coolant to control the transmission oil temperature. The cooler will have an aluminum shell and copper tubes. The cooler will be assembled using pressed in rubber tube sheets to mechanically create a reliable seal between the coolant and the oil. No brazed, soldered, or welded connections will be used to separate the coolant from the oil.

BRAKE LINES

Color-coded nylon brake lines will be provided. The lines will be wrapped in a heat protective loom in the chassis areas that are subject to excessive heat.

DRIVELINE

Drivelines will be a heavy-duty metal tube and be equipped with Spicer 1810 universal joints.

The shafts will be dynamically balanced before installation.

A splined slip joint will be provided in each driveshaft, slip joint will be coated with Glidecoat or equivalent.

STEERING

A Ross TAS-85 steering gear, with integral heavy-duty power steering, will be provided. For reduced system temperatures, the power steering will incorporate an air to oil cooler and a TRW model EV hydraulic pump with integral pressure and flow control. All power steering lines will have wire braded lines with crimped fittings.

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

STEERING ASSIST CYLINDER ON FRONT AXLE

To aid in the steering of the apparatus, the front axle will be equipped with a Ross power assist cylinder.

STEERING WHEEL

The steering wheel will be 18.00" in diameter, have tilting and telescoping capabilities, and a four (4)-spoke design.

LOGO AND CUSTOMER DESIGNATION ON DASH

The dash panel will have an emblem containing manufactures name and customer name. The emblem will have three (3) rows of text for the customer's department name. There will be a maximum of eight (8) characters in the first row, 11 characters in the second row and 11 characters in the third row.

The first row of text will be: TOWN OF VERNON

The second row of text will be: FIRE

The third row of text will be: DEPARTMENT

WHEEL CHOCKS

There will be two (2) pairs of folding Ziamatic SAC-44-E, aluminum alloy, Quick-Choc wheel blocks, with easy-grip handle provided.

WHEEL CHOCK BRACKETS

There will be two (2) pairs of Ziamatic SQCH-44-H horizontal mounting wheel chock brackets provided for the Ziamatic SAC-44-E folding wheel chocks. The brackets will be mounted in front of the rear axle on the DS and PS..

WINCH

A Warn, Model XD9000i multi-mount, 9,000 lb portable 12V electric winch will be provided.

The winch will mount to the vehicle receiver hitch and be held in place with a locking hardened pin. A heavy gauge wire and electrical plug will be provided for quick connection to the vehicle electrical system.

The winch will be provided with 125.00' of .313" galvanized cable with a replaceable clevis hook.

A minimum of a 30.00' remote control will be provided.

A label will be placed on or near the receiver that states the maximum winch load rating and the maximum rope load rating that the receiver can support.

BUMPER

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

The bumper will be extended 26.00" from front face of cab.

Documentation will be provided, upon request, to show that the options selected have been engineered for fit-up and approval for this modular bumper extension. A chart will be provided to indicate the option locations and will include, but not be limited to, the following options: air horns, mechanical sirens, speakers, hose trays (with hose capacities), winches, lights, discharge, and suction connections.

LIFT AND TOW MOUNTS

Mounted to the frame extension will be lift and tow mounts. The lift and tow mounts will be designed and positioned to adapt to certain tow truck lift systems.

The lift and tow mounts with eyes will be painted the same color as the frame.

TOW EYES

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

The inner and outer edges of the tow eyes will have a .25" radius.

The tow eyes will be painted black.

GRAVEL PAN

A gravel pan, constructed of bright aluminum tread plate, will be furnished between the bumper and cab face. The gravel pan will be properly supported from the underside to prevent flexing and vibration of the aluminum tread plate.

PORTABLE WINCH RECEIVER

A portable winch receiver will be centered under the front bumper extension of the apparatus.

The winch receiver will be constructed of heavy steel tubing and reinforced to the bumper extension framework for the receiving portion. The winch receiver will be a class IV receiver.

Winch power will be provided at location.

SIGHT RODS

Two (2) Bores, Model BG48-10, lighted sight rods will be mounted to the outside corners of the front bumper extension. The rods will be polished stainless steel.

CAB

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

The cab will be constructed of 5052-H32 aluminum skins on extruded aluminum framing. For increased structural integrity and occupant protection, the cab structure will include, directly forward of the driver and passenger areas, a .25" firewall plate and .50" lateral support plate that will tie the forward corner posts to the engine tunnel. The cab roof

will include a heavy one-piece aluminum extrusion with wall thickness up to .12", and will extend from side to side, and attach to the upper forward corner posts by customized aluminum castings. The sub-structure will include a .38" wall extrusion under the crew cab floor for support while tilting the cab. To provide quality at the source and single source customer support, the cab will be built by the apparatus manufacturer in a facility located on the manufacturer's premises.

The cab will be a full-tilt style to 80 degrees to accommodate engine maintenance and removal. The cab pivots will be located 46.00" apart to provide stability while tilting the cab. The cab will be tilted by an electric over hydraulic pump that is connected to two (2) cab lift cylinders 2.25" in diameter. The cab will be locked down by a two-point automatic locking mechanism actuated after the cab has been lowered. A three-point cab mount system with rubber isolators will improve ride quality by isolating chassis vibrations from the cab.

The crew cab will be a totally enclosed design with the interior area completely open to improve visibility and verbal communication between the occupants.

The forward cab section will have an overall height (from the cab roof to the ground) of approximately 102.00". The crew cab section will have a 20.00" raised roof, with an overall cab height of approximately 122.00". The overall height listed will be calculated based on a truck configuration with the lowest suspension weight ratings, the smallest diameter tires for the suspension, no water weight, no loose equipment weight, and no personnel weight. Larger tires, wheels, and suspension will increase the overall height listed.

The cab will have an interior width of not less than 93.50". The driver and passenger seating positions will have a minimum 24.00" clear width at knee level.

To reduce injuries to occupants in the seated positions, proper head clearance will be provided. The floor-to-ceiling height inside the forward cab will be no less than 60.25". The floor-to-ceiling height inside the crew cab will be no less than 72.95" in the center position and 78.75" in the outboard positions.

The crew cab will measure a minimum of 47.50" from the rear wall to the backside of the engine tunnel (knee level) for optimal occupant legroom.

INTERIOR CAB INSULATION

The cab walls, ceiling and engine tunnel will be insulated in all strategic locations to maximize acoustic absorption and thermal insulation. The cab will be insulated with 2.00" insulation in the rear wall, 3.00" insulation in the side walls, and 1.50" insulation in the ceiling.

ENGINE TUNNEL

To provide structural strength, the engine tunnel sidewalls will be constructed of .50" aluminum plate that is welded to both the .25" firewall and .38" heavy wall extrusion under the crew cab floor. To maximize occupant space, the top edges will be tapered.

The engine tunnel will be insulated on both sides for thermal and acoustic absorption. The underside of the tunnel will be covered with 1.00" thick polyether foam that is reinforced with an aluminized face. Thermal rating for this insulation will be -40 degrees Fahrenheit to 300 degrees Fahrenheit. The insulation will keep noise (dB) levels at or lower than the specifications in the current edition of the NFPA 1901 standards.

FENDER LINERS

Full-circular, aluminum, inner fender liners in the wheel wells will be provided.

REAR WALL COVERING

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

PANORAMIC WINDSHIELD

A one-piece, safety glass windshield with more than 2,802 square inches of clear viewing area will be provided. The windshield will be full width and will provide the occupants with a panoramic view. The windshield will consist of three (3) layers; the outer light, the middle safety laminate, and the inner light. The .114" thick outer light layer will provide superior chip resistance. The middle safety laminate layer will prevent the windshield glass pieces from detaching in the event of breakage. The inner light will provide yet another chip resistant layer. The cab windshield will be bonded to the aluminum windshield frame using a urethane adhesive. A custom frit pattern will be applied on the outside perimeter of the windshield for a finished automotive appearance.

SUNVISORS

Two (2) smoked Lexan sun visors 7.75" x 28.12" long will be provided. The sun visors will be located above the windshield with one (1) mounted on each side of the cab.

WINDSHIELD WIPERS

Three (3) electric windshield wipers with a washer, in conformance with FMVSS and SAE requirements, will be provided. The wiper blades will be 21.65" long and together will clear a minimum of 1,783 square inches of the windshield for maximum visibility in inclement weather.

The windshield washer fluid reservoir will be located at the front of the vehicle and be accessible through the access hood for simple maintenance.

FAST SERVICE ACCESS FRONT TILT HOOD

A full-width access hood will be provided for convenient access to engine coolant, steering fluid, wiper fluid, cab lift controls, headlight power modules, and ember separator. The hood will also provide complete access to the windshield wiper motor and components. The hood will be contoured to provide a sleek, automotive appearance. The hood will be constructed of two (2) fiberglass panels bonded together and will include reinforcing ribs for structural integrity. The hood will include air cylinders to hold the hood in open and closed positions, and a heavy duty latch system that will meet FMVSS 113 (Hood Latch System). The spring-loaded hood latch will be located at the center of the hood with a double-action release lever located behind the "Pierce" logo. The two-step release requires the lever first be pulled to the driver side until the hood releases from the first latch (primary latch) then to the passenger side to fully release the hood (secondary latch).

CAB LIFT

A hydraulic cab lift system will be provided, consisting of an electric-powered hydraulic pump, fluid reservoir, dual lift cylinders, remote cab lift controls and all necessary hoses and valves.

The cab lift controls will be located at the driver side front of the cab, easily accessible under the full width front access hood. The controls will include a permanently mounted raise/lower switch. For enhanced visibility during cab tilt operations, a remote control tether with on/off switch will be supplied on a coiled cord that will extend from 2.00' (coiled) to 6.00' (extended).

The rear of the cab will be locked down by a two (2)-point, automatic, hydraulic, double hook mechanism that fully engages after the cab has been lowered (self-locking). The dual 2.25" diameter hydraulic cylinders will be equipped with a velocity fuse that protects the cab from accidentally descending when the cab is in the tilt position.

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

INTERLOCK, CAB LIFT TO PARKING BRAKE

The cab lift safety system will be interlocked to the parking brake. The cab tilt mechanism will be active only when the parking brake is set and the ignition switch is in the on position. If the parking brake is released, the cab tilt mechanism will be disabled.

HIGH IDLE

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

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

GRILLE

A bright finished aluminum mesh grille screen, inserted behind a formed bright finished grille surround, will be provided on the front center of the cab, and will serve as an air intake to the radiator.

TRIM BAND (cab face)

A 10.00" band of 22 gauge polished stainless steel trim will be installed across the front of the cab, from door hinge to door hinge. The trim band will be centered on the head lights and applied with two-sided tape. A .625" self adhesive trim strip will be applied around the perimeter of the trim band.

MIRRORS

A Moto Mirror-Plus polished mirror, 7.62" x 13.50" flat glass and a 6.62" x 6.25" convex glass, will be mounted on each side of the front cab doors. Driver and passenger side mirrors will be heated and adjustable with remote control convenient to the driver.

ENGINE HOOD COVER

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

DOORS

The forward cab and crew cab doors will be the half-height style door. To enhance entry and egress to the cab, the forward cab doors will be a minimum of 43.59" wide x 64.71" high. The crew cab doors will measure a minimum of 37.87" wide x 73.75" high.

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

Each forward cab and crew cab entry door will contain a roll-down tempered glass window. The forward cab door windows will include a 7.50" high x 10.00" wide drop area at the front to enhance visibility.

A customized, vertical, pull-down type door handle will be provided on the exterior of each cab door. The exterior handle will be designed specifically for the fire service to prevent accidental activation, and will provide 4.00" wide x 2.00" deep hand clearance for ease of use with heavy gloved hands. Each door will also be provided with an interior flush, open style paddle handle that will be readily operable from fore and aft positions, and be designed to prevent accidental activation. The interior handles will provide 4.00" wide x 1.25" deep hand clearance for ease of use with heavy gloved hands.

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

A full length, heavy duty, stainless steel, piano-type hinge with a .38" pin and 11 gauge leaf will be provided on all cab doors. There will be double automotive-type rubber seals around the perimeter of the door framing and door edges to ensure a weather-tight fit.

The inner cab door panels will be constructed of painted aluminum and be removable without requiring the disconnection of door and window mechanisms. A dark grey vacuum formed ABS panel will house the window switches and will mold into the upper sill of the door panel.

The cab steps at each cab door location will be located below the cab doors and will be exposed to the exterior of the cab.

CAB DOOR SCUFFPLATES

Cab door scuff plates are not required due to stainless steel door panels on cab doors.

FUEL TANK

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

A .75" drain plug will be located in a low point of the tank for drainage.

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

A .50" diameter vent will be installed from tank top to just below fuel fill inlet.

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

ELECTRIC WINDOW CONTROLS

Each cab entry door will be equipped with an electrically operated window. A window control panel will be ergonomically molded into the armrest of the door panel within easy reach of the respective occupant. Each switch will allow intermittent or auto down operation for ease of use. Auto down operation will be actuated by holding the window down switch for approximately 1/2 second. The driver control panel will contain a control switch for each

cab door's window. All other door control panels will contain a single switch to operate the window within that door.

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

STEP LIGHTS

For reduced overall maintenance costs compared to incandescent lighting, there will be four (4) Ritar, Model M27HW2, LED, step lights provided. The lights will be installed at each cab and crew cab door, one (1) per step, in the driver side front doorstep, driver side crew cab doorstep, passenger side front doorstep and passenger side crew cab doorstep.

The lights will be activated when the adjacent door is opened.

FENDER CROWNS

Stainless steel fender crowns will be installed at the cab wheel openings.

TRANSMISSION WARRANTY

The transmission will have a **five (5) year/unlimited mileage** warranty covering 100 percent parts and labor. The warranty will be provided by Allison Transmission.

Note: The transmission cooler is not covered under any extended warranty you may be getting on your Allison Transmission. Please review your Allison Transmission warranty for coverage limitations.

UPPER REAR WINDOWS ON SIDES OF CREW CAB

Two (2) windows will be provided above the crew cab door, along the sides of the raised roof section of the cab, one (1) on each side of the cab. The profile of the glass will match the painted metal side sheet opening, creating a uniform threshold appearance. The windows will be bonded to the vehicle using urethane adhesive. The visibility through each window will measure 35.25" wide x 7.12" high.

CAB INTERIOR

With safety as the primary objective, the wrap-around style, high impact ABS polymer cab instrument panel will be designed with unobstructed visibility to instrumentation. The dash layout will provide the driver with a quick reference to gauges that allows more time to focus on the road. The center console will be a high impact ABS polymer, and will be easily removable for access to the defroster. The center console will include louvers strategically located for optimal air flow and defrost capability to the windshield. The passenger side dashboard will be constructed of painted aluminum for durability and low maintenance. For enhanced versatility, the passenger side dash will include a flat working surface. To provide optional (service friendly) control panels, switches and storage modules, a three (3) piece, 4mm thick polyethylene roto-molded overhead console will also be provided. To complete the cab front interior design, painted aluminum modesty panels will be provided under the dash on both sides of the cab. The driver side modesty panel will provide mounting for the battery switch and diagnostic connectors, while the passenger side modesty panel provides a glove box, and ground access to the main electrical distribution panel via quick quarter turn fasteners.

To provide a deluxe automotive interior, the engine tunnel will be covered by a leather grain vinyl that is resistant to oil, grease, and mildew. For durability and ease of maintenance, the cab interior side walls and rear wall will be painted gray, vinyl texture paint aluminum.

The inner cab door panels will include grab handles and control panels molded into the upper section of the door panel. The door panels will extend 36.50" down from the door window.

The headliner will be installed in both forward and rear cab sections. The crew cab headliner will be one piece. The headliner panel will be a composition of a corrugated high density polyethylene panel covered with a sound barrier and upholstery. For quick, easy access of electrical wiring, or to perform other maintenance needs without stripping screws, the headliner will be held in place by a dual lock fastening system that will require no tools for installation or removal.

The cab structure will include designated raceways for electrical harness routing from the front of the cab to the rear upper portion of the cab. Raceways will be extruded in the forward door frame, floor, walls and overhead in the area where the walls meet the ceiling. The raceways located in the floor will be covered by aluminum extrusion, while the vertical and overhead raceways will be covered by a decorative composite panel. The raceways will improve harness integrity by providing a continuous harness path that eliminates wire chafing and abrasion associated with exposed wiring or routing through drilled metal holes. Harnesses will be laid in place, not pulled through holes drilled in aluminum tubing. Once laid in place, all harnesses will be held in position by a hook and loop fastening system. The hook and loop system will allow for bracket fastener points to not puncture harnesses. The raceways will include removable covers, providing maintenance personnel with quick and easy access for trouble shooting, or the addition of accessories. Harnesses will be located within the raceway behind the wire way cover.

CAB INTERIOR UPHOLSTERY

The cab interior upholstery will be dark silver gray. All cab interior materials will meet FMVSS 302 (flammability of interior materials).

INTERIOR PAINT (Cab)

A rich looking interior will be provided by painting all the metal surfaces inside the cab gray, vinyl texture paint.

CAB FLOOR

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

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

CAB DEFROSTER

To provide maximum defrost and heating performance, a 54,961BTU heater-defroster unit with 558 SCFM of air flow will be provided inside the cab. The defroster unit will be strategically located under the center forward portion of the roto-molded instrument panel. For easy access, a removable roto-molded cover will be installed over the defroster unit. The defroster will include an integral aluminum frame air filter, high performance dual scroll blowers, and ducts designed to provide maximum defrosting capabilities for the one (1) piece windshield. The defroster ventilation will be built into the design of the cab dash instrument panel and will be easily removable for maintenance. The defroster will be capable of clearing 98 percent of the windshield and side glass when tested under conditions where the cab has been cold soaked at zero (0) degrees Fahrenheit for ten (10) hours, and a two (2) ounce per square inch layer of frost/ice has been able to build up on the exterior windshield. The defroster system will meet or exceed SAE J382 (minimum defrosting system performance requirements).

CAB/CREW CAB HEATER

Two (2) 36,702 BTU auxiliary heaters with 276 SCFM each unit of air flow will be provided inside the crew cab, one (1) in each outboard rear-facing seat riser. The heaters will include high performance dual scroll blowers one (1) for each unit. Outlets for the heaters will be located below each rear-facing seat riser and below the fronts of the driver and passenger seats, for efficient airflow. An extruded aluminum plenum will be incorporated in the cab structure that will transfer heat to the forward cab seating positions.

The heater-defroster and crew cab heaters will be controlled by a single integral electronic control panel. The heater control panel will allow the driver to control heat flow to the front and rear simultaneously. The control panel will include variable adjustment for temperature and fan control, and be conveniently located on the dash in clear view of the driver. The control panel will include highly visible, progressive LED indicators for both fan speed and temperature. For increased convenience, an optional dual control for the passenger position will also be available.

AIR CONDITIONING

A high-performance, customized air conditioning system will be furnished inside the cab and crew cab. A 19.10 cubic inch compressor will be installed on the engine.

The air conditioning system will be capable of cooling the average cab temperature from 100 degrees Fahrenheit to 64 degrees Fahrenheit in the forward section of the cab, and 69 degrees Fahrenheit in the rear section of the cab, at 50 percent relative humidity within 30 minutes. The cooling performance test will be run only after the cab has been heat soaked at 100 degrees Fahrenheit for a minimum of 4 hours.

A roof-mounted condenser with a 63,000 BTU output that meets and exceeds the performance specification will be installed on the cab roof.

The evaporator unit will be installed in the cab, located in the center of the cab ceiling over the engine tunnel. The evaporator will include two (2) high performance cores and plenums with multiple outlets, one plenum directed to the front and one plenum directed to the rear of the cab.

The evaporator unit will have a 49,000 BTU rating that meets and exceeds the performance specifications. Adjustable air outlets will be strategically located on the evaporator cover per the following:

Two (2) will be directed towards the drivers location

Two (2) will be directed towards the officers location

Six (6) will be directed towards crew cab area

The air conditioner refrigerant will be R-134A and will be installed by a certified technician.

The air conditioner will be controlled by a single integral electronic control panel for the heater, defroster and air conditioner. For ease of operation, the control panel will include variable adjustment for temperature and fan control, and be conveniently located on the dash in clear view of the driver. The control panel will include highly visible, progressive LED indicators for both fan speed and temperature. For added convenience, an optional dual control for the passenger position will also be available.

INTERIOR CAB INSULATION

The cab walls, ceiling and engine tunnel will be insulated in all strategic locations to maximize acoustic absorption and thermal insulation. The cab will be insulated with 2.00" insulation in the rear wall, 3.00" insulation in the side walls, and 1.50" insulation in the ceiling. Headliners will be constructed from a .20" high density polyethylene corrugated material. Each headliner will be wrapped with a 0.25" thick foil faced poly damp low emissivity foam insulation barrier for acoustic and thermal control. For ease of installation and removal, all headliners will be held in place by a dual lock fastening system. Headliner installation requiring removal of mechanical fasteners will not be acceptable.

Designed for maximum sound absorption and thermal insulation, the rear cab wall will be insulated with a 1.50" thick open cell acoustical foam. The thermal protection of the foam will provide an R-value of four (4) per 1.00" thickness.

TIRE BALANCE

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

GRAB HANDLE

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

A long rubber grab handle will be mounted on the dash board in front of the officer.

ACCESS TO ENGINE DIPSTICKS

For access to the engine oil and transmission fluid dipsticks, there will be a door on the engine tunnel, inside the crew cab. The door will be on the rear wall of the engine tunnel, on the vertical surface. The door will be 17.75" wide x 12.75" high and be flush with the wall of the engine tunnel.

The engine oil dipstick will allow for checking only. The transmission dipstick will allow for both checking and filling. An additional tube will be provided for filling the engine oil.

The door will have a rubber seal for thermal and acoustic insulation. One (1) flush latch will be provided on the access door.

TIRE PRESSURE MANAGEMENT

There will be a VECSAFE LED tire alert pressure management system provided that will monitor each tire's pressure. A chrome plated brass sensor will be provided on the valve stem of each tire for a total of six (6) tires.

The sensor will calibrate to the tire pressure when installed on the valve stem for pressures between 20 and 120 psi. The sensor will activate an integral battery operated LED when the pressure of that tire drops eight (8) psi.

Removing the cap from the sensor will indicate the functionality of the sensor and battery. If the sensor and battery are in working condition, the LED will immediately start blinking.

FRONTAL IMPACT PROTECTION

The cab will be provided with a frontal impact protection system and will include the following:

- A supplemental restraint system (SRS) sensor will be installed on a structural cab member behind the instrument panel. The SRS sensor will perform real time diagnostics of all critical subsystems and will record sensory inputs immediately before and during a frontal impact event.
- A fault-indicating light will be provided on the vehicle's instrument panel allowing the driver to monitor the operational status of the SRS system.
- A driver side front air bag will be mounted in the steering wheel and will be designed to protect the head and upper torso of the occupant, when used in combination with the three (3)-point seat belt.
- A passenger side knee bolster air bag will be mounted in the modesty panel below the dash panel and will be designed to protect the legs of the occupant, when used in combination with the three (3)-point seat belt.
- Driver and front passenger suspension seats will be provided with devices to retract them to the lowest travel position during a frontal impact event.
- Driver and front passenger seat belts will be provided with pre-tensioners to remove slack from the seat belt during frontal impact event.

The SRS system will provide protection during a frontal or oblique impact event. The system will activate when the vehicle decelerates at a predetermined G force known to cause injury to the occupants. The cab and chassis will have been subjected, via third party test facility, to a crash impact during frontal and oblique impact testing. Testing included all major chassis and cab components such as mounting straps for fuel and air tanks, suspension mounts, front suspension components, rear suspensions components, frame rail cross members, engine and transmission and their mounts, pump house and mounts, frame extensions and body mounts. The testing provided configuration specific information used to optimize the timing for firing the safety restraint system. The sensor will activate the pyrotechnic devices when the correct crash algorithm, wave form, is detected.

The SRS system will deploy the following components in the event of a frontal or oblique impact event:

- Driver side front air bag.
- Passenger side knee bolster air bag.
- Driver and front passenger suspension seats will be retracted to the lowest travel position.
- Driver and front passenger seat belts will be pre-tensioned to firmly hold the occupant in place.

DRIVER SEAT

A Seats Inc. #911 or equivalent high back style air suspension seat will be provided in the cab for the driver.

The seat will include the following features incorporated into the frontal impact protection system.

A suspension seat safety system will be included. When activated, this system will pretension the seat belt and retract the seat to its lowest travel position.

The seat will be furnished with a three (3)-point, shoulder type seat belt. The seat belt will be furnished with automatic retractor. Extension will be provided with the seat belt so the male

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

OFFICER SEAT

A Seats Inc. 911 or equivalent air suspension seat will be provided in the cab for the passenger.

The seat back will be an SCBA back style. The SCBA cavity will be adjustable from front to rear in 1.00" increments to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seat will include the following features incorporated into the frontal impact protection system.

A suspension seat safety system will be included. When activated, this system will pretension the seat belt and retract the seat to its lowest travel position.

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

RADIO COMPARTMENT

A compartment for the radio amplifier will be located on the floor of the cab behind the front passenger's seat. A lift-up door with a chrome plated lift and turn latch will be provided for access. The compartment will be constructed of smooth aluminum and painted to match the cab interior. The radio control will be located in the overhead console on the passenger's side.

REAR FACING DRIVER SIDE OUTBOARD SEAT

There will be one (1) Seats Incorporated 911 or equivalent rear facing seat provided at the driver side outboard position in the crew cab.

The seat back will be an SCBA back style. The SCBA cavity will be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

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

REAR FACING PASSENGER SIDE OUTBOARD SEAT

There will be one (1) Seats Inc. 911 or equivalent rear facing seat provided at the passenger side outboard position in the crew cab.

The seat back will be an SCBA back style. The SCBA cavity will be adjustable from front to rear in 1.00" increments to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

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

FORWARD FACING DRIVER SIDE OUTBOARD SEAT

There will be one (1) forward facing flip-up seat provided at the driver side outboard position in the crew cab. The seat back will have an aluminum backing, covered with foam padded upholstery. The seat bottom will be constructed of a piece of plywood covered with foam rubber and upholstery. The bottom cushion will have its bottom covered with brushed stainless steel, for a pleasant appearance when the seat bottom is in the up position. To ensure safe operation, the seat will be equipped with seat belt sensors in the seat cushion and belt receptacle, that will activate an alarm indicating a seat is occupied but not buckled.

The seat will be furnished with a three-point, shoulder type seat belt. To provide quick, easy use for occupants wearing bunker gear, the seat belt will have a minimum 120.00" shoulder length and 55.00" lap length. The seat belt tongue will be stored at waist position for quick application by the seat occupant. The seat belt receptacle will be provided on a cable conveniently nested next to the seat cushion, providing easy accessibility. The seat belt will be furnished with dual automatic retractors that will provide ease of operation in the normal seating position.

FORWARD FACING CENTER SEATS

There will be two (2) Seats Inc. #911 or equivalent forward facing seats provided at the center position in the crew cab.

The seat backs will be an SCBA back style. The SCBA cavity will be adjustable from front to rear in 1.00" increments, to accommodate different sized SCBA cylinders. Moving the SCBA cavity will be accomplished by unbolting, relocating, and re-bolting it in the desired location.

The seats will be furnished with a three (3)-point, shoulder type seat belt. The seat belt will be furnished with automatic retractors. Extension will be provided with the seat belt so the male end can be easily grasped and the female end easily located while sitting in a normal position.

EMS COMPARTMENT

An EMS compartment, 21.00" wide x 64.00" high x 14.00" deep with one (1) Gortite roll up door, locking, with white finish will be provided in the crew cab.

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

COMPARTMENT LIGHT

There will be one (1) On Scene Solutions strip light installed on the left side of the compartment opening. The lights will be controlled by an automatic door switch.

SEAT UPHOLSTERY

All Seats Inc. 911 seat upholstery will be gray woven with black Imperial 1200 material.

AIR BOTTLE HOLDERS

All SCBA type seats in the cab will have a "Hands-Free" auto clamp style bracket in its backrest. For efficiency and convenience, the bracket will include an automatic spring clamp that allows the occupant to store the SCBA bottle by simply pushing it into the seat back. For protection of all occupants in the cab, in the event of an accident, the inertial components within the clamp will constrain the SCBA bottle in the seat and will exceed the NFPA standard of 9G. Bracket designs with manual restraints (belts, straps, buckles) that

could be inadvertently left unlocked and allow the SCBA to move freely within the cab during an accident, will not be acceptable.

There will be a quantity of three (3) SCBA brackets.

SHOULDER HARNESS HEIGHT ADJUSTMENT

All seating positions furnished with three (3)-point shoulder type seat belts will include a height adjustment. This adjustment will optimize the belts effectiveness and comfort for the seated firefighter.

A total of four (6) seating positions will have the adjustable shoulder harness.

CAB DOME LIGHTS

There will be two (2) Weldon Model 8081, incandescent dome lights installed in the cab providing an overall lower cost of ownership. The lights will be mounted above the inside shoulder of the driver and officer. The forward, clear, light will be controlled by the door switch and the lens switch. The rear, red, light will be controlled by the lens switch only.

In addition, there will be two (2) adjustable map lights with an integral switch recessed into the cab ceiling. One (1) light will be located above the driver's seat and one (1) light will be located above the officer's seat.

CREW CAB DOME LIGHTS

There will be two (2) Weldon Model 8081, incandescent dome lights installed in the crew cab. The forward, clear light will be controlled by the door switch and the lens switch. The rear, red light will be controlled by the lens switch only.

CAB INSTRUMENTATION

The cab instrument panel will consist of gauges, an LCD display, telltale indicator lights, alarms, control switches, and a diagnostic panel. The function of instrument panel controls and switches will be identified by a label adjacent to each item. Actuation of the headlight switch will illuminate the labels in low light conditions. Telltale indicator lamps will not be illuminated unless necessary. The cab instruments and controls will be conveniently located within the forward cab section directly forward of the driver. Gauge and switch panels will be designed to be removable for ease of service and low cost of ownership.

GAUGES

The gauge panel will include the following ten (10) ivory gauges with chrome bezels to monitor vehicle performance:

- Voltmeter gauge (Volts)

Low volts (11.8 VDC)

Amber indicator on gauge assembly with alarm

High volts (15 VDC)

Amber indicator on gauge assembly with alarm

Very low volts (11.3 VDC)

Amber indicator on gauge assembly with alarm

Very high volts (16 VDC)

Amber indicator on gauge assembly with alarm

- Tachometer (RPM)

- Speedometer (Primary (outside) MPH, Secondary (inside) Km/H)

- Fuel level gauge (Empty - Full in fractions)

Low fuel (1/8 full)

Amber indicator on gauge assembly with alarm

Very low fuel (1/32) fuel

Amber indicator on gauge assembly with alarm

- Engine oil pressure gauge (PSI)

Low oil pressure to activate engine warning lights and alarms

Red indicator on gauge assembly with alarm

- Front air pressure gauge (PSI)

Low air pressure to activate warning lights and alarm

Red indicator on gauge assembly with alarm

- Rear air pressure gauge (PSI)

Low air pressure to activate warning lights and alarm

Red indicator on gauge assembly with alarm

- Transmission oil temperature gauge (Fahrenheit)

High transmission oil temperature activates warning lights and alarm

Amber indicator on gauge assembly with alarm

- Engine coolant temperature gauge (Fahrenheit)

High engine temperature activates an engine warning light and alarm

Red indicator on gauge assembly with alarm

- Diesel Exhaust Fluid Level Gauge (Empty - Full in fractions)

Low fluid (1/8 full)

Amber indicator on gauge assembly with alarm

All gauges and gauge indicators will perform prove out at initial power-up to ensure proper performance.

INDICATOR LAMPS

To promote safety, the following telltale indicator lamps will be integral to the gauge assembly and are located above and below the center gauges. The indicator lamps will be "dead-front" design that is only visible when active. The colored indicator lights will have descriptive text or symbols.

The following amber telltale lamps will be present:

- Low coolant
- Trac cntl (traction control) (where applicable)
- Check engine
- Check trans (check transmission)
- Aux brake overheat (Auxiliary brake overheat)
- Air rest (air restriction)
- Caution (triangle symbol)
- Water in fuel
- DPF (engine diesel particulate filter regeneration)
- Trailer ABS (where applicable)
- Wait to start (where applicable)
- HET (engine high exhaust temperature) (where applicable)
- ABS (antilock brake system)
- MIL (engine emissions system malfunction indicator lamp) (where applicable)
- SRS (supplemental restraint system) fault (where applicable)
- DEF (low diesel exhaust fluid level)

The following red telltale lamps will be present:

- Warning (stop sign symbol)
- Seat belt
- Parking brake
- Stop engine
- Rack down

The following green telltale lamps will be provided:

- Left turn
- Right turn
- Battery on

The following blue telltale lamp will be provided:

- High beam

ALARMS

Audible steady tone warning alarm: A steady audible tone alarm will be provided whenever a warning message is present.

Audible pulsing tone caution alarm: A pulsing audible tone alarm (chime/chirp) will be provided whenever a caution message is present without a warning message being present.

Alarm silence: Any active audible alarm will be able to be silenced by holding the ignition switch at the top position for three (3) to five (5) seconds. For improved safety, silenced audible alarms will intermittently chirp every 30 seconds until the alarm condition no longer exists. The intermittent chirp will act as a reminder to the operator that a caution or warning condition still exists. Any new warning or caution condition will enable the steady or pulsing tones respectively.

INDICATOR LAMP AND ALARM PROVE-OUT

Telltale indicators and alarms will perform prove-out at initial power-up to ensure proper performance.

CONTROL SWITCHES

For ease of use, the following controls will be provided immediately adjacent to the cab instrument panel within easy reach of the driver.

Emergency master switch: A molded plastic push button switch with integral indicator lamp will be provided. Pressing the switch will activate emergency response lights and siren control. A green lamp on the switch provides indication that the emergency master mode is active. Pressing the switch again disables the emergency master mode.

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

Panel backlighting intensity control switch: A three (3)-position momentary rocker switch will be provided. The first switch position decreases the panel backlighting intensity to a minimum level as the switch is held. The second switch position is the default position that does not affect the backlighting intensity. The third switch position increases the panel backlighting intensity to a maximum level as the switch is held.

The following standard controls will be integral to the gauge assembly and are located below the right hand gauges. All switches have backlit labels for low light applications.

High idle engagement switch: A two (2)-position momentary rocker switch with integral indicator lamp will be provided. The first switch position is the default switch position. The second switch position will activate and deactivate the high idle function when pressed and released. The "Ok To Engage High Idle" indicator lamp must be active for the high idle function to engage. A green indicator lamp integral to the high idle engagement switch will indicate when the high idle function is engaged.

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

The following standard controls will be provided adjacent to the cab gauge assembly within easy reach of the driver. All switches will have backlit labels for low light applications.

Ignition switch: A three (3)-position maintained/momentary rocker switch will be provided. The first switch position will deactivate vehicle ignition. The second switch position will activate vehicle ignition. The third momentary position will disable the Command Zone audible alarm if held for three (3) to five (5) seconds. A green indicator lamp will be activated with vehicle ignition.

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

4-way hazard switch: A two (2)-position maintained rocker switch will be provided. The first switch position will deactivate the 4-way hazard switch function. The second switch position will activate the 4-way hazard function. The switch actuator will be red and includes the international 4-way hazard symbol.

Heater, defroster, and optional air conditioning control panel: A control panel with membrane switches will be provided to control heater/defroster temperature and heater, defroster, and air conditioning fan speeds. A green LED status bar will indicate the relative temperature and fan speed settings.

Turn signal arm: A self-canceling turn signal with high beam headlight and windshield wiper/washer controls will be provided. The windshield wiper control will have high, low, and intermittent modes.

Parking brake control: An air actuated push/pull park brake control valve will be provided.

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

CUSTOM SWITCH PANELS

The design of cab instrumentation will allow for emergency lighting and other switches to be placed within easy reach of the operator thus improving safety. There will be positions for up to four (4) switch panels in the overhead console on the driver's side, up to four (4) switch panels in the engine tunnel console facing the driver, up to four (4) switch panels in the overhead console on the officer's side and up to two (2) switch panels in the engine tunnel console facing the officer. All switches will have backlit labels for low light applications.

DIAGNOSTIC PANEL

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

The diagnostic panel will include the following:

- Engine diagnostic port
- Transmission diagnostic port
- ABS diagnostic port
- SRS diagnostic port (where applicable)
- Command Zone USB diagnostic port
- Engine diagnostic switch (blink codes flashed on check engine telltale indicator)
- ABS diagnostic switch (blink codes flashed on ABS telltale indicator)
- Diesel particulate filter regeneration switch (where applicable)
- Diesel particulate filter regeneration inhibit switch (where applicable)

CAB LCD DISPLAY

A digital four (4)-row by 20-character dot matrix display will be integral to the gauge panel. The display will be capable of showing simple graphical images as well as text. The display will be split into three (3) sections. Each section will have a dedicated function. The upper left section will display the outside ambient temperature.

The upper right section will display, along with other configuration specific information:

- Odometer
- Trip mileage
- PTO hours
- Fuel consumption
- Engine hours

The bottom section will display INFO, CAUTION, and WARNING messages. Text messages will automatically activate to describe the cause of an audible caution or warning alarm. The LCD will be capable of displaying multiple text messages should more than one caution or warning condition exist.

AIR RESTRICTION INDICATOR

A high air restriction warning indicator light LCD message with amber warning indicator and audible alarm will be provided.

SWITCH PANELS

The emergency light switch panel will have a master switch for ease of use plus individual switches for selective control. Each switch panel will contain up to six (6) rocker-type switches each rated for two hundred thousand (200,000) cycles. Panels with less than six (6) switches will include indicators or blanks. The switch panel(s) will be located in the "overhead" position above the windshield on the driver side overhead to allow for easy access.

The switches will be rocker-type and include an integral indicator light. For quick, visual indication the switch will be illuminated whenever the switch is active. A 2-ply, scratch resistant laser engraved Gravoply label indicating the use of each switch will be placed below the switches. The label will allow light to pass through the letters for improved visibility in low light conditions. Switches and light source are integral to the switch panel assembly.

WIPER CONTROL

For simple operation and easy reach, the windshield wiper control will be an integral part of the directional light lever located on the steering column. The wiper control will include high and low wiper speed settings, a one (1)-speed intermittent wiper control and windshield washer switch. The control will have a "return to park" provision, which allows the wipers to return to the stored position when the wipers are not in use.

INFORMATION CENTER

A LCD display integral to the cab gauge panel will be included as outlined in the cab instrumentation area.

INTERCOM SYSTEM

A Setcom, model IM-900, intercom system will be provided. Intercom stations will be located at the driver, officer, and two (2) crew cab positions. The driver, and officer positions will be interfaced with the radio and have a "push to talk" (PTT) button located on the bottom of each headset. All other positions will have intercom only capability.

The following components will be supplied with this system:

- One (1) IM-900 intercom/radio mixer.
- One (1) CS-900R radio transmit/intercom headset, right cable dress (driver).
- One (1) CS-900L radio transmit/intercom headset, left cable dress (officer).
- One (1) CS-901R radio receive/intercom PTT headset (crew cab).
- One (1) CS-901L radio receive/intercom PTT headset (crew cab).
- One (1) JS-900 dual jump seat station.
- Four (4) Headset Hangar Hooks

RADIO INTERFACE CABLE

The body builder will supply and install the required radio interface cable before delivery of the vehicle. The radio equipment to be used by the customer will be Kenwood TK-690HBK. .

ELECTRICAL POWER CONTROL SYSTEM

The primary power distribution will be located forward of the officer's seating position and be easily accessible while standing on the ground for simplified maintenance and troubleshooting. Additional electrical distribution centers will be provided throughout the vehicle to house the vehicle's electrical power, circuit protection, and control components. The electrical distribution centers will be located strategically throughout the vehicle to minimize wire length. For ease of maintenance, all electrical distribution centers will be easily accessible. All distribution centers containing fuses, circuit breakers and/or relays will be easily accessible.

Distribution centers located throughout the vehicle will contain battery powered studs for supplying customer installed equipment thus providing a lower cost of ownership.

Circuit protection devices, which conform to SAE standards, will be utilized to protect electrical circuits. All circuit protection devices will be rated per NFPA requirements to prevent wire and component damage when subjected to extreme current overload. General protection circuit breakers will be Type-I automatic reset (continuously resetting). When required, automotive type fuses will be utilized to protect electronic equipment. Control relays and solenoid will have a direct current rating of 125 percent of the maximum current for which the circuit is protected per NFPA.

SOLID-STATE CONTROL SYSTEM

A solid-state electronics based control system will be utilized to achieve advanced operation and control of the vehicle components. A fully computerized vehicle network will consist of electronic modules located near their point of use to reduce harness lengths and improve reliability. The control system will comply with SAE J1939-11 recommended practices.

The control system will operate as a master-slave system whereas the main control module instructs all other system components. The system will contain patented Mission Critical

software that maintains critical vehicle operations in the unlikely event of a main controller error. The system will utilize a Real Time Operating System (RTOS) fully compliant with OSEK/VDX™ specifications providing a lower cost of ownership.

For increased reliability and simplified use the control system modules will include the following attributes:

Green LED indicator light for module power

Red LED indicator light for network communication stability status

Control system self test at activation and continually throughout vehicle operation

No moving parts due to transistor logic

Software logic control for NFPA mandated safety interlocks and indicators

Integrated electrical system load management without additional components

Integrated electrical load sequencing system without additional components

Customized control software to the vehicle's configuration

Factory and field reprogrammable to accommodate changes to the vehicle's operating parameters

Complete operating and troubleshooting manuals

USB connection to the main control module for advanced troubleshooting

To assure long life and operation in a broad range of environmental conditions, the solid-state control system modules will meet the following specifications:

Module circuit board will meet SAE J771 specifications

Operating temperature from -40C to +70C

Storage temperature from -40C to +70C

Vibration to 50g

IP67 rated enclosure (Totally protected against dust and also protected against the effect of temporary immersion between 15 centimeters and one (1) meter)

Operating voltage from eight (8) volts to 16 volts DC

The main controller will activate status indicators and audible alarms designed to provide warning of problems before they become critical.

CIRCUIT PROTECTION AND CONTROL DIAGRAM

Copies of all job-specific, computer network input and output (I/O) connections will be provided with each chassis. The sheets will indicate the function of each module connection point, circuit protection information (where applicable), wire numbers, wire colors and load management information.

ON-BOARD ELECTRICAL SYSTEM DIAGNOSTICS

Advanced on-board diagnostic messages will be provided to support rapid troubleshooting of the electrical power and control system. The diagnostic messages will be displayed on the information center located at the driver's position.

The on-board information center will include the following diagnostic information:

Text description of active warning or caution alarms

Simplified warning indicators

Amber caution light with intermittent alarm

Red warning light with steady tone alarm

ADVANCED DIAGNOSTICS

An advanced, Windows-based, diagnostic software program will be provided for this control system. The software will provide troubleshooting tools to service technicians equipped with an IBM compatible computer.

The service and maintenance software will be easy to understand and use and have the ability to view system input/output (I/O) information.

INDICATOR LIGHT AND ALARM PROVE-OUT SYSTEM

A system will be provided which automatically tests basic indicator lights and alarms located on the cab instrument panel.

VOLTAGE MONITOR SYSTEM

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

The alarm will activate if the system falls below 11.8 volts DC for more than two (2) minutes.

DEDICATED RADIO EQUIPMENT CONNECTION POINTS

There will be three (3) studs provided in the primary power distribution center located in front of the officer for two-way radio equipment.

The studs will consist of the following:

12-volt 40-amp battery switched power

12-volt 60-amp ignition switched power

12-volt 60-amp direct battery power

There will also be a 12-volt 100-amp ground stud located in or adjacent to the power distribution center.

ENHANCED SOFTWARE

The solid-state control system will include the following software enhancements:

All perimeter lights and scene lights (where applicable) will be deactivated when the parking brake is released.

Cab and crew cab dome lights will remain on for ten (10) seconds for improved visibility after the doors close. The dome lights will dim after ten (10) seconds or immediately if the vehicle is put into gear.

Cab and crew cab perimeter lights will remain on for ten (10) seconds for improved visibility after the doors close. The dome lights will dim after ten (10) seconds or immediately if the vehicle is put into gear.

EMI/RFI PROTECTION

To prevent erroneous signals from crosstalk contamination and interference, the electrical system will meet, at a minimum, SAE J551/2, thus reducing undesired electromagnetic and radio frequency emissions. An advanced electrical system will be used to ensure radiated and conducted electromagnetic interference (EMI) or radio frequency interference (RFI) emissions are suppressed at their source.

The apparatus will have the ability to operate in the electromagnetic environment typically found in fire ground operations to ensure clean operations. The electrical system will meet, without exceptions, electromagnetic susceptibility conforming to SAE J1113/25 Region 1, Class C EMR for 10Khz-1GHz to 100 Volts/Meter. The vehicle OEM, upon request, will provide EMC testing reports from testing conducted on an entire apparatus and will certify that the vehicle meets SAE J551/2 and SAE J1113/25 Region 1, Class C EMR for 10Khz-1GHz to 100 Volts/Meter requirements. Component and partial (incomplete) vehicle testing is not adequate as overall vehicle design can impact test results and thus is not acceptable by itself.

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

DOOR JAMB SCUFFPLATES

All cab door jambs will be furnished with a polished stainless steel scuff plate, mounted on the striker side of the jamb.

BATTERY COMPARTMENTS

The batteries will be stored in well-ventilated compartments that are located under the cab and bolted directly to the chassis frame. The battery compartments will be constructed of 3/16" steel plate and be designed to accommodate a maximum of three (3) group 31 batteries in each compartment. The compartments will include formed fit heavy-duty roto-molded polyethylene battery tray inserts with drains on each side of the frame rails. The batteries will be mounted inside of the roto-molded trays.

JUMPER STUDS

One (1) set of battery jumper studs with plastic color-coded covers will be installed on the battery box on the driver's side. This will allow enough room for easy jumper cable access.

BATTERY CHARGER/ AIR COMPRESSOR

A Kussmaul Pump Plus 1000, model 091-9-1000 single output battery charger/air compressor system with internal battery saver will be provided. A display bar graph indicating the state of charge will be included.

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

The 12-volt air compressor will be installed to maintain the air system pressure when the vehicle is not in use.

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

Battery charger/compressor will be located in the front left body compartment.

The battery charger indicator will be located behind the driver's door on the outside of the cab.

ELECTRIC POWER FOR WINCH

Electric power provisions will be furnished for the portable winch from the chassis battery system.

The receiver plug will be located in the Front, Rear, DS and PS of the body..

A total quantity of four (4) receptacles will be provided.

ALTERNATOR

A C.E. Niehoff, model C680-1, alternator will be provided. It will have a rated output current of 430 amp as measured by SAE method J56. It will also have a custom three (3)-set point voltage regulator, manufactured by C. E. Niehoff. The alternator will be connected to the power and ground distribution system with heavy-duty cables sized to carry the full rated alternator output.

ELECTRONIC LOAD MANAGER

An electronic load management (ELM) system will be provided that monitors the vehicles 12-volt electrical system, automatically reducing the electrical load in the event of a low voltage condition, and automatically restoring the shed electrical loads when a low voltage condition expires. This ensures the integrity of the electrical system.

For improved reliability and ease of use, the load manager system will be an integral part of the vehicle's solid state control system requiring no additional components to perform load management tasks. Load management systems which require additional components will not be allowed.

The system will include the following features:

- System voltage monitoring.

- A shed load will remain inactive for a minimum of five minutes to prevent the load from cycling on and off.

- Sixteen available electronic load shedding levels.

- Priority levels can be set for individual outputs.

- High Idle to activate before any electric loads are shed and deactivate with the service brake.

- If enabled:

 - “Load Man Hi-Idle On” will display on the information center.

 - Hi-Idle will not activate until 30 seconds after engine start up.

 - Individual switch "on" indicator to flash when the particular load has been shed.

 - The information center indicates system voltage.

The information center includes a "Load Manager" screen indicating the following:

- Load managed items list, with priority levels and item condition.

- Individual load managed item condition:

ON = not shed

SHED = shed

SEQUENCER

A sequencer will be provided that automatically activates and deactivates vehicle loads in a preset sequence thereby protecting the alternator from power surges. This sequencer operation will allow a gradual increase or decrease in alternator output, rather than loading or dumping the entire 12 volt load to prolong the life of the alternator.

For improved reliability and ease of use, the load sequencing system will be an integral part of the vehicle's solid state control system requiring no additional components to perform load sequencing tasks. Load sequencing systems which require additional components will not be allowed.

Emergency light sequencing will operate in conjunction with the emergency master light switch. When the emergency master switch is activated, the emergency lights will be activated one by one at half-second intervals. Sequenced emergency light switch indicators will flash while waiting for activation.

When the emergency master switch is deactivated, the sequencer will deactivate the warning light loads in the reverse order.

Sequencing of the following items will also occur, in conjunction with the ignition switch, at half-second intervals:

- Cab Heater and Air Conditioning
- Crew Cab Heater (if applicable)
- Crew Cab Air Conditioning (if applicable)
- Exhaust Fans (if applicable)
- Third Evaporator (if applicable)

EXTERIOR LIGHTING

Exterior lighting will comply with Federal Department of Transportation, Federal Motor Vehicle Safety Standards and National Fire Protection Association requirements in effect at time of proposal.

Front headlights will be rectangular shaped, quad style halogen lights mounted in the front trim housing. Headlights will consist of two (2) lights mounted in the front trim on each side of the cab grill. The outside light on each side will contain a low and high beam. The inside light on each side will contain a high beam light only.

The following LED lighting package will provide long life lights for a lower cost of ownership:

- One (1) Whelen 600 series LED combination directional/marker light will be located in the outside corners of the headlamp trim housing on each side.
- Three (3) Ri-Tar LED identification lamps will be installed in the center of the cab on the trim above the windshield.
- Four (4) Ri-Tar LED clearance lamp will be installed, one (1) each side, facing forward and one (1) each side, facing the side on the trim above the windshield.

EQUIPMENT TRAY

The front bumper extension will have an aluminum equipment tray recessed in the center. The tray will be recessed enough to hold two (2) hydraulic tools, with the ability to be preconnected to the reels. Mounting provisions for two (2) hydraulic reels will also be provided in the equipment tray, outside of the frame rails.

The make and model of the hydraulic tools will be Hurst..

EQUIPMENT TRAY COVER

A raised bright aluminum tread plate cover will be provided full width over the equipment tray and two (2) reels. Cover will be raised approximately 8.00".

The cover will be attached with a stainless steel hinge.

A stainless steel latch will secure the cover in the closed position and a pneumatic stay arm on each side will hold the cover in the open position.

STEP LIGHTS

Two (2) Ri-Tar, Model M27HW2 Super LED, step lights will be provided. The step lights will be provided at the rear body, one (1) each side of the tailboard.

The step lights will be controlled by a switch installed at the rear of the unit in an easily accessible area.

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

CD MANUAL, FIRE APPARATUS PARTS

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

The manual will contain the following:

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

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

SERVICE PARTS INTERNET SITE

The service parts information included in this manual is also available on the factory website. The website offers additional functions and features not contained in this manual, such as digital photographs and line drawings of select items. The website also features electronic search tools to assist in locating parts quickly.

CD MANUAL, CHASSIS SERVICE

A CD format chassis service manual containing parts and service information on major components will be provided with the completed unit.

The manual will contain the following sections:

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

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

CD MANUAL, CHASSIS OPERATION

A CD format chassis operation manual will be provided.

12 VOLT LIGHTING

There will be six (6) Whelen Model PCP2, 12 volt LED combination spotlight and floodlight(s) installed in semi-recessed housing(s) Model PBA203 located one [1] on each side of the cab as high as possible, and two [2] on each side of the body on the inside of the warning lights..

The light(s) selected above will be controlled by the following:

a switch at the driver's side switch panel

a switch at the passenger's side switch panel

no additional switch location

no additional switch location

These light(s) may be load managed when the parking brake is set

12 VOLT LIGHTING

There will be two (2) Whelen Model PFP1, 12 volt LED floodlight(s) installed in semi-recessed housing(s) Model PBA103 located on the upper rear of the Rescue Body, one [1] per side..

The light(s) selected above will be controlled by the following:

a switch at the driver's side switch panel

a switch at the passenger's side switch panel

no additional switch location

no additional switch location

These light(s) may be load managed when the parking brake is set

SEAT BELTS

All seating positions in the cab and crew cab will have red seat belts.

SEAT BELT MONITORING SYSTEM

A seat belt monitoring system (SBMS) will be provided. The SBMS will be capable of monitoring up to ten (10) seat positions indicating the status of each seat position with a green or red LED indicator as follows:

Driver Seat:

Seat Occupied Buckled Green

No Occupant Unbuckled Not Illuminated

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

All Other Seats:

Seat Occupied Buckled Green

Seat Occupied Unbuckled Red

No Occupant Buckled Red

No Occupant Unbuckled Not Illuminated

Alarm:

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

HELMET HOLDER

There will be eight (8) Zico UHH-1 helmet holder bracket(s) provided in the cab. The brackets will provide quick access and secure storage of the helmet(s). The bracket location(s) will be determined at time of final inspection at Pierce mfg.

TEN (10) YEAR STRUCTURAL INTEGRITY

A custom cab limited warranty certificate, WA0012, is included with this proposal.

ENGINE COMPARTMENT LIGHT

An engine compartment light will be installed under the engine hood, of which the switch is an integral part. Light will have a .125" diameter hole in its lens to prevent moisture retention.

RADIO WITH CD PLAYER

There will be a Panasonic AM/FM/Weatherband stereo radio with compact disc player and MP3 jack installed.

The compact disc stereo radio will be mounted in switch panel per layout.

The quantity and location of the speakers will be one (1) pair of 5.25" speakers located in the cab and one (1) pair of 5.25" speakers located in the crew cab.

The type and location of the antenna will be a roof-mounted rubber antenna located in an open space, on the cab roof.

VEHICLE DATA RECORDER

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

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

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

Vehicle Speed - MPH

Acceleration - MPH/sec

Deceleration - MPH/sec

Engine Speed - RPM

Engine Throttle Position - % of Full Throttle

ABS Event - On/Off

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

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

Master Optical Warning Device Switch - On/Off

Time - 24 Hour Time

Date - Year/Month/Day

BATTERY SYSTEM

Four (4) 12 volt, Exide Model 31S950X3W batteries that include the following features will be provided:

- 950 CCA, cold cranking amps

- 190 amp reserve capacity

- High cycle

- Group 31

- Rating of 3800 CCA at 0 degrees Fahrenheit

- 760 minutes of reserve capacity
- Threaded stainless steel studs

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

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

BATTERY SYSTEM

A single starting system will be provided.

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

MASTER BATTERY SWITCH

A master battery switch, to activate the battery system, will be provided inside the cab within easy reach of the driver.

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

AMP DRAW REPORT

The bidder will provide, at the time of bid and delivery, an itemized print out of the expected amp draw of the entire vehicle's electrical system.

The manufacturer of the apparatus will provide the following:

- 1) Documentation of the electrical system performance tests.
- 2) A written load analysis, which will include the following:
 - A) The nameplate rating of the alternator.
 - B) The alternator rating under the conditions specified per:
Applicable NFPA 1901 or 1906 (Current Edition).
 - C) The minimum continuous load of each component that is specified per:
Applicable NFPA 1901 or 1906 (Current Edition).
 - D) Additional loads that, when added to the minimum continuous load, determine the total connected load.
 - E) Each individual intermittent load.

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

BACK-UP ALARM

A PRECO, Model 1040, solid-state electronic audible back-up alarm that actuates when the truck is shifted into reverse will be provided. The device will sound at 60 pulses per minute and automatically adjust its volume to maintain a minimum ten (10) dBA above surrounding environmental noise levels.

ELECTRICAL WIRING DIAGRAMS

Two (2) electrical wiring diagrams, prepared for the model of chassis and body, will be provided.

HEAVY DUTY RESCUE BODY CONSTRUCTION

The rescue body will be of all aluminum construction. The body will use .125" and .188" 5052 aluminum. The structural support framing and the gussets used will be of 2.00" square .125" wall 6061 aluminum alloy tubing. All exterior body corners will be 3.00" radius aluminum, corrosion resistant alloy 6061 extrusions. Spacing of the 2.00" vertical supports will not exceed 14.00" on center. The roof and corner extrusions will be reinforced with interconnecting gusset supports at all stress points. The body will be properly welded into a unitized construction. Proper reinforcing and supports will be utilized throughout all construction to ensure strength and rigidity.

MODULE FABRICATION AND DESIGN

The substructure for the body will not be integral with the body but be a separate assembly. The body will be built as a separate module prior to being mounted onto the substructure.

BODY AND COMPARTMENT SUPPORT

The body will be supported by 2.00" x 2.00" x .25" wall aluminum tubing. The cross sill tubes will be spaced approximately 15.00" on center and interconnected to the body from the front to rear.

A 1.00" x 3.00" aluminum bar will be used as a stringer and will be welded to the cross sills. The stringer will be used to mount the body to the chassis frame rails. A 3.00" x .75" rubber liner will be placed on top of the chassis frame rails. The liner is used to prevent metal to metal contact where the body stringer rests on the chassis frame rails.

The body will be secured to the chassis frame by a minimum of six tie-down assemblies. Each tie-down assembly will consist of two 2.00" x 6.25" x .75" steel plates and two .50" steel rods, 14.00" long. The tie downs will be easily accessible so that the body may be removed.

The bottom of each lower compartment floor will be supported by an under slung steel angle grid. The under slung support will be constructed of .50" (13 mm) x 2.50" x 2.50" steel angle vertical supports. Horizontal members will be .38" x 2.00" x 3.00" and .38" x 2.50" x 3.50" steel angle. The compartment floors will be bolted to the under slung substructure. The support will transfer major stress to the chassis frame and not through the body.

The under slung structure will be bolted to the chassis frame rails with Grade 8 bolts. The complete substructure will be washed, primed and finish painted before being bolted to the chassis frame.

A rubber coating will be applied over the painted under slung support structure for an additional corrosion barrier.

ROOF CONSTRUCTION

The roof will be integral with the body construction. The roof will be constructed of .125" bright aluminum tread plate and supported by 2.00" square .125" wall tubing welded in place approximately 12.00" on center. The roof will be further reinforced with 2.00" square gussets welded approximately every 48.00". The roof perimeters will be constructed of a 3.00" radius extrusion with an integral drip molding. The roof extrusion will also have an

inset allowing the roof panel to be recessed into the extrusion giving further support and sealing effect at the outside edge.

The roof panel will be welded to the roof extrusions and supports. All roof seams will be continuously welded.

BODY WARRANTY

A copy of the fire apparatus manufacturer's warranty will be included with the bid. The warranty will state that the body will be free of structural failures caused by defective design or workmanship for a warranty period of **fifteen (15) years** from the date the new vehicle is first delivered **or 100,000 miles**, whichever occurs first, and that defective parts under the warranty will be repaired or replaced without charge to the original

BODY LENGTH

The length of the body will be 233.00" (5,918 mm).

BODY HEIGHT

The height of the body will be 98.00" without any roof mounted options.

ROOF CONFIGURATION

Hatch Compartments

Two (2) hatch compartments of maximum equal length will be provided on each side of the body roof.

The compartments will be 26.50" wide x 24.50" deep.

All compartment doors will hinge on the outboard side and be held open with gas cylinder struts. A chrome plated lift handle will be provided on each hatch door.

The outside walls of the compartments will be a double wall design to prevent equipment from denting the outside painted surface.

A 1.00" diameter drain will be provided in each compartment floor and will be routed to drain below the body.

A 4.00" diameter light will be mounted to the underside of each hatch door. The light will be recessed, rubber mounted, have a diffuser lens and have a shock protected bulb. Also, it will be wired to an automatic door switch and to the "open door" indicator light inside the cab.

Recessed Walkway

A recessed walkway will be centered on the roof between the hatch compartments. The walkway will not be less than 30.00" wide x 24.50" deep and will run the length of the body up to the recessed area for the light mast.

The walkway will be constructed of bright aluminum tread plate and reinforced with .125" thick, 2.00" square, aluminum tubing on 12.00" centers.

The walkway tread plate will be formed up 90 degrees, at least 2.00" on each side, to form a double .125" vertical wall for a water tight seal.

Drain holes, 1.00" in diameter, will be provided in the walkway; one (1) near the front and one (1) near the center on opposite sides. The drains will be routed to drain below the body.

A chrome plated hooded step light will be provided every four (4) feet in the walkway. The lights will be controlled by the step light switch on the rear bulkhead.

Recessed Light Mast

A transverse recessed area in the forward section of the roof, which is 12.00" deep x 52.00" wide x 88.00" long, will be provided for a light mast. The recessed area will be constructed of .125" bright aluminum tread plate with drain holes that are 1.00" in diameter in opposite corners of the recessed area. The drains will be routed to drain below the body.

ROLL-UP DOOR, SIDE COMPARTMENTS

There will be eight (8) compartment doors installed on the side compartments, double faced, aluminum construction, painted one (1) color to match the lower portion of the body and manufactured by A&A Manufacturing (Gortite).

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

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

All hinges, barrel clips and end pieces will be nylon 66. All nylon components will withstand temperatures from plus 300 to minus 40 degrees Fahrenheit.

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

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

To conserve space in the compartment(s), the spring roller assembly will not exceed 3.00" in diameter.

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

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

EXTERIOR COMPARTMENTS

The exterior compartment layout, dimensions and requirements will be minimum specifications. The doors will be able to withstand years of rugged service and wear. For this reason, the compartment door design, metal thickness and attachments will be strictly adhered to. The compartment will be constructed of .125" (3 mm)-corrosion resistant aluminum alloy, including all interior panels, floor and sides. The assemblies will be held inside fixtures while being welded.

Compartment flooring will be of the sweep out design with the floor higher than the compartment door frame. All compartments will be supported on top, rear and bottom. The rear wall of each exterior compartment will be welded to the cross sills. Drip protection will be provided over all door openings with an integral roof extrusion or aluminum extrusion.

WHEEL WELLS

The rear fenders will be an integral part of the body sides and compartments. The inside of the fender will be fitted with a full circular inner fender liner. All screws and bolts, which protrude into a compartment, will have acorn nuts attached.

LEFT FORWARD COMPARTMENTS

First Compartment

Located behind the cab will be the first compartment. The compartment dimensions will be 50.50" (1283 mm) wide x 66.88" (1699 mm) high x 26.00" (660mm) deep at the floor level. The area over the frame rails will be 50.50" (1283 mm) wide x 49.25" (1251 mm) high and will extend through to the right side of the body. The compartment door frame opening will be 48.00" (1219 mm) wide x 64.00" (1626 mm) high. The compartment clear door opening will be 45.50" (1156 mm) wide x 58.00" (1473 mm) high.

Second Compartment

Located behind the first compartment, and ahead of the rear wheels, will be the second compartment. The compartment dimensions will be 62.88" (1597 mm) wide x 66.88" (1699 mm) high x 26.00" (660mm) deep at the floor level. The area over the frame rails will be 62.88" (1597 mm) wide x 49.25" (1251 mm) high and will extend through to the right side of the body. The compartment door frame opening will be 60.00" (1524 mm) wide x 64.00" (1626 mm) high. The compartment clear door opening will be 57.50" (1461 mm) wide x 58.00" (1473 mm) high.

Compartment Loading

The first compartment will be capable of holding 1,100 pounds (499 kg). The second compartment will be capable of holding 1,400 pounds (636 kg). The area over the frame rails, in each compartment, will be capable of holding an additional 1,000 pounds (454 kg). Strain gauge test certification of the compartment loading capacities will be provided upon request.

LEFT OVER WHEEL COMPARTMENT

Located above the rear wheels will be a compartment. The compartment dimensions will be 62.50" (1588 mm) wide x 39.13" (994 mm) high. The compartment will extend through to the right side of the body. The compartment door frame opening will be 57.00" (1448 mm) wide x 36.25" (921 mm) high. The compartment clear door opening will be 54.50" (1384 mm) wide x 31.25" (794 mm) high.

Compartment Loading

The compartment will be capable of holding 1,200 pounds (545 kg). The area over the frame rails will be capable of holding an additional 1,000 pounds (454 kg).

LEFT REAR SIDE COMPARTMENT

Located behind the rear wheels will be the left rear side compartment. The compartment dimensions will be 50.50" (1283 mm) wide x 66.88" (1699 mm) high x 26.00" (660mm) deep. The compartment door frame opening will be 48.00" (1219 mm) wide x 64.00" (1626 mm) high. The compartment clear door opening will be 45.50" (1156 mm) wide x 58.00" (1473 mm) high.

Compartment Loading

The compartment will be capable of holding 1,100 pounds (499 kg).

RIGHT FORWARD COMPARTMENTS

First Compartment

Located behind the cab will be the first compartment. The compartment dimensions will be 50.50" (1283 mm) wide x 66.88" (1699 mm) high x 26.00" (660mm) deep at the floor level. The area over the frame rails will be 50.50" (1283 mm) wide x 49.25" (1251 mm) high and will extend through to the left side of the body. The compartment door frame opening will be 48.00" (1219 mm) wide x 64.00" (1626 mm) high. The compartment clear door opening will be 45.50" (1156 mm) wide x 58.00" (1473 mm) high.

Second Compartment

Located behind the first compartment, and ahead of the rear wheels, will be the second compartment. The compartment dimensions will be 62.88" (1597 mm) wide x 66.88" (1699 mm) high x 26.00" (660mm) deep at the floor level. The area over the frame rails will be 62.88" (1597 mm) wide x 49.25" (1251 mm) high and will extend through to the left side of the body. The compartment door frame opening will be 60.00" (1524 mm) wide x 64.00" (1626 mm) high. The compartment clear door opening will be 57.50" (1461 mm) wide x 58.00" (1473 mm) high.

Compartment Loading

The first compartment will be capable of holding 1,100 pounds (499 kg). The second compartment will be capable of holding 1,400 pounds (636 kg). The area over the frame rails, in each compartment, will be capable of holding an additional 1,000 pounds (454 kg). Strain gauge test certification of the compartment loading capacities will be provided upon request.

RIGHT OVER WHEEL COMPARTMENT

Located above the rear wheels will be a compartment. The compartment dimensions will be 62.50" (1588 mm) wide x 39.13" (994 mm) high. The compartment will extend through to the left side of the body. The compartment door frame opening will be 57.00" (1448 mm) wide x 36.25" (921 mm) high. The compartment clear door opening will be 54.50" (1384 mm) wide x 31.25" (794 mm) high.

Compartment Loading

The compartment will be capable of holding 1,200 pounds (545 kg). The area over the frame rails will be capable of holding an additional 1,000 pounds (454 kg).

RIGHT REAR SIDE COMPARTMENT

Located behind the rear wheels will be the right rear side compartment. The compartment dimensions will be 50.50" (1283 mm) wide x 66.88" (1699 mm) high x 26.00" (660mm) deep. The compartment door frame opening will be 48.00" (1219 mm) wide x 64.00" (1626 mm) high. The compartment clear door opening will be 45.50" (1156 mm) wide x 58.00" (1473 mm) high.

Compartment Loading

The compartment will be capable of holding 1,100 pounds (499 kg).

REAR COMPARTMENT

Roll-Up Door

A roll-up door will be installed on the rear compartment that is painted one (1) color to match the lower portion of the body. The door will be double faced aluminum construction manufactured by A&A Manufacturing (Gortite).

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

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

All hinges, barrel clips and end pieces will be nylon 66. All nylon components will withstand temperatures from plus 300 to minus 40 degrees Fahrenheit.

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

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

To conserve space in the compartments, the spring roller assembly will not exceed 3.00" in diameter.

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

A heavy-duty magnetic switch will be used for control of the interior compartment lights and the "open compartment door" warning light in the cab.

Compartment Size

The rear compartment will be 40.00" (1016 mm) wide x 67.00" (1702 mm) high x 26.00" (660 mm) deep at the floor level. The area over the frame rails will be 51.88" (1318 mm) deep. The compartment door frame opening will be 40.00" (1016 mm) wide x 64.00" (1626 mm) high. The clear door opening will be 37.50" (953 mm) wide x 58.00" (1473 mm) high.

Compartment Loading

The compartment will be capable of holding 1,000 pounds (454 kg). The area over the frame rails will be capable of holding an additional 2,000 pounds (908 kg).

Step Lights

A recessed light switch will be provided on the rear bulkhead to control two (2) step lights installed over the rear step bumper.

HITCH RECEIVER

There will be three hitch receivers provided on the apparatus. One receiver will be installed at the rear, with the remaining two located at the sides of the apparatus in front of the rear wheels through the body fender panel. The hitch receivers will be constructed of heavy steel tubing and reinforced to the apparatus framework.

Rear Receiver

The rear hitch receiver will have a Class IV rating of 10,000 pounds towing and 1000 pounds tongue weight when used with a weight distributing hitch assembly. Included with the rear receiver will be a heavy-duty slide-in tube and ball assembly held in place with a retaining pin.

Trailer Wiring

The trailer electrical connection will be a seven (7)-way flat blade recreational vehicle connector for trailer wiring compatible with electric brake systems, and a second connector with inverted ground meeting SAE J560 standards providing an auxiliary connection for warning devices.

Side Receivers

The side hitch receivers will be capable of retaining a 9,000 pound portable winch.

Stainless steel doors will be provided on the exterior of the body covering the ends of receivers in the fender area. The spring loaded hinged doors will have a flush latch provided to prevent them from opening while not in use. A stainless steel trim ring will be provided to prevent damage to the exterior finish around the opening.

Access to the side receiver pins will be provided through the compartment ahead of the receiver and through the fender liner. The liner access will have a small hinged door provided to prevent debris from entering the area of the retaining pin. The access inside the forward compartment will be provided with a rubber cover to prevent road dust from entering the compartment.

ROOF ACCESS ALUMINUM RETRACTABLE STAIR LADDER

A sliding ladder will be provided at the rear of the body to access the recessed walkway. The stair ladder will be provided with handrails and non-slip step surfaces.

The ladder will be stored in the recessed walkway when not in use and will slide out and down. In the extended position the ladder will contact the ground. The truck must be parked on a flat stable surface for the ladder to have a secure footing to the ground.

The ladder rails will be constructed of aluminum extrusions. The steps will be constructed of an aggressive non-slip aluminum step surface. Handrails constructed of aluminum will be provided to assist with climbing. There will be supports provided at the top of the ladder to minimize handrail movement while the ladder is in use. Handrails will fold down for ease of storage.

The deployed ladder will be connected to the "do not move truck" light in the cab and activate with the release of the parking brake. The ladder will be held in place with a positive mechanical lock to prevent it from deploying during transit.

The stair ladder will be approximately 144.00" long x 24.00" wide. The steps will be 8.00" deep.

There will be a handrail and a 12.00" long x 2.00" wide black nylon pull strap provided below the bottom step to aid in deploying the ladder.

UNDER BODY BAG AND CRIB COMPARTMENT

Provided under the body and ahead of the rear wheels will be one (1) under body compartment(s). The compartment(s) will be located on the DS of the body, side of the apparatus.

The compartment will be constructed of bright aluminum tread plate with an aluminum tread plate drop down door with a "D" ring handle.

Inside compartment dimensions will be 84.00" wide by 29.00" deep by 8.00" high when mounted on the driver's side. The compartment when mounted on the passenger's side will be 84.00" wide by 22.00" deep by 8.00" high.

RACK FOR AIR BAGS

Installed in compartment R1. will be a rack that will hold six (6) air bags in individual slots.

The rack will be constructed of aluminum with all mating surfaces welded in place.

The dimensions of the rack will be determined by the customer's specific requirements for the air bags to be used.

A total of one (1) will be provided.

BACKBOARD RACK

A rack constructed of four (4) storage troughs for backboard(s) will be installed in a vertical orientation in compartment D3/P3 transverse compartment against back bulk-head wall, high..

The clear trough dimensions will be back-boards are 18"W x 72"L x 2" ..

The rack will be fabricated of .125" aluminum with the exterior finished to match the compartment interior. The interior of the trough(s) will not be finished.

Access to each backboard will be provided by a semi-circle cutout in the leading edge of each trough. There will be a driver and passenger side retaining straps with hook and loop closures provided to hold the backboard(s) in place.

STOKES/STRETCHER BASKET RACK

A rack constructed of one (1) storage trough for Stokes/Stretcher Basket(s) will be installed in a horizontal orientation in compartment D3/P3 transverse compt. next to the vertical stokes rack..

The clear rack trough dimensions will be TBD.

The rack will be fabricated of .125" aluminum with the exterior finished to match the compartment interior. The interior of the trough(s) will not be finished.

There will be a driver and passenger side retaining straps with hook and loop closures provided to hold the stokes basket(s) in place.

STORAGE RACK FOR SPARE SCBA BOTTLES

A storage rack will be provided Mounted in compt. R1. to hold six (6) spare SCBA bottles. The rack will be built to hold the bottles three across by two high..

The rack will be constructed of .12 inch aluminum. The inside of the rack will be left unpainted and the outside of the rack will be painted the same color as the compartment it is installed in. The storage slots will angle to the rear of the rack to hold the bottle from falling out. A rubber bumper will be provided on the rear wall of each slot to absorb the shock of the bottle being placed into position. A scuff tape material will be applied to the inside of the slots to reduce scratching the bottles. Protection will be provided on the edge of the rack to prevent damage while loading.

The inside dimension of each bottle slot will be 7.50 inches.

STOKES BASKET RACK

Storage rack will be provided for a stokes basket.

Construction will be of .125" thick aluminum.

Paint will be provided on the outside to match that of the compartment.

No paint will be applied to the inside of the rack.

A .125" aluminum tread plate door with stainless hinge and pawl latch will be provided to retain the stokes basket.

Dimensions of the rack are 7' long x 31" wide x 10" thick..

There will be two (2) provided.

The racks will be located in the D3/P3 transverse compartment on top of the compt. towards the front. One [1] rack to be mounted horizontal, and one [1] rack to be mounted vertical..

STORAGE RACK FOR TOOL BOXES

A storage rack will be provided D1. to hold four (4) tool boxes. The rack will be built to hold the boxes 2 on top of 2..

The rack will be constructed of .12 inch aluminum. The inside of the rack will be left unpainted and the outside of the rack will be painted the same color as the compartment it is installed in. The storage slots will angle to the rear of the rack to hold the box from falling out. A rubber bumper will be provided on the rear wall of each slot to absorb the shock of the boxes being placed into position.

The inside dimension of each box slot will be 12.00 x 12.00 inches.

RECESS FOR REEL

The compartment top and hatch compartment bottom will be modified to allow three (3) reel(s) to be recessed. A removable aluminum tread plate shelf will be installed on the reel bracket providing additional storage above the reel that is accessible from the hatch compartment opening.

Recess the electric and air reels in compartments D1, D4, and P1..

SHELVING

Compartments will include shelving.

The construction will consist of .188" thick aluminum formed to provide a 2.00" high wall around the perimeter.

Corners will be welded to provide a rigid unit.

Shelving will be secured within the compartment by means of adjustable threaded fasteners. These fasteners will slide in an extruded aluminum track to provide height adjustment.

Load capacity will be 400 pounds.

There will be four (4) provided, one [1] shelf shall be installed in each of the compartments ahead of the rear wheels..

SLIDE OUT TOOLBOARD

A slide out aluminum tool board will be provided for a 26.00" side compartment.

It will be a minimum of .188" thick with .203" diameter holes in a pegboard pattern with 1.00" centers between holes.

A 1.00" x 1.00" aluminum tube frame will be welded to the edge of the pegboard.

The board will be mounted on a General Device track on the bottom to allow easy extension and retraction with a maximum tool load of 250 lb.

The slide will be mounted to a shelf type track to allow side adjustment of the tool board.

The board will have positive lock in the stowed and extended position.

There will be one (1) provided.

The tool board will be mounted in compt. D1 in the upper rear 1/3 of the compt..

SLIDE-OUT TOOLBOARD, FULL LENGTH

A slide-out aluminum tool board will be provided.

The tool board will be a minimum of .18" thick with .20" diameter holes in a pegboard pattern, on 1.00" centers. A 1" x 1" aluminum square tube frame will be welded around the perimeter of the board for additional strength.

The board will be 85.81" long and designed to be mounted in the specified location.

The board will be mounted on a small sliding tray. The construction of the tray will consist of 6061-T6 aluminum extrusions for the sides with a .18" thick aluminum floor. The corners will be welded to form a rigid unit.

The capacity rating will be 500 pounds minimum in the extended position. The slide assemblies will be manufactured with 6061-T6 aluminum extrusions. The tray will be supported by a minimum of eight (8) roller bearings each rated for a 500 pound load.

The tool board will slide-out of the compartment two thirds of its length. Positive locks for the stowed and extended position will be provided.

The tool board will be mounted to aluminum tracks to allow sideways adjustment in the mounted location

There will be one (1) provided The tool board will be mounted in the over the wheel transverse compartments in the rear 1/3 of the compartment.

SLIDE-OUT FLOOR MOUNTED TRAY

A sliding tray will be provided. The construction will consist of .18" thick aluminum formed to provide a 2.00" high wall around the perimeter. The corners will be welded to form a rigid unit.

The capacity rating will be 500 pounds minimum in the extended position. The slide mechanisms will have ball bearings for ease of operation and years of dependable service. The slide assembly will be manufactured by General Device.

An automatic lock will be provided for both the in and out tray positions. The lock trip mechanism will be located at the front of the tray and will be easily operated with a gloved hand.

The tray will be built to fit the size of the floor area where the tray is installed.

A total of nine (9) will be provided One [1] floor mounted tray shall be installed, two [2] in compartment D1, and one [1] in compts. D2, D3, and D4, two [2] in compt. P1, and one [1] in compts. P3, and P4..

TWO-WAY UTILITY TRAY

A two-way slide-out utility type tray will be provided.

The capacity rating will be 500 pounds minimum in the extended position.

Interior tray dimensions will be 85.00" long x 3.00" deep.

Tray will slide out to either side of the vehicle; two-thirds of its length.

The vertical location of the tray within the compartment will be adjustable.

The construction will consist of .188" thick aluminum for the tray bottom, and special aluminum extrusions for the tray sides, end, and tracks.

Corners will be welded to form a rigid unit.

Tray will be supported with a minimum of eight (8) ball bearing rollers; each rated for a minimum 500 pound load.

Automatic locks will be provided for both the in and out tray positions.

There will be two (2) provided.

The trays will be located in D4/P4 and D3/P3 transverse compartments..

SLIDE-OUT/TILT-DOWN TRAY

Slide-out tilt-down tray will be provided.

The capacity rating (in the extended position) will be 200 pounds minimum.

The interior tray dimensions will be approximately 22.00" long x 3.00" deep.

Approximately two-thirds of the tray will slide-out from its stored position and will tip 30 degrees down from horizontal. The vertical position within the compartment will be adjustable.

Construction will consist of .188" thick aluminum for the tray bottom and end, and special aluminum extrusions for the tray sides, front and tracks.

The tray corners will be welded for strength and rigidity.

The tray will be equipped with ball bearing rollers for smooth operation.

Two spring loaded locks will be provided at the front of the tray, one on each end.

Rubber padded stops will be provided for both the in out tray position.

There will be one (1) trays provided.

One [1] tray shall be installed in compartment D2..

REAR BUMPER

A rear bumper will be provided that is an integral part of the rear body substructure.

The bumper will be approximately 13.00" deep x 90.00" wide.

The bumper will have an aluminum tread plate deck mounted to the frame providing a stepping surface.

A kick plate will be provided above the bumper extending up on the rear bulkheads approximately 3.00"

TOW EYES

Two (2) rear painted tow eyes will be located at the rear of the apparatus and will be mounted directly to the chassis frame rails. The inner and outer edges of the tow eyes will have a radius.

RUB RAIL

Bottom edge of the side compartments will be trimmed with a bright aluminum extruded rub rail.

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

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

BODY FENDER CROWNS

Stainless steel fender crowns will be provided around the rear wheel openings. These fender crowns must be wide enough to prevent splashing onto the body from the 315/80R22.5 tires on a 30,000 lb rear axle.

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

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

REAR PULLOUT STEP

A pull-out and down (camper style) step will be installed below the tailboard step. The step surface when pulled out will lower 5.00" and will extend out from its nested position under the tailboard reducing the stepping distance from the ground to the top of the tailboard step.

This step will be 8.00" deep and designed to fit in the mounting location. The stepping surface will be bright aluminum tread plate. Slotted side support pieces of the pull-out portion of step will be made out of .25" steel plate.

::

AIR HORN SYSTEM

Two (2) Grover air horns will be provided and located, in the front bumper, recessed out-side of the frame rails.. The horn system will be piped to the air brake system wet tank utilizing 0.38" tubing. A pressure protection valve will be installed in-line to prevent loss of air in the air brake system.

ELECTRICAL HARNESSING INSTALLATION

All 12-volt wiring and harnessing installed by the apparatus manufacturer will conform to specification PM-QA W-101: Pierce manufacturing Wiring Harness Specification.

To ensure rugged dependability, all wiring harnesses installed by the apparatus manufacturer will conform to the following specifications:

SAE J1128 - Low tension primary cable

SAE J1292 - Automobile, truck, truck-tractor, trailer and motor coach wiring

SAE J163 - Low tension wiring and cable terminals and splice clips

SAE J2202 - Heavy duty wiring systems for on-highway trucks

NFPA 1901 - Standard for automotive fire apparatus

FMVSS 302 - Flammability of interior materials for passenger cars, multipurpose passenger vehicles, trucks and buses

SAE J1939 - Serial communications protocol

SAE J2030 - Heavy-duty electrical connector performance standard

SAE J2223 - Connections for on board vehicle electrical wiring harnesses

NEC - National Electrical Code

SAE J561 - Electrical terminals - Eyelet and spade type

SAE J928 - Electrical terminals - Pin and receptacle type A

For increased reliability and harness integrity, harnesses will be routed throughout the cab and chassis in a manner which allows the harnessing to be laid into its mounting location. Routing of harnessing which requires pulling of wires through tubes will not be allowed.

Wiring will be run in loom or conduit where exposed, and have grommets or other edge protection where wires pass through metal. Wiring will be color, function and number coded. Wire colors will be integral to each wire insulator and run the entire length of each wire. Harnessing containing multiple wires and uses a single wire color for all wires will not be allowed. Function and number codes will be continuously imprinted on all wiring harness conductors at 2.00" intervals. All wiring installed between the cab and into doors will be protected by an expandable rubber boot to protect the wiring. Exterior exposed wire connectors will be positive locking, and environmentally sealed to withstand elements such as temperature extremes, moisture and automotive fluids. Electrical wiring and equipment will be installed utilizing the following guidelines:

1. All wire ends not placed into connectors will be sealed with a heat shrink end cap. Wires without a terminating connector or sealed end cap will not be allowed.
2. All holes made in the roof will be caulked with silicon. Large fender washers, liberally caulked, will be used when fastening equipment to the underside of the cab roof.
3. Any electrical component that is installed in an exposed area will be mounted in a manner that will not allow moisture to accumulate in it. Exposed area will be defined as any location outside of the cab or body.

4. For low cost of ownership, electrical components designed to be removed for maintenance will be quickly accessible. For ease of use, a coil of wire will be provided behind the appliance to allow them to be pulled away from the mounting area for inspection and service work.
5. Corrosion preventative compound will be applied to non-waterproof electrical connectors located outside of the cab or body. All non-waterproof connections will require this compound in the plug to prevent corrosion and for easy separation of the plug.
6. Any lights containing non-waterproof sockets in a weather-exposed area will have corrosion preventative compound added to the socket terminal area.
7. All electrical terminals in exposed areas will have DOW 1890 protective Coating applied completely over the metal portion of the terminal.
8. Rubber coated metal clamps will be used to support wire harnessing and battery cables routed along the chassis frame rails.
9. Heat shields will be used to protect harnessing in areas where high temperatures exist. Harnessing passing near the engine exhaust will be protected by a heat shield.
10. Cab and crew cab harnessing will not be routed through enclosed metal tubing. Dedicated wire routing channels will be used to protect harnessing therefore improving the overall integrity of the vehicle electrical system. The design of the cab will allow for easy routing of additional wiring and easy access to existing wiring.
11. All braided wire harnesses will have a permanent label attached for easy identification of the harness part number and fabrication date.
12. All standard wiring entering or exiting the cab will be routed through sealed bulkhead connectors to protect against water intrusion into the cab.

BATTERY CABLE INSTALLATION

All 12-volt battery cables and battery cable harnessing installed by the apparatus manufacturer will conform to the following requirements:

SAE J1127 - Battery Cable

SAE J561 - Electrical terminals, eyelets and spade type

SAE J562 - Nonmetallic loom

SAE J836A - Automotive metallurgical joining

SAE J1292 - Automotive truck, truck-tractor, trailer and motor coach wiring

NFPA 1901 - Standard for automotive fire apparatus

Battery cables and battery cable harnessing will be installed utilizing the following guidelines:

1. All battery cables and battery harnesses will have a permanent label attached for easy identification of the harness part number and fabrication date.
2. Splices will not be allowed on battery cables or battery cable harnesses.
3. For ease of identification and simplified use, battery cables will be color coded. All positive battery cables will be red in color or wrapped in red loom the entire length of the cable. All negative battery cables will be black in color.
4. For ease of identification, all positive battery cable isolated studs throughout the cab and chassis will be red in color.

5. For increased reliability and reduced maintenance, all electrical buss bars located on the exterior of the apparatus will be coated to prevent corrosion.

ELECTRICAL COMPONENT INSTALLATION

All lighting used on the apparatus will be, at a minimum, a two (2) wire light grounded through a wired connection to the battery system. Lights using an apparatus metal structure for grounding will not be allowed.

An operational test will be conducted to ensure that any equipment that is permanently attached to the electrical system is properly connected and in working order. The results of the tests will be recorded and provided to the purchaser at time of delivery.

ELECTRONIC SIREN AUXILIARY

A FTS Mobile Electronics, Powercall, Model 6-Adam, 200-watt electronic siren with noise canceling microphone will be provided and installed in the upper control panel..

REAR FMVSS LIGHTING

The rear stop/tail and directional LED lighting will consist of the following:

Two (2) Whelen model 60R00XRR red LED stop/tail lights.

Two (2) Whelen model 60A00TAR amber LED arrow turn lights .

Each light will be installed separately at the rear with a flange.

Four (4) red reflectors will be provided.

A Weldon, Model 23882-2600-00, license plate bracket will be mounted on the driver's side above the warning lights. A Weldon, Model 9186-23882-30, step lamp will illuminate the license plate.

Two (2) Whelen, Model: 60J000CR, backup lights, with flange, will be provided.

Both lights will be installed with 6E or 64 flange kit.

REAR ID/MARKER DOT LIGHTING

There will be one (1) Truck-Lite Model 15050R three (3) LED light kit used as identification lights located at the rear of the apparatus per the following:

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

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

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

- To be visible from the rear.

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

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

Per FMVSS 108 and CMVSS 108 requirements.

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

LIGHT, INTERMEDIATE

There will be two (2) Weldon, Model 9186-8580-29, amber, LED, turn signal, marker lights furnished, one (1) each side, in the rear fender panel.

SPEAKER

There will be two (2) speakers provided. Each speaker will be a Whelen, Model SA122FMA, cast aluminum, 100-watt, flange mount with natural aluminum finish. Each speaker will be connected to the siren amplifier.

"DO NOT MOVE APPARATUS" INDICATOR

A flashing red indicator light, located in the driving compartment, will be illuminated automatically per the current NFPA requirements. The light will be labeled "Do Not Move Apparatus If Light Is On."

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

The speaker(s) will be recessed in the front bumper on the driver's side.

DO NOT MOVE TRUCK MESSAGES

Messages will be displayed on the gauge panel LCD located forward of the steering wheel directly in front of the driver whenever the Do Not Move Truck light is active. The messages will designate the item or items not in the stowed for vehicle travel position (parking brake disengaged).

The following messages will be displayed (where applicable):

Do Not Move Truck

DS Cab Door Open (Driver Side Cab Door Open)

PS Cab Door Open (Passenger's Side Cab Door Open)

DS Crew Cab Door Open (Driver Side Crew Cab Door Open)

PS Crew Cab Door Open (Passenger's Side Crew Cab Door Open)

DS Body Door Open (Driver Side Body Door Open)
PS Body Door Open (Passenger's Side Body Door Open)
Rear Body Door Open
DS Ladder Rack Down (Driver Side Ladder Rack Down)
PS Ladder Rack Down (Passenger Side Ladder Rack Down)
Deck Gun Not Stowed
Lt Tower Not Stowed (Light Tower Not Stowed)
Hatch Door Open
Fold Tank Not Stowed (Fold-A-Tank Not Stowed)
Aerial Not Stowed (Aerial Device Not Stowed)
Stabilizer Not Stowed
Steps Not Stowed
Handrail Not Stowed

Any other device that is opened, extended, or deployed that creates a hazard or is likely to cause major damage to the apparatus if the apparatus is moved will be displayed as a caution message after the parking brake is disengaged.

COMPARTMENT LIGHTING

There shall be eight (8) compartments with ROM LED compartment light strips. There shall be two (2) strip lights installed vertically in each compartment, one (1) each side of the compartment door opening. The lights shall be provided in compartments in all compartments..

Two (2) strip lights will be installed vertically, one (1) each side of the compartment door opening.

The remaining compartments will include 6.00" diameter Truck-Lite, Model: 79384, lights in each enclosed compartment. Each light will have a number 1076 one filament, two wire bulb.

Opening the compartment door, will automatically turn the compartment lighting on.

CAB PERIMETER SCENE LIGHTS

There will be four (4) Truck-lite, Model 44308C, 4.00" white LED lights with Model 40700 grommets provided for the cab and crew cab doors.

These lights will be activated automatically when the battery switch is on and the exit doors are opened or by the same means as the body perimeter scene lights.

PERIMETER SCENE LIGHTS, BODY

There will be two (2) Truck-lite, Model 44308C, 4.00" white LED, lights with Model 40700 grommets provided under the rear step area. The lights will be spaced one (1) each side of apparatus and have a clear lens.

The perimeter scene lights will be activated by a parking brake.

REAR SCENE LIGHTS

There will be two (2) Whelen, Model 9SC0ENZR LED scene light(s) with chrome flange installed at the rear of the truck, Rear Bulkhead..

A control for the light(s) selected above will be the following:

a switch at the driver's side switch panel

a switch at the passenger's side switch panel

a switch at the command switch panel located in the body

no additional switch location

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

SIDE SCENE LIGHTS

There will be four (4) Whelen, Model 9SC0ENZR LED scene light(s) with chrome flange installed on the side of the apparatus, two [2] each side of body..

A control for the light(s) selected above will be the following:

a switch at the driver's side switch panel

a switch at the passenger's side switch panel

no additional switch location

no additional switch location

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

12 VOLT LIGHTING

There will be two (2) Whelen Pioneer PFP2, 12 volt LED floodlight(s) provided on the front visor, one (1) on the driver's side and one (1) on the passenger's side.

The light will be controlled by the following:

a switch at the driver's side switch panel

a switch at the passenger's side switch panel

no additional switch location

These light(s) may be load managed when the parking brake is set.

GROUND LIGHTS

A pair of Whelen, Model 90E00ZCR, halogen lights will be provided at the rear of the body.

The lights will be mounted in a 13 degree bezel and no more than 7 feet off the ground.

The lights will be activated when the parking brake is activated.

WARNING LIGHTS (Cab Face)

Four (4) Whelen Model M6* LED flashing warning lights will be installed on the cab face, above the headlights, mounted in a common bezel.

The driver's side front outside warning light to be red.

The driver's side front inside warning light to be blue.

The passenger's side front inside warning light to be blue.

The passenger's side front outside warning light to be red.

All four (4) lights will include a colored lens that is the same color of the LED's.

All four (4) lights will be controlled by a lighted switch in the cab on the switch panel.

The inside lights may be load managed if colored or disabled if white, when the parking brake is set.

PORTABLE HAND LIGHTS, PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2009 edition, section 10.5.2 requires two portable hand lights mounted in brackets fastened to the apparatus.

The hand lights are not on the apparatus as manufactured. The fire department will provide and mount these hand lights.

HAND HELD SPOTLIGHT

Additional hand lights will be provided. Each light will be a Streamlight, Model Survivor 12v LED flashlight. A charger will be provided with each light.

A total of eight (8) lights will be provided.

The light(s) will be installed Each light and charger will be mounted at each seat location in truck..

VIDEO SYSTEM, REAR CAMERA & 7.00" LCD DISPLAY

A Safety Vision video system with color rear view camera with built in microphone, activated with the reverse signal, and 7.00" LCD display monitor with swivel mount located in view of the driver on the overhead panel will be provided.

The following components will be supplied:

- One (1) SV-CLCD70B 7" Color LCD
- One (1) SV-ILCB In-line control box
- One (1) SV-620A Color camera

All necessary cables

FRONT WARNING LIGHT

One (1) Whelen 4500 series FFX4520, 20.00" LED light bar will be provided on the front of the cab, centered beneath the cab windshield, on the lift up service hood.

This light bar will include the following:

- Two (2) red 400 LINEAR12 LED modules facing forward, one each side.
- One (1) white 400 LINEAR12 LED module facing forward, in the center.
- Two (2) red LINZ6 LED angled corner warning light, one (1) on each end.

These lights will be activated with the front warning switch.

The flash pattern will be controlled by two (2) external Whelen ULF28 solid state flashers. The DS and the PS red forward facing LED will alternate with the DS and PS red corner LED and the white center LED.

The lens colors will be all clear.

To meet the NFPA requirements the colored warning lights may be load managed and the white lights will be disabled when the parking brake is applied.

AIR HORN CONTROL

The air horns will be actuated by two (2) foot switches, one (1) located on the officer's side and one (1) on the driver's side.

Electronic siren head will be recessed in the driver side and passenger side center switch panels.

MECHANICAL SIREN, (Auxiliary)

A Federal Q2B siren will be furnished. A siren brake button will be installed on the switch panel.

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

The mechanical siren will be recessed in the front bumper in the center. The siren will be properly supported using the bumper framework.

The mechanical siren will be actuated by two (2) foot switches, one (1) located on the officer's side and one (1) on the driver's side.

LIGHTBAR

There will be one (1) 88.00" Whelen Freedom, Model FN**QLED, LED light bar mounted on the cab roof.

The light bar will include the following:

- Six (6) red flashing LED modules facing forward.
- Two (2) white flashing LED modules facing forward.
- Two (2) red flashing corner LED modules, one in each front corner.
- One (1) red flashing LED module facing the driver side.
- One (1) red flashing LED module facing the passenger side side.
- One (1) GTT Model 795 LED Opticom™, traffic light controller with National standard priority.

The color of the lenses will be clear.

There will be two (2) switches located on a cab switch panel to control this lightbar.

- One (1) switch will control all the warning lights.
- One (1) switch will control the traffic light controller.

The white warning lights and the traffic light controller will be disabled when the parking brake is set.

This traffic directing light will be surface mounted with a tread plate box at the rear of the apparatus as high as practical.

The traffic directing light control head will be located in the driver side overhead switch panel in the center panel position.

HEADLIGHT FLASHER

The high beam headlights will flash alternately between the left and right side, with a control switch located on the cab instrument panel.

The flashing will automatically cancel when the headlight switch is activated or when the parking brake is set.

SIDE ZONE LOWER LIGHTING

Six (6) Whelen model 60*02F*R flashing "Super" LED lights will be located at the following positions:

Two (2) lights, one (1) each side on the front cab corner - red Super LED/red lens each side.

Two (2) lights, on the side of the below the crew cab window. - blue Super LED/blue lens each side.

Two (2) lights, on the rear fender panels underneath compts. D2 and P2. - red Super LED/red lens each side.

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

These lights will be installed with three (3) pairs of flange kits.

INTERIOR CAB DOOR WARNING LIGHTS

Four (4) Whelen 500 LED flashing lights will be provided. One (1) light will be located inside of each cab and crew cab door pan. Each light will be activated by the door jam switch of the associated door. The color of the lights will be blue. The lights will alternately flash whenever the corresponding door is open. These lights will be mounted in a Whelen flange.

REAR ZONE LOWER LIGHTING

Two (2) Whelen model 60*02F*R flashing "Super" LED warning lights will be located at the rear of the apparatus, required to meet or exceed the lower level optical warning and optical power requirements of NFPA.

The color of these lights will be red Super LED/red lens.

One (1) switch in the cab on the switch panel will control these lights.

These lights will be installed with a flange.

WARNING LIGHTS (Rear)

There will be two (2) Whelen Model M9* LED flashing warning light(s) with bezel(s) provided on the upper rear of the body outside of the scene lights..

The color of these light(s) will be red.

These light(s) will be controlled with the rear upper warning switch.

These light(s) will include a lens that is the same color as the LED's.

WARNING LIGHTS (Rear and Side upper zones)

Eight (8) Whelen Super LED lights will be provided to meet the NFPA upper zone B, C and D lighting requirements:

The following lights will be provided at the rear upper bulkhead, facing the rear of the truck (Upper zone C):

One (1) Whelen model 90**5FR Super LED light each side as high and as far to the outside as practical, and will be provided with flange kit

The color of these lights will be red Super LED/red lens

Two (2) Whelen model 70*02F*R Super LED lights located Rear Bulkhead. and will be

provided with 7E flange Kit

The color of these lights will be red Super LED/red lens

The following lights will be provided at the front and rear side upper corners of the side sheet facing the side of the truck (Upper zone B and D):

Two (2) Whelen model 90**5FR Super LED lights and will be provided with a flange

These lights will be:

red SuperLED/red lens each side

red Super LED/red lens each side

Per NFPA, the lights will be switched on by a lighted switch on the instrument panel and all lights will be active whenever the switch is on.

TRAFFIC DIRECTING LIGHT

There will be one (1) Whelen model TAM65, 36.00" long x 2.84" high x 2.24" deep, amber LED traffic directing light installed at the rear of the apparatus.

The Whelen model TACTLD1 control head will be included with this installation.

The auxiliary warning mode will be activated with the control head only.

ELECTRICAL SYSTEM GENERAL DESIGN for ALTERNATING CURRENT

The following guidelines will apply to the 120/240 VAC system installation:

General

Any fixed line voltage power source producing alternating current (ac) line voltage will produce electric power at 60 cycles plus or minus five (5) cycles.

Except where superseded by the requirements of NFPA 1901, all components, equipment and installation procedures will conform to NFPA 70, National Electrical Code (herein referred to as the NEC).

Line voltage electrical system equipment and materials included on the apparatus will be listed and installed in accordance with the manufacturer's instructions. All products will be used only in the manner for which they have been listed.

Grounding

Grounding will be in accordance with Section 250-6 "Portable and Vehicle Mounted Generators" of the NEC. Ungrounded systems will not be used. Only stranded or braided copper conductors will be used for grounding and bonding.

An equipment grounding means will be provided in accordance with Section 250-91 (Grounding Conductor Material) of the NEC.

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 the NEC.

In addition to the bonding required for the low voltage return current, each body and driving or crew compartment enclosure will be bonded to the vehicle frame by a copper conductor. This conductor will have a minimum ampere rating of 115 percent of the nameplate current rating of the power source specification label as defined in Section 310-15 (amp capacities) of the NEC. A single conductor properly sized to meet the low voltage and line voltage requirements will be permitted to be used.

All power source system mechanical and electrical components will be sized to support the continuous duty nameplate rating of the power source.

Operation

Instructions that provide the operator with the essential power source operating instructions, including the power-up and power-down sequence, will be permanently attached to the apparatus at any point where such operations can take place.

Provisions will be made for quickly and easily placing the power source into operation. The control will be marked to indicate when it is correctly positioned for power source operation. Any control device used in the drive train will be equipped with a means to prevent the unintentional movement of the control device from its set position.

A power source specification label will be permanently attached to the apparatus near the operator's control station. The label will provide the operator with the information detailed in Figure 19-4.10.

Direct drive (PTO) and portable generator installations will comply with Article 445 (Generators) of the NEC.

Overcurrent protection

The conductors used in the power supply assembly between the output terminals of the power source and the main over current protection device will not exceed 144 inches. (3658 mm) in length.

For fixed power supplies, all conductors in the power supply assembly will be type THHW, THW, or use stranded conductors enclosed in nonmetallic liquid tight flexible conduit rated for a minimum of 194 degrees Fahrenheit (90 degrees Celsius).

For portable power supplies, conductors located between the power source and the line side of the main overcurrent protection device will be type SO or type SEO with suffix WA flexible cord rated for 600-volts at 194 degrees Fahrenheit (90 degrees Celsius).

Wiring Methods

Fixed wiring systems will be limited to the following:

- Metallic or nonmetallic liquid tight flexible conduit rated at not less than 194 degrees Fahrenheit (90 degrees Celsius)

or

- Type SO or Type SEO cord with a WA suffix, rated at 600 volts at not less than 194 degrees Fahrenheit (90 degrees Celsius)

Electrical cord or conduit will not be attached to chassis suspension components, water or fuel lines, air or air brake lines, fire pump piping, hydraulic lines, exhaust system components, or low voltage wiring. In addition the wiring will be run as follows:

- Separated by a minimum of 12 inches (305 mm), or properly shielded, from exhaust piping

- Separated from fuel lines by a minimum of six (6) inches (152 mm) distance.

Electrical cord or conduit will be supported within six (6) inches (152 mm) of any junction box and at a minimum of every 24 inches (610 mm) of continuous run. Supports will be made of nonmetallic materials or corrosion protected metal. All supports will be of a design that does not cut or abrade the conduit or cable and will be mechanically fastened to the vehicle.

Wiring Identification

All line voltage conductors located in the main panel board will be individually and permanently identified. The identification will reference the wiring schematic or indicate the final termination point. When prewiring for future power sources or devices, the unterminated ends will be labeled showing function and wire size.

Wet Locations

All wet location receptacle outlets and inlet devices, including those on hardwired remote power distribution boxes, will be of the grounding type provided with a wet location cover and installed in accordance with Section 210-7 "Receptacles and Cord Connections" of the NEC.

All receptacles located in a wet location will be not less than 24 inches (610 mm) from the ground. Receptacles on off-road vehicles will be a minimum of 30 inches (762 mm) from the ground.

The face of any wet location receptacle will be installed in a plane from vertical to not more than 45 degrees off vertical. No receptacle will be installed in a face up position.

Dry Locations

All receptacles located in a dry location will be of the grounding type. Receptacles will be not less than 30 inches (762 mm) above the interior floor height.

All receptacles will be marked with the type of line voltage (120-volts or 240-volts) and the current rating in amps. If the receptacles are direct current, or other than single phase, they will be so marked.

Listing

All receptacles and electrical inlet devices will be listed to UL 498, Standard for Safety Attachment Plugs and Receptacles, or other appropriate performance standards. Receptacles used for direct current voltages will be rated for the appropriate service.

Electrical System Testing

The wiring and associated equipment will be tested by the apparatus manufacturer or the installer of the line voltage system.

The wiring and permanently connected devices and equipment will be subjected to a dielectric voltage withstand test of 900 volts for one (1) minute. The test will be conducted between live parts and the neutral conductor, and between live parts and the vehicle frame with any switches in the circuit(s) closed. This test will be conducted after all body work has been completed.

Electrical polarity verification will be made of all permanently wired equipment and receptacles to determine that connections have been properly made.

Operational Test per Current NFPA 1901 Standards

The apparatus manufacturer will perform the following operation test and ensure that the power source and any devices that are attached to the line voltage electrical system are properly connected and in working order. The test will be witnessed and the results certified by Underwriters Laboratories.

The prime mover will be started from a cold start condition and the line voltage electrical system loaded to 100 percent of the nameplate rating.

The power source will be operated at 100 percent of its nameplate voltage for a minimum of two (2) hours unless the system meets category certification as defined in the current NFPA 1901 standard.

Where the line voltage power is derived from the vehicle's low voltage system, the minimum continuous electrical load as defined in the current NFPA 1901 standard will be applied to the low voltage electrical system during the operational test.

ONAN 35KW SINGLE PHASE GENERATOR

The apparatus will be equipped with a complete electrical power system. The wiring and generator installation will conform to the present National Electrical Code Standards of the National Fire Protection Association. The installation will be designed for continuous operation without overheating and undue stress on components.

The generator will be a single phase, four (4)-wire, Onan 35kW driven by a transmission "power takeoff" attached to the side of the transmission.

Generator performance will meet the American National Standards Institute (ANSI) C84.1-1982 voltage requirement as utilized from the receptacle.

Generator will have a built in automatic voltage control.

Generator will have a NEMA MG21 rating.

- Continuous Duty Rating: 35,000 watts
- Phase: Single
- Nominal Cycles: 60 hertz

- Nominal Amp Rating: 145 at 240-volts
- Engine Speed at Engagement: Idle
- Engine Speed Engaged: 1100/1400 rpm range
- Generator RPM: 1800 rpm

The output of the generator will be controlled by an electronic governor. The truck engine will be programmed so the generator's output is at 60 hertz.

The main chassis transmission PTO will power the generator. A stainless steel splash guard will be installed to reduce the amount of road spray on this frame-mounted generator.

The generator will be operable in the stationary mode with a shift control located inside the cab with an indicator light to note engagement. For safety, the automatic high idle will be activated through interlocks only after the chassis parking brake control is in the park position, the generator PTO transmission has made a complete shift and the truck transmission is in neutral.

An electric/hydraulic valve will supply hydraulic fluid to the clutch engagement unit provided on the chassis PTO drive.

To properly monitor the generator performance and load demands during operation, the generator will be equipped with a full instrument and control package. This panel will be mounted adjacent to the load center. The following instruments will be installed in the panel:

- One (1) Voltmeter
- Two (2) Ammeters
- One (1) Frequency Meter
- One (1) Hour Meter
- One (1) "Power On" Green Indicator Light
- One (1) PTO Engagement Indicator Light
- Two (2) Fuse Holders: With two (2) amp fuses for gauge protection

The meter and indicators will be installed near eye level in the compartment. Instruments will be flush mounted in an appropriate sized weatherproof electrical enclosure. All instruments used will be accurate within +/- two (2) percent.

The system will be installed by highly qualified electrical technicians to assure the required level of safety and protection to the fire apparatus operators. The wiring, electrical fixtures and components will be to the highest industry quality standards available on the domestic market. The equipment will be the type designed for mobile installations subject to vibration, moisture and severe continuous usage.

All electrical wiring from the load center will be fine stranded copper S.O. type with a 600 volt jacket. The wire will be sized to the load and circuit breaker rating. The wire size will be ten (10)-gauge on 30 amp circuits, 12-gauge on 20 amp circuits and 14-gauge on 15 amp circuits. The S.O. cable will be run in corner areas and extruded aluminum pathways built into the body for easy access. Any S.O. cord not run in an enclosed raceway or cable tray will have an additional abrasion resistant covering.

The main load center will have circuit breakers rated to load demand.

Individual breakers will be provided for all receptacles to isolate a tripped breaker from affecting any other on-line equipment.

GENERATOR LOCATION

The generator will be mounted under the body between the frame rails.

GENERATOR START

A switch will be located on the cab instrument panel to engage the generator.

CIRCUIT BREAKER PANEL

The circuit breaker panel will be located in compartment D1..

GENERATOR SPLASH GUARD

A stainless steel splash guard will be installed to reduce the amount of road spray on a frame mounted PTO generator.

240 VOLT LIGHTING

A Will-Burt Night Scan Powerlite elevated lighting system, model NS 4.5-9000 OPT, will be provided.

Mast will operate with a 12 volt DC control and 20 psi regulated air from the chassis air system.

All electrical cables will be internal of the mast for better protection.

Control for the mast and the lighting system will be a hand held wired remote unit. It will be operable with a single hand for turn/tilt, up/down, and on/off. Length of the control cord will be 25 feet. The mast will automatically stow and the lights will automatically nest when the down switch is activated. The remote will be located in compartment D4..

Weight of the unit will not exceed 180 pounds.

Six (6), 1,500 watt, 240-volt AC quartz halogen OPTIMUM lights will be mounted on the mast in a weatherproof directional lighting system that will have the ability to rotate 385 degrees and tilt 330 degrees. The light heads will have a split tilt function, where the left and right sides can tilt independently in different directions or together in the same direction.

A "do not move truck" warning indicator will activate in the cab when the mast is out of the nested position.

A label will be provided at the operator's location to indicate mast operation instructions, warning information, extended tower height from the ground and bulb replacement data.

TOWER "LOOK UP" LIGHT

A self contained 12 volt flood light will be provided on the light tower. The light will turn on automatically when the tower is raised and turn off when the tower is lowered.

The light will be in the front, top of the body..

A total of one (1) light tower light masts will be provided.

TOWER OVERHEAD DETECTOR

A Will-Burt model D-TEC II overhead detector will be included on the vertical light tower.

LIGHT MAST ALARM

When the light mast is in the up position and the parking brake is released, the truck horn will be activated as an alarm.

TOWER STROBE LIGHT

A self contained strobe light with green lens will be provided on the top of the light tower.

This light will be controlled by a switch located on the tower control panel.

ELECTRIC CORD REEL

Furnished with the 120 volt AC electrical system will be a Hannay, series 1600, cord reel. The reel will be provided with a 12-volt electric rewind switch, that is guarded to prevent accidental operation and labeled for its intended use. The switch will be protected with a fuse and installed at a height not to exceed 72 inches above the operators standing position.

The exterior finish of the reel(s) will be painted #269 gray from the reel manufacturer..

A captive roller assembly to be provided to aid in the payout and loading of the reel. A ball stop will be provided to prevent the cord from being wound on the reel.

A label will be provided in a readily visible location adjacent to the reel. The label will indicate current rating, current type, phase, voltage and total cable length.

A total of two (2) cord reels will be provided One [1] reel to exit into compt. D4 from the hatch compt. and one [1] reel to exit into compt. P4 from the hatch compt..

The cord reel will be configured with three (3) conductors.

CORD

Provided for electric distribution will be one (1) length installed on the reel of 200 feet of yellow 10/3 electrical cord, weather resistant 105 degree C to -50 degree C, 600 volt jacketed SOOW cord. A Hubbell L5-20, 20 amp, 120 volt, twist lock connector body will be installed on the end of the cord.

PORTABLE JUNCTION BOX

There will be four (4)-120 vac, 20 amp, twist lock (L5-20R) receptacles, and a locator/indicator light provided in an outlet box. The junction box construction will be weatherproof and have flip-up covers lined with soft neoprene rubber at each outlet opening. The junction box will be a Circle-D, model PF-51 G.

A Hubbell L5-20, 20 amp, 120 volt, twist lock connector body.

A total of two (2) will be provided.

REEL ENCLOSURE

An aluminum tread plate enclosure will be installed over the reel. The enclosure will be provided with a stainless steel hinge that will allow the cover to be opened.

A captive roller assembly will be provided to assist with the payout of the cord. A ball stop will be provided on the cord to stop the cord at the roller assembly.

A total of three (3) will be installed over the reels in the hatch compts..

20 AMP RECEPTACLE

Wired to the power supply will be four (4) receptacles that are a 120 volt 20 amp three wire twist-lock NEMA L5-20 type with weather resisting cover located one [1] each side in the rear fender panels and one [1] each side on the rear bulk head..

120 VOLT INTERIOR RECEPTACLE

Receptacle will be a NEMA 5-20, 120 volt, 20 amp, three (3) wire duplex household type with a non-weather resistant cover connected to the generator.

There will be four (4) receptacles provided.

One each side of the command desk in the D/S interior, and one each in the cabinets of the body interior. These receptacles will run thru the auto transfer..

KUSSMAUL AUTO EJECT FOR SHORELINE

two (2) shoreline receptacles will be provided to operate the dedicated 120-volt circuits on the truck without the use of the generator.

The shoreline receptacle (s) will be provided with a NEMA 5-20, 120 volt, 20 amp, straight blade Kussmaul Super auto eject plug with a red weatherproof cover. The cover is spring loaded to close, preventing water from entering when the shoreline is not connected.

The unit is completely sealed to prevent road dirt contamination.

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

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

The shoreline will be connected to the battery conditioner and transfer switch..

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

The shoreline receptacle will be located on the driver side of cab, above wheel.

SUB FEED CIRCUIT BREAKER BOX (shoreline)

A Cutler Hammer sub feed box will be supplied to protect the on board circuits when an auxiliary power source is used.

The box will be installed in the in the drivers side rear compartment D1..

The sub feed box will distribute power to specific circuits in the vehicle.

A directory for each breaker will be provided adjacent to the circuit breaker panel.

Identification of circuits will be done in a durable manner that provides years of service.

SWITCH, AUTO TRANSFER

To protect either the generator or external power source from back feed, an automatic relay system will be installed to switch the on line device between the generator and the external power source when it is connected for use.

The transfer switch will power all of the body interior lights and receptacles..

HYDRAULIC HOSE

A 31'-40' section of Hurst Low Pressure twin hose will be provided.

The hose will be one (1) continuous length, without unions, and equipped with a quick disconnect fittings on one end and swivel fittings at the opposite end.

The colors of the hose will be:

hose 1 blue/blue

hose 2 orange/orange

hose 3 no hose required

hose 4 no hose required

hose 5 no hose required

hose 6 no hose required

A total of two (2) will be provided.

The hose will be located from the front bumper reels to the hydraulic power supply's in compt. D1..

HYDRAULIC REEL INSTALLED IN THE BUMPER EXTENSION

A hydraulic hose reel will be provided in the front bumper extension. The reel will be operated by a 12 volt electric motor controlled by a rewind switch. The motor will be protected by a circuit breaker and the rewind circuit will be protected by a fuse. The switch will be guarded to prevent accidental operation

The reel capacity will be a minimum of 100 feet of .25" I.D. dual hydraulic hose. Surfaces where the hose comes in contact with the reel roller will be constructed of stainless steel, chrome plated steel or plastic.

The reel will be protected from the weather by an aluminum treadplate enclosure. The top will be hinged and have a pneumatic arm on the inside to hold the cover open while the reel is being used. The bottom portion of the enclosure will be removable. A captive roller assembly to be provided to aid in the payout and loading of the reel. A ball stop and rewind switch will also be provided.

A label will be provided in a readily visible location adjacent to the reel. The label will indicate maximum flow pressure and total cable length.

A total quantity of two (2) reels will be provided.

The brand, model and age of tool being used with this hose will be Hurst..

HYDRAULIC REEL MOUNTING PROVISION

Brackets and the appropriate wiring will be provided for the mounting of a customer installed Hurst dual hose. hydraulic reel.

A total of two (2) reels will be installed by the customer two [2] reels to be mounted in hatch compt. over compt. D1..

HYDRAULIC SPREADER TOOL MOUNTING

Bracketry will be installed for the mounting of a hydraulic spreader tool front bumper tray between the reels.. All bracketry will be of aluminum construction and bolted in place for strength and easy removal of tools. A bracket that holds the tool in a horizontal orientation will be installed for each spreader for a total of one (1).

Tools are Hurst..

HYDRAULIC CUTTER TOOL MOUNTING

Bracketry will be installed for the mounting of a hydraulic cutter tool front bumper tray between the reels.. All bracketry will be of aluminum construction and bolted in place for strength and easy removal of tools. A bracket that holds the tool in a horizontal orientation will be installed for each cutter for a total of one (1).

Tools are Hurst..

LOOSE EQUIPMENT

The following equipment will be furnished with the completed unit:

- One (1) bag of chrome, stainless steel, or cadmium plated screws, nuts, bolts and washers, as used in the construction of the unit.

NFPA REQUIRED LOOSE EQUIPMENT, PROVIDED BY FIRE DEPARTMENT

The following loose equipment as outlined in NFPA 1901, 2009 edition, section 10.5.1 will be provided by the fire department. All loose equipment will be installed on the apparatus before placed in emergency service, unless the fire department waives NFPA section 4.21.

- One (1) SCBA complying with NFPA 1981, *Standard on Open-Circuit Self-Contained Breathing Apparatus for Fire and Emergency Services*, for each assigned seating position, but not fewer than two (2), mounted in brackets fastened to the apparatus or stored in containers supplied by the SCBA manufacturer.

- One (1) spare SCBA cylinder for each SCBA carried, each mounted in a bracket fastened to the apparatus or stored in a specially designed storage space(s).

- One (1) first aid kit.

- One (1) traffic vest for each seating position, each vest to comply with ANSI/ISEA 207, *Standard for High Visibility Public Safety Vests*, and have a five-point breakaway feature that includes two at the shoulders, two at the sides, and one at the front.

- Five (5) fluorescent orange traffic cones not less than 28" (711 mm) in height, each equipped with a 6" (152 mm) retro-reflective white band no more than 4" (102 mm) from the top of the cone, and an additional 4" (102 mm) retro-reflective white band 2" (51 mm) below the 6" (152 mm) band.

- Five (5) illuminated warning devices such as highway flares, unless the five fluorescent orange traffic cones have illuminating capabilities.

- One automatic external defibrillator (AED).

DRY CHEMICAL EXTINGUISHER PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2009 edition, section 10.5.2 requires one (1) approved dry chemical portable fire extinguisher with a minimum 80-B:C rating mounted in a bracket fastened to the apparatus.

The extinguisher is not on the apparatus as manufactured. The fire department will provide and mount the extinguisher.

WATER EXTINGUISHER PROVIDED BY FIRE DEPARTMENT

NFPA 1901, 2009 edition, section 10.5.2 requires one (1) 2.5 gallon or larger water extinguisher mounted in a bracket fastened to the apparatus.

The extinguisher is not on the apparatus as manufactured. The fire department will provide and mount the extinguisher.

PAINT - BODY PAINTED TO MATCH CAB

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

1. Manual Surface Preparation - All exposed metal surfaces on the custom body will be thoroughly cleaned and prepared for painting. Surfaces that will not be painted include all chrome plated, polished stainless steel, anodized aluminum and bright aluminum treadplate. Each imperfection on the exterior metal surface will be removed or filled and then sanded smooth for a smooth appearance. All seams will be sealed before painting.
2. Chemical Cleaning and Treatment - The aluminum surfaces will be properly cleaned using a 4-phase, high pressure and high temperature acid etching system. All steel surfaces will be properly treated using a 3-phase, high temperature, cleaning/phosphatizing system. Surfaces are chemically cleaned to remove all dirt, oil, grease and metal oxides to ensure the subsequent coatings bond well. An ultra pure water final rinse of 25 parts per million solids or less, will be applied to final rinse all metal surfaces at the conclusion of the metal treatment process. This final rinse ensures all chemical residues are removed and that no minerals, (salts), from the water dry onto the metal surface and remain under the primers and topcoats. These salts can lead to blistering and under film corrosion.
3. Primer/Surfacer Coats - A minimum of two (2) mil dry, (.002), of two component urethane primer/surfacer will be hand applied to the chemically treated metal surfaces to provide a strong corrosion protective base coat and to smooth out the surface. The primer is a high solids and low VOC paint.
4. Hand Sanding to Ultra Fine Finish The primer/surfacer coat is lightly sanded with mild abrasive paper to an ultra smooth finish. This hand finish process is critical to produce the smooth mirror like finish in the topcoat.
5. Sealer Primer Coat A two- (2) component sealer primer coat is applied over the sanded primer to again build toward the final smooth finish. This layer of primer sealer also gives additional corrosion protection.
6. Topcoat Paint Two (2) coats of an automotive grade, two component acrylic urethane paint are applied to provide the lasting beauty and durability. The acrylic urethane topcoat contains a clear coat resin chemistry that creates the high gloss and depth of image. This type of topcoat provides the best resistance against acid rain and other more common chemicals.
7. Clearcoat - Two (2) coats of an automotive grade two (2) component urethane will be applied. Lap style doors will be clear coated to match the body. Roll-up doors will not be clear coated and the standard roll-up door warranty will apply.

A cyclic corrosion test, (General Motors test GM-9540), of 40 cycles will be required before making changes to the exterior coating process. Exterior coating systems, (excluding the undercarriage components), must achieve a 1/16 or less maximum creep from the scribe for aluminum and an 1/8 or less maximum creep from the scribe for galvanneal after 40 cycles in the General Motors GM-9540 test.

Each batch of color topcoat, together with the finish painted vehicle, is tested for precise color match. Visual color match will be checked following ASTM D-1729, (American

Standard Testing Methods), procedures using CIE, (International Commission on Illumination), D75 Northern Daylight light source. Instrumental color match will follow ASMT D-2244 procedures with a maximum delta E of 1.0 for whites, 1.4 for yellows, blues, greens and 1.5 for reds.

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

The cab and body shall be two-tone, with the upper section painted #10 pierce white along with a shield design on the cab face and lower section of the cab and body painted red..

PAINT - ENVIRONMENTAL IMPACT

Contractor will meet or exceed all current State (his) regulations concerning paint operations. Pollution control will include measures to protect the atmosphere, water and soil. Controls will include the following conditions:

- Topcoats and primers will be chrome and lead free.
- Metal treatment chemicals will be chrome free. The wastewater generated in the metal treatment process will be treated on-site to remove any other heavy metals.
- Particulate emission collection from sanding operations must have a 99.99% efficiency factor.
- Particulate emissions from painting operations will be collected by a dry filter or water wash process. If the dry filter means is used, it must have an efficiency rating of 98.00%. Water wash systems will be 99.97% efficient.
- Water from water wash booths will be reused. Solids will be removed mechanically on a continual basis to keep the water clean.
- Paint wastes are disposed of in an environmentally safe manner. They are used as fuel in kilns used in the cement manufacturing process - thereby extracting energy from a waste material.
- Empty metal paint containers will be cleaned, crushed and recycled to recover the metal.
- Solvents used in clean-up operations will be collected, recycled on-site, or sent off-site for distillation and returned for reuse. Residue from the distillation operation will be used as fuel in off-site cement kilns.

Additionally, the finished apparatus will not be manufactured with or contain products that have ozone depleting substances. Contractor will, upon demand, present evidence that his manufacturing facility meets the above conditions and that it is in compliance with his State EPA rules and regulations.

PAINT CHASSIS FRAME ASSEMBLY

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

PAINT, REAR WHEELS

All wheel surfaces, inside and outside of inboard steel wheels only, will be provided with powder coat paint #101 black.

PAINT, COMPARTMENT INTERIOR

The compartment interior will be painted with a gray spatter finish for ease of cleaning and to make it easier to touch up scratches and nicks.

REFLECTIVE BAND

A 10.00" white reflective band will be provided across the front of the vehicle and along the sides of the body.

The reflective band provided on the cab face will be below the headlights on the fiberglass.

CHEVRON STRIPING, REAR

There will be alternating chevron striping located on the rear-facing vertical surface of the apparatus. Covered surfaces will include the exterior rear wall. Rear compartment doors, entry doors, or walkway areas will not be covered.

The colors will be red and yellow diamond grade.

Each stripe will be 6.00" in width.

This will meet the requirements of NFPA 1901, 2009 edition, which states that 50% of the rear surface will be covered with chevron striping.

"Z" RIBBON IN REFLECTIVE STRIPE

"Z" type ribbon(s) will be added to the reflective stripe on D3 and P3 as shown on the LSP drawing.. Areas adjacent to the "Z" portion of the stripe will be shaded and highlighted with an air brush to give it a ribbon affect. There will be one (1) pair on the vehicle.

CHEVRON, INVERTED "V" STRIPING ON CAB AND CREW CAB DOORS

There will be alternating chevron striping located on the inside of each cab and crew cab door.

The striping will consist of the following colors:

The first color will be yellow

The second color will be red (tomato red)

The size of the striping will be 4.00".

GOLD LEAF STRIPE, BODY

A gold leaf stripe will be provided on each side of the body, located along the top of the side compartmentation.

STRIPE, CAB FACE AND SIDES

A gold leaf stripe will be provided on the paint break. The stripe will be on both sides of the cab and on the cab face.

LETTERING

The lettering will be totally encapsulated between two (2) layers of clear vinyl.

LETTERING

Forty-one (41) to sixty (60) genuine gold leaf lettering, 3.00" high, outlining and shading will be provided.

WEB SITE ADDRESS LETTERING, REFLECTIVE

There will be a two (2) pair of web site addresses, in 1.00" to 2.00" reflective lettering, installed on compartments D1 and P1..

REFLECTIVE LETTERING

20 letters 14.00" high gold reflective letter(s), with shading and an outline, will be installed on the upper sides of the body..

CAB GRILLE DESIGN

A R1 design will be painted on the cab grille.

EMBLEM

There will be two (2) 42.00" high "Jaws of Live" emblem/s supplied and installed on compt. doors D1 and P1. The emblem/s will be made with white reflective vinyl and will include black outline.

ENGINE WARRANTY

A five (5) year limited engine warranty will be provided. A limited warranty certificate, WA0180, is included with this proposal.

FIFTY (50) YEAR STRUCTURAL INTEGRITY

A custom chassis frame limited warranty certificate, WA0013, is included with this proposal.

FRONT AXLE TWO (2) YEAR MATERIAL AND WORKMANSHIP WARRANTY

A Meritor axle limited warranty certificate, WA0046, is included with this proposal.

FIVE (5) YEAR MATERIAL AND WORKMANSHIP

An electronics limited warranty certificate, WA0014, is included with this proposal.

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TRANSMISSION COOLER WARRANTY

The Champ transmission cooler will carry a five (5) year parts and labor warranty (exclusive to the transmission cooler). In addition, a collateral damage warranty will also be in effect for the first three (3) years of the Champ warranty coverage and will not exceed \$10,000 per occurrence. A limited warranty certificate, WA0186, is included with this proposal.

FIFTEEN (15) YEAR STRUCTURAL INTEGRITY

A heavy duty rescue apparatus body limited warranty certificate, WA0010, is included with this proposal.

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TEN (10) YEAR PRO-RATED PAINT AND CORROSION

A cab limited pro-rated paint warranty certificate, WA0055, is included with this proposal.

TEN (10) YEAR PRO-RATED PAINT AND CORROSION

A body limited pro-rated paint warranty certificate, WA0057, is included with this proposal.

THREE (3) YEAR MATERIAL AND WORKMANSHIP

The Goldstar gold leaf lamination limited warranty limited warranty certificate, WA0018, is included with this proposal.

ENGINE INSTALLATION CERTIFICATION

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

CAB INTEGRITY CERTIFICATION

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

- European Occupant Protection Standard ECE Regulation No.29.
- SAE J2422 Cab Roof Strength Evaluation - Quasi-Static Loading Heavy Trucks.
- SAE J2420 COE Frontal Strength Evaluation - Dynamic Loading Heavy Trucks.
- Roof Crush

The cab will be subjected to a roof crush force of 22,050 lbs. This value meets the ECE 29 criteria and is equivalent to the front axle rating up to a maximum of 10 metric tons.

- Additional Roof Crush

The same cab will be subjected to a roof crush force of 100,000 lbs. This value exceeds the ECE 29 criteria by nearly 4.5 times.

- Side Impact

The same cab will be subjected to dynamic preload where a 13,275 lb moving barrier slams into the side of the cab at 5.5 mph at a force of 13,000 ft-lbs. This test is part of the SAE J2422 test procedure and more closely represents the forces a cab will see in a rollover incident.

- Frontal Impact

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

- Additional Frontal Impact

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

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

CAB DOOR DURABILITY CERTIFICATION

Robust cab doors help protect occupants. Cab doors will survive a 200,000 cycle door slam test where the slamming force exceeds 20 G's of deceleration. The bidder will certify that the sample doors similar to those provided on the apparatus have been tested and have met these criteria without structural damage, latch malfunction, or significant component wear.

WINDSHIELD WIPER DURABILITY CERTIFICATION

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

ELECTRIC WINDOW DURABILITY CERTIFICATION

Cab window roll-up systems can cause maintenance problems if not designed for long service life. The window regulator design will complete 30,000 complete up-down cycles and still function normally when finished. The bidder will certify that sample doors and windows similar to those provided on the apparatus have been tested and have met these criteria without malfunction or significant component wear.

SEAT BELT ANCHOR STRENGTH

Seat belt attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat belt anchor design will withstand 3000 lb of pull on both the lap and shoulder belt in accordance with FMVSS 571.210 Seat Belt Assembly Anchorages. The bidder will certify that each anchor design was pull tested to the required force and met the appropriate criteria.

SEAT MOUNTING STRENGTH

Seat attachment strength is regulated by Federal Motor Vehicle Safety Standards and should be validated through testing. Each seat mounting design will be tested to withstand 20 G's of force in accordance with FMVSS 571.207 Seating Systems. The bidder will certify that each seat mount and cab structure design was pull tested to the required force and met the appropriate criteria.

CAB DEFROSTER CERTIFICATION

Visibility during inclement weather is essential to safe apparatus performance. The defroster system will clear the required windshield zones in accordance with SAE J381 *Windshield Defrosting Systems Test Procedure And Performance Requirements - Trucks, Buses, And Multipurpose Vehicles*. The bidder will certify that the defrost system design has been tested in a cold chamber and passes the SAE J381 criteria.

CAB HEATER CERTIFICATION

Good cab heat performance and regulation provides a more effective working environment for personnel, whether in-transit, or at a scene. The cab heaters will warm the cab 75 F from a cold-soak, within 30 minutes when tested using the coolant supply methods found in SAE J381. The bidder will certify that a substantially similar cab has been tested and has met these criteria.